BE (E&TC) – Mobile Communication

Multiple Choice Questions (MCQ)

Unit I - Switching techniques for Voice and Data

1) If ‘n’ number of users are present in a network with point-to-point links, then how many links will be required in the network?
a. n (n – 1)
b. n (n – 1) / 2
c. n (n – 1) / 4
d. n (n – 1) / 8
ANSWER: (b) n (n – 1) / 2

2) Which among the following is/are adopted by cross bar systems with hard wired control subsystem?
a. Relays
b. Latches
c. Both a and b
d. None of the above
ANSWER: (c) Both a and b

3) Which kind of switching technique indicates the transfer of coded values from input to output during the same interval of time?
a. Space Switching
b. Time Switching
c. Combination Switching
d. None of the above
ANSWER: (a) Space Switching

4) What is the hardware, used to establish connection as an electrical path between inlet and outlet pair in switching system, known as?
a. Switching Matrix
b. Switching Network
c. Both a and b
d. None of the above
ANSWER: (c) Both a and b

5) In folded type of network, ____
a. input lines are folded back to output lines
b. output lines are folded back to input lines
c. input lines are folded back to themselves (input lines)
d. output lines are folded back to themselves (output lines)
ANSWER: (b) output lines are folded back to input lines

6) The ratio of number of successful calls to the number of call attempts is known as _____
a. Call Completion Rate (CCR)
b. Call Block Rate (CBR)
c. Busy Hour Call Rate (BHCR)
d. None of the above
ANSWER: (a) Call Completion Rate (CCR)

7) If a telephone exchange serves 1500 users with the average BHCA of about 9000 and CCR is about 50%, what would be the busy hour calling rate?
a. 2
b. 3
c. 4.5
d. 5
ANSWER: (b) 3

8) How is the relation between Erlang and CCS specified?
a. 1 Erlang = 36 CCS
b. 1 Erlang = 56 CCS
c. 1 Erlang = 76 CCS
d. 1 Erlang = 96 CCS
ANSWER: (a) 1 Erlang = 36 CCS

9) Percentage of occupancy can be defined as the percentage of _____ for which the server seems to be busy.
a. speed
b. distance
c. time
d. volume

ANSWER: (c) time

10) By which name/s is the Grade of Service (GOS) well-known?
a. Call congestion
b. Time congestion
c. Both a and b
d. None of the above
ANSWER: (a) Call congestion

11) Which among the following provides TRG access to outgoing junctions through the two stage network?
a. Expander
b. Distributor
c. Concentrator
d. Router
ANSWER: (d) Router

12) Which shape of switches are not adopted normally due to non-usability of both way trunks?
a. Circular
b. Triangular
c. Hexagonal
d. Square
ANSWER: (b) Triangular

13) In graded groups, switches with inaccessibility to the outgoing route gets ____ into the number of separate groups.
a. added
b. subtracted
c. multiplied
d. divided
ANSWER: (c) multiplied

14) Which form/s of grading design has/have the tendency to share every trunk between equal number of groups?
a. Homogeneous Grading
b. Heterogeneous Grading

c. Skipped Grading
d. All of the above
ANSWER: (a) Homogeneous Grading

15) For the two-group grading consisting of 14 trunks, availability = 5, A_k = 1.4E and the required grade of service of about 0.01, what would be its traffic capacity?
a. 4.98 E
b. 6.72 E
c. 8.3 E
d. 10 E
ANSWER: (a) 4.98 E

16) Which among the following controls the dynamic characteristics of Phase Locked Loop (PLL)?
a. Low Pass Filter
b. High Pass Filter
c. Band Pass Filter
d. Band Stop Filter
ANSWER: (a) Low Pass Filter

17) After the application of line frequency in Phase Locked Loop (PLL), at which stage do/ does the VCO frequency start to exhibit variation?
a. Free running
b. Capture
c. Phase Lock
d. All of the above
ANSWER: (b) Capture

18) What is an acceptable value of dividing point between the wander and jitter?
a. 10 Hz
b. 20 Hz
c. 50 Hz
d. 200 Hz
ANSWER:(a) 10 Hz

19) If the voltage controlled by VCO exhibits variation at faster and rapid rate, then the instability of clock is known as _____
a. Clock wander
b. Clock jitter
c. Clock frequency
d. Clock period
ANSWER: (b) Clock jitter

20) Which theorem in random jitter specifies the composite effect of various uncorrelated noise sources despite the distribution approaches to Gaussian distribution?
a. Initial Value Theorem
b. Final Value Theorem
c. Central Limit Theorem
d. None of the above
ANSWER: (c) Central Limit Theorem

21) Which type of data network supports the interconnection of computers within highly populated area?
a. LAN
b. WAN
c. MAN
d. None of the above
ANSWER: (c) MAN

22) Which among the following is/are supported by LAN?
a. PABX
b. PSTN
c. SBDN
d. All of the above
ANSWER: (a) PABX

23) If the voice channel is free in PSTN, then what would be the maximum data rate supported by 3.1 kHz bandwidth of voice channel?
a. 2000 bps
b. 4000 bps
c. 6000 bps
d. 8000 bps

ANSWER: (c) 6000 bps

24) In Phase Shift Keying, how many bit/s is/are allowed to be transmitted per shift?
a. 1
b. 2
c. 4
d. 8
ANSWER: (b) 2

25) Which among the following utilizes the transmission line upto 85 – 95 %?
a. Voice Traffic
b. Data Traffic
c. Both a and b
d. None of the above
ANSWER: (a) Voice Traffic

26) If the system is designed with the usage of hexagonal-shaped cells, how are the base-stations located?
a. At the centre of cell
b. At the edge of cell
c. At the corner of the cell
d. All of the above
ANSWER: (d) All of the above

27) Which antennas are used at the center of the cells for the system with hexagonal-shaped cells?
a. Omni-directional antennas
b. Sectored directional antennas
c. Both a and b
d. None of the above
ANSWER: (a) Omni-directional antennas

28) In a cellular telephone system, which type of interference results from imperfect design of filters in receivers by allowing nearby frequencies to enter the receiver?
a. Co-channel Interference
b. Adjacent-channel Interference

c. Both a and b
d. None of the above
ANSWER: (b) Adjacent-channel Interference

29) Which effect is widespread in adjacent-channel interference especially after the reception of a weak signal by a mobile user from the base-station?
a. Near-far effect
b. Doppler's effect
c. Capture effect
d. Kendall effect
ANSWER: (a) Near-far effect

30) Which method of cellular network assists in minimizing the co-channel interference associated with the angle of degree?
a. Cell Splitting
b. Cell Sectoring
c. Cell Segmentation & Dualization
d. None of the above
ANSWER: (b) Cell Sectoring

31) Which type of connection takes place between an incoming trunk and an outgoing trunk?
a. Local call
b. Outgoing call
c. Incoming call
d. Transit call
ANSWER: (d) Transit call

32) In message switching system, an incoming message gets ____ especially if the required route is busy.
a. lost
b. stored in a queue & retransmitted
c. sampled
d. recovered
ANSWER: (b) stored in a queue & retransmitted
33) Which type of switching network involves the establishment of a dedicated path between two stations?

a. Message Switching
b. Packet Switching
c. Circuit Switching
d. Manual Switching
ANSWER: (c) Circuit Switching

34) In packet switching, what does the header of each short size of packet consist of?
a. Source address
b. Destination address
c. Intermediate nodes
d. All of the above
ANSWER: (d) All of the above

35) In manual switching, which kind of battery exchange has the provision of subscribers set along with magneto generator?
a. Local battery exchange
b. Central battery exchange
c. Both a and b
d. None of the above
ANSWER: (a) Local battery exchange

36) If a group of trunk is offered 1200 calls during the busy hour & 20 calls are lost along with the average call duration of about 7 min, then what would be the total duration of congestion period?
a. 21.6 sec
b. 42.2 sec
c. 57.6 sec
d. 98.2 sec
ANSWER: (c) 57.6 sec

37) In analyzing the traffic performance, how is the number of trunk decided with the provision of the Grade of Service (GoS) especially for larger group?
a. By normal load condition
b. By overload condition
c. By underload condition
d. None of the above
ANSWER: (b) By overload condition

38) If the queuing systems are connected in tandem configuration, what would be the nature of delay?
a. Commutative
b. Distributive
c. Cumulative
d. Deductive
ANSWER: (c) Cumulative

39) Which type of holding time distribution is assumed for the voice conversation on telephone?
a. Constant
b. Exponential
c. Both a and b
d. None of the above
ANSWER: (b) Exponential

40) Which model of loss system allows the usage of Poisson distribution model for traffic analysis especially by assuming infinite number of users?
a. Lost Calls Cleared (LCC)
b. Lost Calls Returned (LCR)
c. Lost Calls Held (LCH)
d. None of the above
ANSWER: (a) Lost Calls Cleared (LCC)

41) In two-stage network, which phenomenon/situation occurs due to impossible connectivity of given incoming trunk to selected outgoing trunk specifically because of link utilization for other connection between primary and secondary switches?
a. Bursting
b. Blinking
c. Blocking
d. Burning
ANSWER: (c) Blocking

42) Which kind of switching system does not comprise any subscriber, concentrator or expander?

a. Crossbar
b. Director Exchange
c. Strowger
d. Tandem
ANSWER: (d) Tandem

43) By how many times does the time division exchange exhibit connection and disconnection with respect to every millisecond, due to its ability of using rearrangeable networks?
a. 2
b. 4
c. 8
d. 16
ANSWER: (c) 8

44) Which signals are regarded as call-progress signals as they are sent back to inform the caller about the progress of the call?
a. Address Signals
b. Status Signals
c. Call request Signals
d. Answer Signals
ANSWER: (b) Status Signals

45) Which among the following exhibit/s the necessity of trunks during the signaling mechanism?
a. Inchannel Signaling
b. Common Channel Signaling
c. Both a and b
d. None of the above
ANSWER: (a) Inchannel Signaling

46) Phase jitter is generated by an additive noise on a _____sinusoidal wave.
a. continuous
b. sampled
c. discrete
d. distorted
ANSWER: (a) continuous

47) What is /are the purpose/s of pulse stuffing in an asynchronous multiplexing?
a. Removal of slips & the need for clock synchronization
b. Usability of output channel with higher rate than input
c. Creation of timing adjustments
d. All of the above
ANSWER: (d) All of the above

48) In digital network synchronization, which approach indicates the cost burden carrying of highly accurate and redundant timing sources by means of smaller switching nodes?
a. Packetization
b. Master Slave Clocking
c. Network Wide Pulse Stuffing
d. Plesiochronous Network
ANSWER: (d) Plesiochronous Network

49) If the desired connection has a low completion probability, which type of flow control technique is used for eliminating the capture of common resources?
a. Trunk Directionalization
b. Cancellation of Alternate Routing
c. Code Blocking
d. Centralized Connection Control
ANSWER: (d) Centralized Connection Control

50) In network management, managing the rate at which the traffic enters a network is known as _____
a. Flow control
b. Routing control
c. Data control
d. All of the above
ANSWER: (a) Flow control

51) Which among the following can be adopted as a dedicated path between the source and destination in circuit switching?

a. Physical Wire
b. Radio Link
c. Co-axial Cable
d. All of the above
ANSWER: (d) All of the above

52) The transfer of user messages from node to another by means of store and forward switching network is known as _____
a. jitter
b. scaling
c. hop
d. entity
ANSWER: (c) hop

53) Consider the statements given below. Which among them represents the operational step executed in datagram Packet Switched Network?
a. Fixed Path is assigned between nodes from source to destination
b. First Come First Serviced basis is applicable
c. Necessity of an identifier for a connection between source host & destination host
d. Transmission of short messages of one or two packet length
ANSWER: (d) Transmission of short messages of one or two packet lengths

54) In Protocol Data Units (PDUs), where do/does the data get/s interchanged?
a. Between peer entities
b. Between entities of neighboring layers
c. Between ‘N’ & ‘N+1’ layers
d. All of the above
ANSWER: (a) Between peer entities

55) Which type of framing technique/s reduce/s the problem of synchronization of the receiver?
a. Character Count
b. Character Stuffing
c. Bit Stuffing
d. All of the above
ANSWER: (b) Character Stuffing

56) If more number of cells are necessary in the frequency reuse distance, then the segmentation & dualization techniques get _____
a. united
b. divided
c. restricted
d. filtered
ANSWER: (a) united

57) Which hand-off stage deals with the relinquishment of unnecessary frequency channels by keeping the availability for other mobile users?
a. Initialization
b. Resource Reservation
c. Call Execution
d. Call Completion
ANSWER: (d) Call Completion

58) Which among the following represents the flawless hand-off with no perceivable interruption of service?
a. Hard hand-off
b. Soft hand-off
c. Intracell hand-off
d. Intercell hand-off
ANSWER: (b) Soft hand-off

59) In cellular telephone network, which component controls the switching between public wireline telephone network and the base station of cells for supporting the different calls between landline to mobile, mobile to landline and mobile to mobile calls?
a. Electronic Switching Center (ESC)
b. A Cell Controller
c. Radio Transmitter & Receiver
d. A common communication protocol
ANSWER: (a) Electronic Switching Center (ESC)

60) In Electronic Switching Centre (ESC), the transmission rate of X.25 protocol is ____9.6 Kbps.
a. Less than
b. Equal to

c. Greater than
d. None of the above
ANSWER: (c) Greater than

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ANSWER: d. Transit call

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b. divided
c. restricted
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ANSWER: a. united

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c. Greater than
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ANSWER: c. Greater than

BE (E&TC) – Mobile Communication

Multiple Choice Questions (MCQ)

Unit II - Traffic Engineering and Signalling

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ANSWER: c. 57.6 sec

Explanation:
No explanation is available for this question!

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d. None of the above
ANSWER: a. Lost Calls Cleared (LCC)

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ANSWER: b. Exponential

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b. Time congestion
c. Both a and b
d. None of the above
Answer Explanation
ANSWER: Call congestion

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b. distance
c. time
d. volume
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8. How is the relation between Erlang and CCS specified?
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d. 1 Erlang = 96 CCS
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a. 2
b. 3
c. 4.5
d. 5
ANSWER: b. 3

10. The ratio of number of successful calls to the number of call attempts is known as _____
a. Call Completion Rate (CCR)
b. Call Block Rate (CBR)
c. Busy Hour Call Rate (BHCR)
d. None of the above
ANSWER: a. Call Completion Rate (CCR)

11. In International Telephone Numbering, a digit or combination of digits characterizing the called numbering area within a country is called _____ code.
a. Local

b. CCITT
c. Baudot
d. Area
View Answer:
Answer: Option D

Solution:

12. The last two digits of the loaded cable designation 22E66 indicates
a. Spacing
b. Coil inductance
c. Wire gauge
d. Attenuation
View Answer:
Answer: Option B

Solution:

13. A condition of a telephone handset, in which it can be called, is _____ condition.
a. On-hook
b. Off-hook
c. Busy
d. None of these
View Answer:
Answer: Option A

Solution:

14. When digits 3 is dialed using touch tone system, the amount of time needed to send the tone is
a. 0.1 sec
b. 50 msec
c. 0.25 sec
d. 0.25 sec
View Answer:
Answer: Option B

Solution:

15. A telephone number perform the following operations except
a. To route the call
b. To activate the necessary apparatus for proper call charging
c. To order clearing of connection
d. None of the above
View Answer:
Answer: Option C

Solution:

16. The number to be dialed or called to reach a subscriber in the same local network or numbering area is
a. Local code
b. Area code
c. Toll access code
d. Subscriber No.
View Answer:
Answer: Option D

Solution:

17. That part of the telephone network between the telephone instrument at the subscriber premises and the central office equipment is called the _____.
a. Inter-office trunk
b. Tie line
c. Subscriber loop
d. Service drop wire
View Answer:
Answer: Option C

Solution:

18. A line linking telephone central offices is called _____ line.
a. Tie
b. Inter-office trunk
c. Routing
d. Connector
View Answer:
Answer: Option B

Solution:

19. A signalling technique wherein a number of voice paths is carried over one common channel instead of having individual voice channels.
a. In band signalling
b. Out of band signalling
c. Common channel signalling
d. Alternate channel signalling

View Answer:
Answer: Option C

Solution:

20. _____ is a unit of telephone traffic defined as one user making a call of one second duration.
a. CCS
b. Call-second
c. Erlangs
d. Call-hour
View Answer:
Answer: Option B

Solution:

21. During a busy hour in a telephone system an average of one call is lost, then the grade of service is considered to be:
a. 1.01
b. 10%
c. 0.10%
d. 0.01
View Answer:
Answer: Option D

Solution:

22. If a busy counts are made during the span of 15 minutes, and the average number of occupied circuit is found to be 8, then the traffic, in Erlang, is:
a. 2
b. 8
c. 6
d. 4
View Answer:
Answer: Option A

Solution:

23. In a standard CCITT group, 12 channels FDM, the carrier frequency of the channel No. 1 is _____.
a. 100 kHz
b. 102 kHz
c. 108 kHz
d. 60 kHz
View Answer:
Answer: Option C

Solution:

24. In the FDM hierarchy, a mastergroup is composed of ten supergroups and is equivalent to

a. 600 channels
b. 60 channels
c. 180 channels
d. 120 channels
View Answer:
Answer: Option A

Solution:

25. The approximation process in PCM creates noise called:
a. Thermal
b. White noise
c. Quantizing noise
d. Agitation noise
View Answer:
Answer: Option C

Solution:

26. The criteria to be considered in designing a telephone system
a. Attenuation limit
b. Resistance limit
c. A or B
d. A and B
View Answer:
Answer: Option D

Solution:

27. This refers to loop AC reference frequency measured in decibels
a. Signalling limits
b. Resistance limits
c. Attenuation limits
d. All of these
View Answer:
Answer: Option C

Solution:

28. An inuction coil which is multiple winding transformer intended to interface a 2-wire circuit to be a 4-wire circuit to permit two-way transmission of signals.
a. Hybrid function
b. Speech transformer
c. Transmission regulation circuit
d. A or B

View Answer:
Answer: Option D

Solution:

29. A subscriber loop signalling method in which signalling information is indicated by the presence and absence of a battery and ground condition on the line at the called end of the trunk.
a. Wet-Dry
b. Reverse Battery
c. High-Low
d. Supervisory
View Answer:
Answer: Option A

Solution:

30. An arrangement where the only possible connection between a number of exchanges is through a single tandem or transit exchange where they are all connected.
a. Mesh
b. Star
c. Composite
d. Ring
View Answer:
Answer: Option B

Solution:

31. CCITT recommendation E-161 recommends that not more than _____ digits make up an international number, excluding the international prefix.
a. 10
b. 12
c. 16
d. 20
View Answer:
Answer: Option B

Solution:

32. The following are the transmission media used for telephone systems except:
a. Parallel wire
b. Coaxial wire
c. Fiber optics
d. None of these
View Answer:
Answer: Option D

Solution:

33. The subscriber loop provides the following except:
a. Talk battery
b. Ringing voltage
c. Telephone dial
d. Current during on hook
View Answer:
Answer: Option D

Solution:

34. A method of multiplexing in which the total frequency spectrum available is used by each channel, but not part of the time.
a. FDM
b. TDM
c. SDM
d. GSM
View Answer:
Answer: Option B

Solution:

35. The primary cause of echo and singing is
a. Intermodulation noise
b. Crosstalk
c. Impedance mismatch
d. Thermal noise
View Answer:
Answer: Option C

Solution:

36. For crosstalk to be considered intelligible, at least _____ words are intelligible to the listener in a seven second period.
a. 5
b. 6
c. 4
d. 3
View Answer:
Answer: Option C

Solution:

37. Noise that is non-continuous, consisting of irregular pulse or noise spikes of short duration and of relatively high amplitude.

a. Solar
b. Intermodulation
c. Impulse
d. Crosstalk
View Answer:
Answer: Option C

Solution:

38. The signal to noise ratio for voice based on customer satisfaction is
a. 30 db
b. 35 db
c. 15 db
d. 20 db
View Answer:
Answer: Option A

Solution:

39. dBa is a noise unit which uses a tone of 1000 Hz and a power level of
a. -85 dBm
b. -90 dBm
c. 85 dBm
d. -80 dBm

View Answer:
Answer: Option A

Solution:

40. The average intensity in one or more traffic paths occupied in the busy hour by one 2-minute call for an aggregate duration of two minutes.
a. CCS
b. Cm
c. Erlang
d. EBHC
View Answer:
Answer: Option D

Solution:

41. A method of handling lost calls wherein a call failing to immediately find a server, waits enters a queue until one becomes available.
a. Lost Calls Cleared
b. Lost Calls Held
c. Lost Calls Delayed

d. None of these
View Answer:
Answer: Option C

Solution:

42. The main terminal used as cross connection point for cables 300 pairs and above.
a. MTTC
b. MDF
c. DP
d. TTC
View Answer:
Answer: Option B

Solution:

43. For PCM, the sampling theorem states that the sampling frequency must be _____ the highest frequency contained in the analog signal.
a. twice
b. more than twice
c. less than twice
d. equal to
View Answer:
Answer: Option B

Solution:

44. a group of sixty voice channels with bandwidth of 240 kHz is called a
a. group
b. supergroup
c. mastergroup
d. jumbogroup
View Answer:
Answer: Option B

Solution:

45. On the subscriber’s telephone set employing the touch tone technique, how many signals are transmitted to the telephone exchange for every button that is pressed?
a. 2 VHF signals
b. 1 VHF and 1 AF
c. 2 AF tones
d. 16 AF tones
View Answer:
Answer: Option C

Solution:

46. An electronic circuit which is inserted into the 4-wire trunk path effectively to block the passage of reflected signal energy
a. Echo suppressor
b. Loading coil
c. Loop extender
d. Telephone amplifier
View Answer:
Answer: Option A

Solution:

47. The following are signalling functions except:
a. Ringing signals
b. Address signals
c. Supervisory signals
d. None of these
View Answer:
Answer: Option D

Solution:

48. The standard spacing for 19-D-88 cable loading code is
a. 700 ft.
b. 6000 ft.
c. 4500 ft.
d. 3000 ft.
View Answer:
Answer: Option C

Solution:

49. A telephone exchange has a subscriber loop limit of 1800 ohms, excluding the telephone instrument. What is the farthest distance, in miles, that a subscriber can be located away from the telephone exchange, if AWG 26 cable, which has a resistance of 431 ohms/loop mile, is used?
a. 5.95
b. 8.18
c. 3.9
d. 4.18
View Answer:
Answer: Option D

Solution:

50. The Strowger or step-by-step system falls under what type of switching control system?

a. Manual
b. Progressive
c. Common
d. Automatic
View Answer:
Answer: Option B

Solution:

51. For building telephone facilities, the size of entrance conduit shall not be less than _____ in diameter.
a. 30 mm
b. 50 mm
c. 60 mm
d. 75 mm
View Answer:
Answer: Option B

Solution:

52. In telephony, tone dialing takes _____ time than pulse dialing.
a. Less
b. More
c. About the same
d. Can’t be determined
View Answer:
Answer: Option A

Solution:

53. A telephone service wherein calls are rerouted into a preassigned station is called _____.
a. Camp-On
b. Call Forwarding
c. Call Barring
d. Abbreviated Dialing
View Answer:
Answer: Option B

Solution:

54. What type of control system crossbar switches are operating?
a. Manual
b. Progressive
c. Common
d. Automatic
View Answer:

Answer: Option C

Solution:

55. PABX stands for
a. Private All-purpose Broadcasting Exchange
b. Private Automatic Branch Exchange
c. Public Access Bidirectional Exchange
d. Public Address Broadcasting Exchange
View Answer:
Answer: Option B

Solution:

56. A trunk is
a. The base of a communication tower
b. A telephone line connecting two C.O.'s
c. A line connecting one telephone set to the PABX
d. The structure where antenna are attached
View Answer:
Answer: Option B

Solution:

57. The voice frequency channel pass band is:
a. 0 to 4000 Hz
b. 300 to 3000 Hz
c. To carry only speech
d. All of the preceding
View Answer:
Answer: Option A

Solution:

58. What is used to transmit more than one conversation over a path?
a. Hybrid
b. Tandem
c. Multiplexing
d. All of the above
View Answer:
Answer: Option C

Solution:

59. The common channel interoffice signalling method
a. Uses the same channel for signalling as for the related conversation

b. Is used on local loops
c. Uses a separate channel for signalling only
d. Comes the signalling for one related conversation
View Answer:
Answer: Option C

Solution:

60. Telephone switching is accomplished by
a. Manual Switchboard
b. Step-by-step Switches
c. Crossbar switches
d. Any of the these
View Answer:
Answer: Option D

61. In a wireless communication, base station is connected to central hub called _____
a) PSTN
b) MSC
c) CO
d) PBX
View Answer
Answer: b

62. PSTN stands for _____
a) Public switched telephone network
b) Personal switched telephone network
c) Personal switched telephone node
d) Public switched telephone node
View Answer
Answer: a

63. MSCs provide connectivity between PSTN and the base stations.
a) True
b) False
View Answer
Answer: a

64. Communication protocol, CAI stands for _____
a) Common air interchange
b) Control air interchange
c) Common air interface
d) Control air interchange
View Answer
Answer: a

65. At the base station, the air interface portion of mobile transmission is passed to MSC.
a) True
b) False
View Answer
Answer: b

66. PSTN is _____ and wireless networks are _____
a) Highly dynamic, virtually static
b) Static, virtually static
c) Highly dynamic, virtually dynamic
d) Virtually static, highly dynamic
View Answer
Answer: d

67. In public switched telephone network, LATA stands for _____
a) Local access and transport area
b) Land area and transport area
c) Local access and telephone access
d) Local area and telephone access
View Answer
Answer: a

68. LATAs are connected by a company called _____
a) Land exchange carrier
b) Local exchange carrier
c) Local control exchange
d) Land area exchange
View Answer
Answer: b

69. A long distance telephone company that collects toll is called _____
a) LATA
b) LEC
c) PSTN
d) IXC
View Answer
Answer: d

70. Wireless networks are extremely hostile and random nature of radio channel.
a) True
b) False
View Answer
Answer: a

71. The technique for separate but parallel signalling channel is called _____
a) Common channel signalling

b) Forward channel signalling
c) Reverse channel signalling
d) Separate channel signalling
View Answer
Answer: a

72. In North America, the cellular telephone signalling network uses _____
a) SS7
b) IXC
c) IS-41
d) PSTN
View Answer
Answer: a

73. What is the concept for accommodating a large number of users in a limited radio spectrum?
a) Grade of service
b) Trunking
c) Multiplexing
d) Multitasking
View Answer
Answer: b

74. On termination of call, the occupied channel is not returned to the pool of available channels in trunking.
a) True
b) False
View Answer
Answer: b
Explanation: In a trunked radio system, each user is allocated a channel on a per call basis. Upon termination of the call, the previously occupied channel is immediately returned to the pool of available channels. It is a method for a system to provide network access to many clients by sharing a set of lines or frequencies instead of providing them individually.

75. In trunking system, when the channel is already in use, the call is blocked or queued.
a) True
b) False
View Answer
Answer: a

76. Who developed the fundamental of trunking theory?
a) Newton
b) Ohm
c) Erlang
d) Einstein
View Answer
Answer: c

77. What is the unit for the measure of traffic intensity?
a) Meters
b) Henry
c) Ohm
d) Erlang
View Answer
Answer: d

78. One Erlang represents _____
a) One call- hour per hour
b) One call-minute per hour
c) One call- hour per minute
d) Many calls- hour per hour
View Answer
Answer: a

79. What is the measure of the ability of user to access a trunked system during the busiest hour?
a) Trunking
b) Grade of Service (GOS)
c) Multiplexing
d) Sectoring
View Answer
Answer: a

80. GOS is typically given as a likelihood that a _____
a) Call is in progress
b) Channels are busy
c) Call is blocked
d) Channel are free
View Answer
Answer: c

81. The time requires to allocate a trunked radio channel to a requesting user is called _____
a) Dwell time
b) Holding time
c) Run time
d) Set up Time
View Answer
Answer: d

82. Average duration of a typical call is called _____
a) Holding time
b) Dwell time
c) Set up time
d) Run time

View Answer
Answer: a

83. The average number of call requests per unit time is also known as _____
a) Request rate
b) Load
c) Grade o Service
d) Traffic intensity
View Answer
Answer: a

84. Traffic intensity offered by each user is the product of _____
a) Set up time and holding time
b) Call request rate and holding time
c) Load and holding time
d) Call request rate and set up time
View Answer
Answer: b

85. AMPS cellular system is designed for a GOS of _____ blocking.
a) 10%
b) 50 %
c) 2%
d) 1%
View Answer
Answer: c

86. Blocked calls cleared formula is also known as _____ formula.
a) Erlang C
b) Erlang A
c) Erlang D
d) Erlang B
View Answer
Answer: d

87. Blocked calls delayed formula is also known as _____
a) Erlang A
b) Erlang B
c) Erlang C
d) Erlang D
View Answer
Answer: c

BE (E&TC) – Mobile Communication

Multiple Choice Questions (MCQ)

Unit III - Cellular Concept

1) The modulation technique used for mobile communication systems during world war II was
a. Amplitude modulation
b. Frequency modulation
c. ASK
d. FSK
ANSWER: Frequency modulation

2) ——— introduced Frequency Modulation for mobile communication systems in 1935.
a. Edwin Armstrong
b. Albert Einstein
c. Galileo Galilei
d. David Bohm
ANSWER: Edwin Armstrong

3) The early FM push-to-talk telephone systems were used in
a. Simplex mode
b. Half duplex mode
c. Full duplex mode
d. None of the above
ANSWER: Half duplex mode

4) DECT stands for
a. Digital European Cellular Telex
b. Digitized Emergency Cellular Telephone
c. Digital European Cordless Telephone
d. Digital European Cellular Telephone
ANSWER: Digital European Cordless Telephone

5) World's first cellular system was developed by
a. Nippon Telephone and Telegraph (NTT)
b. Bellcore and Motorola
c. AT&T Bell Laboratories
d. Qualcomm
ANSWER: Nippon Telephone and Telegraph (NTT)

6) Paging systems were based on
a. Simplex systems
b. Half duplex systems
c. Full duplex systems

d. None of the above
ANSWER: Simplex systems

7) Paging systems could be used to
a. Send numeric messages
b. Send alphanumeric messages
c. Voice message
d. All of the above
ANSWER: All of the above

8) Garage door opener is a
a. Transmitter
b. Receiver
c. Transceiver
d. None of the above
ANSWER: Transmitter

9) Carrier frequency of a TV remote control is in the range
a. of Infra red
b. < 100 MHz
c. < 1 GHz
d. < 2 GHz
ANSWER: of Infra red

10) Half duplex system for communication has
a. Communication in single direction
b. Communication in single direction at a time
c. Communication in both directions at the same time
d. None of the above
ANSWER: Communication in single direction at a time

11) MIN stands for
a. Mobile Identification Number
b. Mobile Internet
c. Mobility In Network
d. None of the above
ANSWER: Mobile Identification Number

12) The process of transferring a mobile station from one base station to another is
a. MSC
b. Roamer
c. Hand off
d. Forward channel
ANSWER: Hand off

13) PCN is

a. Wireless concept of making calls
b. For receiving calls
c. Irrespective of the location of the user
d. All of the above
ANSWER: All of the above

14) IMT-2000 is a digital mobile system that functions as
a. Pager
b. Cordless
c. Low earth orbit satellites
d. All of the above
ANSWER: All of the above

15) The 2G cellular network uses
a. TDMA/FDD
b. CDMA/FDD
c. Digital modulation formats
d. All of the above
ANSWER: All of the above

16) NADC is a 2G standard for
a. TDMA
b. CDMA
c. Both a & b
d. None of the above
ANSWER: TDMA

17) 2G CDMA standard – cdma one supports up to
a. 8 users
b. 64 users
c. 32 users
d. 116 users
ANSWER: 64 users

18) 2G standards support
a. Limited internet browsing
b. Short Messaging Service
c. Both a & b
d. None of the above
ANSWER: Both a & b

19) The 2G GSM technology uses a carrier separation of
a. 1.25 MHz
b. 200 KHz
c. 30 KHz
d. 300 KHz

ANSWER: 200 KHz

20) 3G W-CDMA is also known as
a. UMTS
b. DECT
c. DCS-1800
d. ETACS
ANSWER: UMTS

21) Commonly used mode for 3G networks is
a. TDMA
b. FDMA
c. TDD
d. FDD
ANSWER: FDD

22) The minimum spectrum allocation required for W-CDMA is
a. 5MHz
b. 2MHz
c. 500KHz
d. 100KHz
ANSWER: 5MHz

23) CDMA2000 1xEV provides high speed data access with channel allocation of
a. 5 MHz
b. 50 MHz
c. 1.25 MHz
d. 4 MHz
ANSWER: 1.25 MHz

24) In TD-SDMA, there is a frame of _____milliseconds and the frame is divided into _____ time slots.
a. 5, 7
b. 7, 5
c. 2, 5
d. 5, 2
ANSWER: 5, 7

25) The interference between the neighboring base stations is avoided by
a. Assigning different group of channels
b. Using transmitters with different power level
c. Using different antennas
d. All of the above
ANSWER: Assigning different group of channels

26) Radio capacity may be increased in cellular concept by

a. Increase in radio spectrum
b. Increasing the number of base stations & reusing the channels
c. Both a & b
d. None of the above

ANSWER: Increasing the number of base stations & reusing the channels

27) The shape of the cellular region for maximum radio coverage is
a. Circular
b. Square
c. Oval
d. Hexagon
ANSWER: Hexagon

28) Hexagon shape is used for radio coverage for a cell because
a. It uses the maximum area for coverage
b. Fewer number of cells are required
c. It approximates circular radiation pattern
d. All of the above
ANSWER: All of the above

29) Centre excited hexagonal cells use
a. Sectored directional antennas
b. Omni directional antennas
c. Yagi uda antennas
d. None of the above
ANSWER: Omni directional antennas

30) Spectrum Efficiency of a cellular network is
a. The traffic carried by whole network
b. The traffic carried per cell divided by the bandwidth of the system and the area of a cell
c. Expressed in Erlang /MHz /km2
d. Both b and c
e. Both a and c
ANSWER: Both b and c

31) The advantage of using frequency reuse is
a. Increased capacity
b. Limited spectrum is required
c. Same spectrum may be allocated to other network
d. All of the above
ANSWER: All of the above

32) The strategies acquired for channel assignment are
a. Fixed
b. Dynamic

c. Regular
d. Both a and b
e. Both b and c
ANSWER: Both a and b

33) In a fixed channel assignment strategy, if all the assigned channels are occupied, the call
a. Gets transferred to another cell
b. Gets blocked
c. Is kept on waiting
d. All of the above
ANSWER: Gets blocked

34) In a fixed channel assignment strategy
a. Each cell is assigned a predetermined set of frequencies
b. The call is served by unused channels of the cell
c. The call gets blocked if all the channels of the cell are occupied
d. All of the above
ANSWER: All of the above

35) In a dynamic channel assignment strategy,
a. Voice channels are not permanently assigned
b. The serving base station requests for a channel from MSC
c. MSC allocates the channel according to the predetermined algorithm
d. All of the above
ANSWER: All of the above

36) Advantage of using Dynamic channel assignment is
a. Blocking is reduced
b. Capacity of the system is increased
c. Both a & b
d. None of the above
ANSWER: Both a & b

37) Disadvantage of using Dynamic channel assignment is
a. More storage required
b. Calculations and analysis is increased
c. Both a & b
d. None of the above
ANSWER: Both a & b

38) In Dynamic channel assignment, any channel which is being used in one cell can be reassigned simultaneously to another cell in the system at a reasonable distance.
a. True
b. False
ANSWER: True

39) In Handoff
a. Process of transferring the call to the new base station
b. Transfers the call
c. New channel allocation is done
d. All of the above
ANSWER: All of the above

40) Delay in handoffs is caused due to
a. Week signal conditions
b. High traffic conditions
c. Un availability of the channel
d. All of the above
ANSWER: All of the above

41) Inter system Handoffs are done
a. When mobile station moves in two cellular systems with different MSC
b. When mobile station moves between two cellular systems
c. When mobile station receives more power from other base station than the serving base station
d. All of the above
ANSWER: All of the above

42) When a fraction of assigned channel is reserved for handoffs, it is
a. Guard channel concept
b. Fixed channel assignment
c. Dynamic channel assignment
d. None of the above
ANSWER: Guard channel concept

43) While handoffs, the termination of call may be avoided by
a. Providing Guard channel
b. Queuing of handoffs
c. Both a & b
d. None of the above
ANSWER: Both a & b

44) Dwell time is the time for
a. A call within the cell
b. Hand off
c. Waiting for channel allocation
d. None of the above
ANSWER: A call within the cell

45) Dwell time depends upon
a. Interference
b. Distance between the subscriber and the base station
c. Propagation of call

d. All of the above
ANSWER: All of the above

46) In Mobile Assisted Handoff (MAHO), the handoff takes place when
a. The power received by the mobile station from other base station is more than the serving base station
b. The channel allocated is not available
c. The mobile station has no signal
d. All of the above
ANSWER: The power received by the mobile station from other base station is more than the serving base station

47) Mobile Assisted Handoff (MAHO) provides
a. Faster handoffs
b. Suitability for frequent handoffs
c. MSC need not monitor the signal strength
d. All of the above
ANSWER: All of the above

48) Trunking in a cellular network refers to
a. Termination of a call
b. Spectrum unavailability
c. Accommodating large number of users in limited spectrum
d. All of the above
ANSWER: Accommodating large number of users in limited spectrum

49) When all of the radio channels are in use in a trunking system
a. The user is blocked
b. The access to the system is denied
c. The queue may be provided
d. All of the above
ANSWER: All of the above

50) Umbrella cell approach
a. Uses large and small cells
b. Uses different antenna heights
c. Is used for high speed users with large coverage area and low speed users with small coverage area
d. All of the above
ANSWER: All of the above

51) Interference in cellular systems is caused by
a. Two base stations operating in same frequency band
b. Two calls in progress in nearby mobile stations
c. Leakage of energy signals by non cellular systems into cellular frequency band
d. All of the above

ANSWER: All of the above

52) Interference in frequency bands may lead to
a. Cross talk
b. Missed calls
c. Blocked calls
d. All of the above
ANSWER: All of the above

53) Co-channel reuse ratio depends upon
a. Radius of the cell
b. Distance between the centers of the co channel cells
c. Frequency allocation of nearest cells
d. Both a and b
e. Both b and c
ANSWER: Both a and b

54) Increase in Co- channel reuse ratio indicates
a. Better transmission quality
b. Larger capacity
c. Low co-channel interference
d. Both a and c
e. Both a and b
ANSWER: Both a and c

55) Grade of service refers to
a. Accommodating large number of users in limited spectrum
b. Ability of a user to access trunked system during busy hour
c. Two calls in progress in nearby mobile stations
d. High speed users with large coverage area
ANSWER: Ability of a user to access trunked system during busy hour

56) Traffic intensity is expressed in
a. Erlangs /MHz /km2
b. Erlangs
c. λ/ sec
d. dB/sec
ANSWER: Erlangs

57) The techniques used to improve the capacity of cellular systems are
a. Splitting
b. Sectoring
c. Coverage zone approach
d. All of the above
ANSWER: All of the above

58) Distributed antenna systems are used at
a. Transmitters of mobile systems
b. Transmitters of base stations
c. Inputs and outputs of repeaters
d. Receivers of mobile stations
ANSWER: Inputs and outputs of repeaters

59) Antenna down tilting refers to
a. Focusing radio energy towards ground
b. Decreasing the strength of antenna
c. Decreasing the S/N ratio at the antenna input
d. All of the above
ANSWER: Focusing radio energy towards ground

60) Diffraction, at high frequencies, depends upon
1. Geometry of the object
2. Polarization of the incident wave
3. Amplitude of the incident wave
4. Frequency of the incident wave

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 1, 2 and 3 are correct

61) The rainbow pattern seen on a CD is an example of
a. Reflection
b. Refraction
c. Diffraction
d. None of the above
ANSWER: Diffraction

62) Fresnel Reflection Coefficient is a factor of
1. Polarization of the wave
2. Properties of the material at which reflection occurs
3. Angle of incidence of wave

a. 1 and 2 are correct
b. 1 and 3 are correct
c. All the three are correct
d. 2 and 3 are correct
ANSWER: All the three are correct

63) When a wave falls on a perfect conductor
a. Wave is partially reflected and partially transmitted

b. All incident energy is reflected back without loss of energy
c. Part of energy gets absorbed
d. Both a and c

ANSWER: All incident energy is reflected back without loss of energy

64) Brewster angle is the angle at which
a. No reflection occurs at the first medium
b. Reflection coefficient is zero
c. The wave gets refracted in the direction of source
d. Both a and b
e. Both a and c
ANSWER: Both a and b

65) Fading is caused due to
1. Multi path propagation
2. Obstacles
3. Frequency variations at the source
4. Variation in amplitude and phase at receiver

a. 1 and 2 are correct
b. 1, 2 and 4 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 1, 2 and 4 are correct

66) Coherence time refers to
a. Time required to attain a call with the busy base station
b. Time required for synchronization between the transmitter and the receiver
c. Minimum time for change in magnitude and phase of the channel
d. None of the above
ANSWER: Minimum time for change in magnitude and phase of the channel

67) Fading due to shadowing is
a. Fading due to large obstructions
b. Large coherence time of the channel as compared to the delay constraints
c. Small coherence time of the channel as compared to the delay constraints
d. Both a and b
e. Both a and c
ANSWER: Both a and b

68) Deep fade is
1. Strong destructive interference
2. Drop in signal to noise ratio
3. Temporary failure of message transfer

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: All are correct

69) Doppler spread refers to
a. Signal fading due to Doppler shift in the channel
b. Temporary failure of message transfer
c. Large coherence time of the channel as compared to the delay constraints
d. All of the above
ANSWER: Signal fading due to Doppler shift in the channel

70) Friis free space equation
1. Is an expression for noise power
2. Is a function of transmitting and receiving antenna gain
3. Depends upon the distance between transmitting and receiving antenna

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 2 and 3 are correct

71) The free space model of propagation refers to
1. Unobstructed line of sight between the transmitter and receiver
2. Satellite communication systems and Microwave line of sight radio links
3. Propagation along the ground surface

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: 1 and 2 are correct

72) According to Friis free space equation
1. Received power falls with square of the distance between the transmitter and receiver
2. Increases with square of the distance between the transmitter and receiver
3. Received power increases with gains of transmitting and receiving antennas

a. 1 and 2 are correct
b. 1 and 3 are correct
c. All the three are correct
d. 2 and 3 are correct
ANSWER: All the three are correct

73) EIRP is
1. Effective Isotropic Radiated Power
2. Maximum radiated power available by the transmitter
3. A factor of power and gain of transmitter

a. 1 and 2 are correct
b. 1 and 3 are correct
c. All the three are correct
d. 2 and 3 are correct
ANSWER: All the three are correct

74) Spread spectrum modulation involves
1. PN sequence for modulation
2. Large bandwidth
3. Multiple users

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct

75) PN sequence at the decoder acts as a locally generated carrier at the receiver and decodes the signal using
a. Correlator
b. Adder
c. Frequency divider
d. PLL
ANSWER: Correlator

76) In spread spectrum technique, the multiple users are assigned with
a. Same spectrum and same PN code
b. Same spectrum and different PN code
c. Different spectrum and different PN code
d. Different spectrum and same PN code
ANSWER: Same spectrum and different PN code

77) Advantage of using Spread Spectrum modulation is/are
1. Interference rejection capability
2. Frequency planning is not required
3. Resistance to multipath fading
4. ISI is lesser

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct

d. All the four are correct
ANSWER: All the four are correct

78) Direct sequence spread spectrum demodulation uses
a. DPSK
b. FSK
c. ASK
d. QPSK
ANSWER: DPSK

79) Fast hopping is
a. More than one frequency hop during each symbol
b. Hopping rate greater than or equal to information symbol rate
c. One or more symbols transmitted between frequency hops
d. Both a and b
e. Both b and c
ANSWER: Both a and b

80) Slow frequency hopping refers to
a. One or more symbols transmitted in time interval between frequency hops
b. More than one frequency hop during each symbol
c. Hopping rate greater than or equal to information symbol rate
d. Both a and c are correct
ANSWER: One or more symbols transmitted in time interval between frequency hops

81) Probability of outage refers to
a. Noise developed at the receiver
b. Number of bit errors during transmission
c. Signal to noise ratio
d. All of the above
ANSWER: Number of bit errors during transmission

82) The digital modulation technique used in frequency selective channels is
a. FSK
b. ASK
c. BPSK
d. QPSK
ANSWER: BPSK

83) Working of Adaptive Equalizers include
a. Training
b. Tracking
c. Modulation
d. Both a and b
e. All a, b and c are correct
ANSWER: Both a and b

84) The time span for which the equalizer converges depends upon

1. Equalizer algorithm
2. Equalizer structure
3. Rate of change of multipath radio channel
4. Amplitude of signal

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All the four are correct
ANSWER: 1, 2 and 3 are correct

85) The Linear Equalizer may be implemented as

a. FIR filter
b. Lattice filter
c. Low pass filter
d. Both a and b
e. Both a and c
ANSWER: Both a and b

86) Linear equalizer is also known as

a. Transversal filter
b. Lattice filter
c. Low pass filter
d. None of the above
ANSWER: Transversal filter

87) The methods used for non linear equalization are

a. Decision Feedback Equalization
b. Maximum Likelihood Symbol Detection
c. Maximum Likelihood Sequence Estimation

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. None of the above
ANSWER: 1, 2 and 3 are correct

88) The performance of algorithms for Adaptive Equalization are given by

1. Rate of convergence

2. Computational complexity
3. Numerical properties
4. Frequency change

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 1, 2 and 3 are correct

89) Computational complexity of an algorithm refers to the
a. Number of operations for one iteration of algorithm
b. Inaccuracies in the mathematical analysis
c. Noise produced during one complete iteration of algorithm
d. All of the above
ANSWER: Number of operations for one iteration of algorithm

90) The algorithms acquired for adaptive equalization are
1. Zero forcing algorithm
2. Least mean squares algorithm
3. Recursive least squares algorithm

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. None of the above
ANSWER: 1, 2 and 3 are correct

91) Fractionally spaced equalizer acts as
a. Matched filter
b. Equalizer
c. Demodulator
d. Both a and b
e. All a, b and c are correct
ANSWER: Both a and b

92) Diversity employs the decision making at
a. Transmitter
b. Receiver
c. Transmitter and receiver
d. Communication channel
ANSWER: Receiver

93) The diversity schemes are based on
1. Time diversity
2. Frequency diversity

3. Space diversity
4. Polarization diversity

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All the four are correct
ANSWER: All the four are correct

94) In time diversity

a. Multiple versions of signals are transmitted at different time instants
b. The signal is transmitted using multiple channels
c. Signal is transmitted with different polarization
d. All of the above
ANSWER: Multiple versions of signals are transmitted at different time instants

95) RAKE receiver is
1. Several sub receivers
2. Several correlators
3. Fingers
4. Equalization based

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All the four are correct
ANSWER: 1, 2 and 3 are correct

96) The RAKE receiver involves the steps
a. Correlator, estimation of transmitted signal, demodulation, bit decision
b. Estimation of transmitted signal, correlator, demodulation, bit decision
c. Estimation of transmitted signal, demodulation, correlator, bit decision
d. Estimation of transmitted signal, demodulation, bit decision, correlator
ANSWER: Correlator, estimation of transmitted signal, demodulation, bit decision

97) Search window of a RAKE receiver is
a. Frequency band of the channel
b. Range of the time delays
c. Range of noise
d. All of the above
ANSWER: Range of the time delays

98) Speech Coders are categorized on the basis of
a. Signal compression techniques
b. Frequency of signal

c. Bandwidth of the signal
d. All of the above
ANSWER: Signal compression techniques

99) Waveform coders and Vocoders are the types of
a. Speech coders
b. Modulation technique
c. Frequency translation methods
d. Channel allocation for transmission
ANSWER: Speech coders

100) PCM, DPCM, DM, ADPCM are the types of
a. Vocoders
b. Waveform coders
c. Channel allocation for transmission
d. All of the above
ANSWER: Waveform coders

101) Speech coding technique that is independent of the source is
a. Vocoders
b. Waveform coders
c. Both a & b
d. None of the above
ANSWER: Waveform coders

102) Advantage of using waveform coders is
1. Independent of the signal source
2. Less complexity
3. Suitable for noisy environments

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct

103) The type of frequency domain coding that divides the speech signal into sub bands is
a. Waveform coding
b. Vocoders
c. Block transform coding
d. Sub-band coding
ANSWER: Sub-band coding

104) The speech coding technique that is dependent on the prior knowledge of the signal is
a. Waveform coders
b. Vocoders

c. Sub band coding
d. Block transform coding
ANSWER: Vocoders

105) The steps involved in Channel vocoders for speech transmission are
a. Envelope detection, sampling, encoding, multiplexing
b. Sampling, Envelope detection, encoding, multiplexing
c. Envelope detection, encoding, sampling, multiplexing
d. Sampling, Envelope detection, multiplexing, encoding
ANSWER: Envelope detection, sampling, encoding, multiplexing

106) Vocal tract cepstral coefficients and excitation coefficients are separated by
a. Samplers
b. Linear filters
c. Encoders
d. Multiplexers
ANSWER: Linear filters

107) In voice excited vocoders, PCM transmission helps in transmission of
a. High frequency bands of speech
b. Low frequency bands of speech
c. Multiplexed signals
d. Modulated signals
ANSWER: Low frequency bands of speech

108) Linear predictive coders are based on the principle that
1. Current signal sample is obtained from linear combination of past samples
2. Current signal sample is independent of past samples
3. These are time domain vocoders
4. They are among low bit rate vocoders

a. 1, 3 and 4 are correct
b. 2, 3 and 4 are correct
c. 1 and 4 are correct
d. All the four are correct
ANSWER: 1, 3 and 4 are correct

109) Multi pulse excited LPC includes
1. Multiple pulses per period
2. Minimization of weighted mean square error
3. Better speech quality
4. Pitch detection is not required

a. 1 and 4 are correct
b. 1 and 3 are correct
c. 2 and 4 are correct

d. All four are correct
ANSWER: All four are correct

110) In residual excited LPC,
a. The residue of subtraction of generated and original signal is quantized at the transmitter
b. Pitch detection is not required
c. Multiple pulses per period
d. Coder and decoders have predetermined set of codes
ANSWER: The residue of subtraction of generated and original signal is quantized at the transmitter

111) The speech sequence in GSM Codec consists of
a. Pre emphasis, segmentation, windowing, filtering
b. Windowing, Pre emphasis, segmentation, filtering
c. Pre emphasis, windowing, segmentation, filtering
d. Pre emphasis, segmentation, filtering, windowing
ANSWER: Pre emphasis, segmentation, windowing, filtering

112) The windowing technique used for speech coding in GSM Codec is
a. Blackman window
b. Welch window
c. Cosine window
d. Hamming window
ANSWER: Hamming window

113) The received signal at the GSM speech decoder is passed through
a. STP filter
b. LTP filter
c. Quantizer
d. PLL
ANSWER: LTP filter

114) In GSM Codec, the bits encoded for forward error correction are
a. Ia bits
b. Ib bits
c. II bits
d. Both a and b
e. Both a and c
ANSWER: Both a and b

115) The speech coders are selected on the basis of

1. Robustness to transmission errors
2. Cell size
3. Type of modulation technique used
4. Distance between the transmitter and receiver

a. 1 and 4 are correct
b. 1, 2 and 3 are correct
c. 2 and 4 are correct
d. All four are correct
ANSWER: 1, 2 and 3 are correct

116) FDMA is the division of
a. Time
b. Phase
c. Spectrum
d. Amplitude
ANSWER: Spectrum

117) Guard band is
a. The small unused bandwidth between the frequency channels to avoid interference
b. The bandwidth allotted to the signal
c. The channel spectrum
d. The spectrum acquired by the noise between the signal
ANSWER: The small unused bandwidth between the frequency channels to avoid interference

118) Cable television is an example of
a. TDMA
b. FDMA
c. CDMA
d. SDMA
ANSWER: FDMA

119) In FDMA,

1. Each user is assigned unique frequency slots
2. Demand assignment is possible
3. Fixed assignment is possible
4. It is vulnerable to timing problems
a. 1 and 2 are correct
b. 2 and 4 are correct
c. 1, 2 and 3 are correct
d. All four are correct
ANSWER: 1, 2 and 3 are correct

120) FDMA demand assignment uses
1. Single channel per carrier
2. Multi channel per carrier
3. Single transmission in one time slot
4. Multi transmission in one time slot

a. 1 and 2 are correct
b. 2, 3 and 4 are correct
c. 1, 2 and 3 are correct
d. All four are correct
ANSWER: 1 and 2 are correct

121) The advantages of FDMA over TDMA includes
1. Division is simpler
2. Propagation delays are eliminated
3. Cheaper filters with less complicated logic functions
4. Linearity

a. 1, 2 and 3 are correct
b. 1 and 2 are correct
c. 1 and 4 are correct
d. All four are correct
ANSWER: 1 and 2 are correct

122) TDMA is a multiple access technique that has
a. Different users in different time slots
b. Each user is assigned unique frequency slots
c. Each user is assigned a unique code sequence
d. Each signal is modulated with frequency modulation technique
ANSWER: Different users in different time slots

123) In TDMA, the user occupies the whole bandwidth during transmission
a. True
b. False
ANSWER: True

124) TDMA allows the user to have
a. Use of same frequency channel for same time slot
b. Use of same frequency channel for different time slot
c. Use of same time slot for different frequency channel
d. Use of different time slot for different frequency channels
ANSWER: Use of same frequency channel for different time slot

125) GSM is an example of
a. TDMA cellular systems
b. FDMA cellular systems
c. CDMA cellular systems
d. SDMA cellular systems
ANSWER: TDMA cellular systems

126) TDMA is employed with a TDMA frame that has preamble. The preamble contains
Address of base station and subscribers

1. Synchronization information
2. Frequency allotted
3. Coded sequence

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 4 are correct
d. All four are correct
ANSWER: 1 and 2 are correct

127) CDMA is
1. Spread spectrum technology
2. Using same communication medium
3. Every user stays at a certain narrowband channel at a specific time period
4. Each user has unique PN code

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All four are correct
ANSWER: 1, 2 and 4 are correct

128) Global Positioning System uses

a. CDMA
b. TDMA
c. SDMA
d. FDMA
ANSWER: CDMA

129) CDMA is advantageous over other Spread Spectrum techniques for
1. The privacy due to unique codes
2. It rejects narrow band interference
3. Resistance to multi path fading
4. Its ability to frequency reuse

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct

130) The wide band usage in CDMA helps in
1. Increased immunity to interference
2. Increased immunity to jamming
3. Multiple user access

4. Different spectrum allocation in different time slots

a. 1, 2 and 3 are correct
b. 2, 3 and 4 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: 1, 2 and 3 are correct

131) The advantages of using a CDMA technique over other spread spectrum techniques are
1. Increased capacity
2. Easier handoff
3. Better measure of security
4. Multiple users occupy different spectrum at a time

a. 1, 2 and 3 are correct
b. 2, 3 and 4 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: 1, 2 and 3 are correct

132) FHMA is
1. Spread spectrum technology
2. Using same communication medium
3. Every user has assigned unique frequency slot
4. Each user has unique PN code

a. 1 and 2 are correct
b. 1, 2 and 4 are correct
c. 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct

133) OFDM is a technique of

1. Encoding digital data
2. Multiple carrier frequencies
3. Wide band digital communication
4. 4G mobile communication

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct

134) Advantages of using OFDM include

1. Avoids complex equalizers
2. Low symbol rate and guard interval
3. Avoids ISI
4. Multiple users at same frequency

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct

135) The troubles that OFDM faces over other spread spectrum techniques are
1. Sensitivity to Doppler shift
2. Frequency synchronization problems
3. Time synchronization problems
4. Low efficiency due to guard intervals

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: 1, 2 and 4 are correct

136) The guard interval is provided in OFDM
a. To eliminate the need of pulse shaping filter
b. To eliminate ISI
c. High symbol rate
d. Both a and b
e. Both b and c
ANSWER: Both a and b

137) Packet radio refers to
a. Multiple users on single channel
b. Single user on multiple channels as per demand
c. Multiple users on multiple channels at different time slots
d. Multiple users with coding techniques
ANSWER: Multiple users on single channel

138) Disadvantages of packet radio are
a. Induced delays
b. Low spectral efficiency
c. Large spectrum required
d. Both a and b
e. Both b and c
ANSWER: Both a and b

139) Pure ALOHA is a
a. Random access protocol
b. Scheduled access protocol
c. Hybrid access protocol
d. Demand access protocol
ANSWER: Random access protocol

140) The increase in number of users in PURE ALOHA causes
a. Increase in delay
b. Increase in probability of collision
c. Increase in spectrum
d. Both a and b
e. Both a and c
ANSWER: Both a and b

141) SDMA technique employs
a. Smart antenna technology
b. Use of spatial locations of mobile units within the cell
c. More battery consumption
d. Both a and b are correct
e. Both b and c are correct
ANSWER: Both a and b are correct

142) The advantage of using SDMA over other spread spectrum technique is
a. Mobile station battery consumption is low
b. Reduced spectral efficiency
c. Increased spectral efficiency
d. Both a and b are correct
e. Both a and c are correct
ANSWER: Both a and c are correct

143) The increased capacity of SDMA is due to
a. Focused signal transmitted into narrow transmission beams
b. Smart antennas pointing towards mobile stations
c. Use of different frequencies at same time slot
d. Both a and b are correct
e. Both a and c are correct
ANSWER: Both a and b are correct

144) Coherence time is
a. Directly proportional to Doppler spread
b. Indirectly proportional to Doppler spread
c. Directly proportional to square of Doppler spread
d. Directly proportional to twice of Doppler spread
ANSWER: Directly proportional to Doppler spread

145) Types of small scale fading, based on Doppler spread are
a. Fast fading
b. Frequency non selective fading
c. Flat fading
d. Frequency selective fading
ANSWER: Fast fading

146) Flat fading or frequency nonselective fading is a type of

a. Multipath delay spread small scale fading
b. Doppler spread small scale fading
c. Both a & b
d. None of the above
ANSWER: Multipath delay spread small scale fading

147) In Frequency Selective Fading, the
a. Coherence Bandwidth of the channel is less than bandwidth of transmitted channel
b. Coherence Bandwidth of the channel is more than bandwidth of transmitted channel
c. Coherence Bandwidth of the channel is equal to bandwidth of transmitted channel
d. None of the above
ANSWER: Coherence Bandwidth of the channel is less than bandwidth of transmitted channel

148) If coherence time of the channel is smaller than the symbol period of the transmitted signal, it is
a. Fast fading
b. Slow fading
c. Frequency selective fading
d. Frequency non selective fading
ANSWER: Fast fading

149) The power delay profile helps in determining
a. Excess delay
b. rms delay spread
c. Excess delay spread
d. All of the above
ANSWER: All of the above

150) Coherence bandwidth is
a. Channel that passes all spectral components with equal gain
b. The bandwidth of modulated signal
c. Channel that passes all spectral components with linear phase
d. Both a and c
e. Both a and b
ANSWER: Both a and c

151) Small scale multipath propagation is caused due to waves with

1. Different propagation delays
2. Different amplitudes
3. Different phase

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct

152) The effects of small scale multipath propagation are
1. Changes in signal strength
2. Random frequency modulation
3. Time dispersion

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct

153) Impulse response of a multipath channel is determined by the fact that

a. Mobile radio channel may be modeled as linear filter
b. Impulse response is time varying
c. Both a & b
d. None of the above
ANSWER: Both a & b

154) The received signal from a multipath channel is expressed as
a. Convolution of transmitted signal and impulse response
b. Addition of transmitted signal and impulse response
c. Subtraction of transmitted signal and impulse response
d. All of the above
e. None of the above
ANSWER: Convolution of transmitted signal and impulse response

155) Direct RF pulse system helps in calculating
a. Impulse response in frequency domain
b. Impulse response in phase domain
c. Power delay of the channel
d. All of the above
ANSWER: Power delay of the channel

156) The techniques used for small scale multipath measurements are
1. Direct RF pulse system

2. Spread spectrum sliding correlator channel sounding
3. Frequency domain channel sounding

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct

BE (E&TC) – Mobile Communication

Multiple Choice Questions (MCQ)

Unit No. 4 : GSM Fundamentals

1. What are the three main parts of a GSM Architecture or Structure?
A) Mobile Station
B) BSS - Base Station Subsystem
C) NSS - Network and Switching Subsystem
D) All the above
Answer: D

2. What are the main parts of a Mobile Station in a GSM Network?
A) MT - Mobile Terminal
B) SIM - Subscriber Identity Module
C) Both A and B
D) None
Answer: C

3. What are the main parts of a BSS (Base Station Subsystem) in a GSM network?
A) BTS - Base Transceiver Station
B) BSC - Base Station Controller
C) A and B
D) None
Answer: C

4. What are the main parts of a NSS (Network and Switching Subsystem) of a GSM Architecture?
A) MSC - Mobile Switching Center
B) HLR & AuC
C) VLR, EIR
D) All the above
Answer: D

5. What are the main parts of an MSC (Mobile Switching Center) system in a GSM structure?
A) MGW - Media Gateway
B) MSC Server
C) Both A and B
D) None
Answer: C

6. A GPRS Core network is part of System in a GSM Network Structure?
A) Mobile Station
B) BSS

C) MSS
D) NSS
Answer: D

7. A BTS is also called _____ by general public?
A) Mobile tower
B) Exchange
C) Charging Point
D) None
Answer: A

8. Each Mobile Terminal is identified by a unique _____ number?
A) IMEI
B) SIM
C) IMSI
D) None
Answer: A

9. IMEI stands for?
A) Internal Mobile Equipment Identity
B) International Mobile Equipment Identity
C) Intra Mobile Enable Identity
D) None
Answer: B

10. Each SIM is identified by a unique _____ number?
A) IMSI
B) IMEI
C) MSDN
D) None
Answer: A

11. IMSI stands for?
A) Internal Mobile Subscriber Identity
B) International Mobile Subscriber Identity
C) Investigating Mobile Subscriber Identity
D) None
Answer: B

12. Your mobile number is actually called _____ number.
A) IMSI
B) SIM
C) MSISDN
D) None
Answer: C

13. IMSI number of a SIM is also called?
A) MSISDN
B) IMEI
C) ICCID
D) None
Answer: C

14 What controller a group of BTS or Cell Towers?
A) BSC
B) MSC
C) HLR
D) VLR
Answer: A

15. How many digits of PIN (Personal Identification Number) is allowed to protect a SIM card?
A) 4
B) 8
C) 10
D) None
Answer: A

16. What is PUK code of a SIM?
A) PIN Unlock Key
B) 4 digit code
C) It is like a password to enter after inserting SIM in a mobile for the first time. It prevents misuse.
D) All
Answer: D

17. The only element that personalises a Mobile Station is _____?
A) Back cover
B) SIM
C) Screen guard
D) None
Answer: B

18. What is the maximum number of Transceivers a BTS can handle is ?
A) 8
B) 12
C) 16
D) 22
Answer: C

19. What are the functions of a BSC?
A) Handovers, exchange functions
B) Frequency hopping

C) Control of radio frequency power level of BTS
D) All
Answer: D

20. What is the main function of NSS?
A) Establishing communication between mobile and landline numbers.
B) Providing eligible services to the subscriber
C) Providing parameters for Authentication and Encryption
D) All
Answer: D

21. Which of the following is the world's first cellular system to specify digital modulation and network level architecture?
a) GSM
b) AMPS
c) CDMA
d) IS-54
View Answer
Answer: a

22. Previously in 1980s, GSM stands for _____
a) Global system for mobile
b) Groupe special mobile
c) Global special mobile
d) Groupe system mobile
View Answer
Answer: b

23. Who sets the standards of GSM?
a) ITU
b) AT & T
c) ETSI
d) USDC
View Answer
Answer: c

24. Which of the following does not come under the teleservices of GSM?
a) Standard mobile telephony
b) Mobile originated traffic
c) Base originated traffic
d) Packet switched traffic
View Answer
Answer: d

25. Which of the following comes under supplementary ISDN services?
a) Emergency calling

b) Packet switched protocols
c) Call diversion
d) Standard mobile telephony
View Answer
Answer: c

26. Which of the following memory device stores information such as subscriber's identification number in GSM?
a) Register
b) Flip flop
c) SIM
d) SMS
View Answer
Answer: c

27. Which of the following feature makes impossible to eavesdrop on GSM radio transmission?
a) SIM
b) On the air privacy
c) SMS
d) Packet switched traffic
View Answer
Answer: b
.

28. Which of the following does not come under subsystem of GSM architecture?
a) BSS
b) NSS
c) OSS
d) Channel
View Answer
Answer: d

29. Which of the following subsystem provides radio transmission between mobile station and MSC?
a) BSS
b) NSS
c) OSS
d) BSC
View Answer
Answer: a

30. _____ manages the switching function in GSM.
a) BSS
b) NSS
c) OSS

d) MSC
View Answer
Answer: b

31. Cellular concept replaces many low power transmitters to a single high power transmitter.
a) True
b) False
View Answer
Answer: b

32. Why neighbouring stations are assigned different group of channels in cellular system?
a) To minimize interference
b) To minimize area
c) To maximize throughput
d) To maximize capacity of each cell
View Answer
Answer: a

33. What is a cell in cellular system?
a) A group of cells
b) A group of subscribers
c) A small geographical area
d) A large group of mobile systems
View Answer
Answer: a

34. What is frequency reuse?
a) Process of selecting and allocating channels
b) Process of selection of mobile users
c) Process of selecting frequency of mobile equipment
d) Process of selection of number of cells
View Answer
Answer: a

35. Which of the following is a universally adopted shape of cell?
a) Square
b) Circle
c) Triangle
d) Hexagon
View Answer
Answer: d

36. Actual radio coverage of a cell is called _____
a) Fingerprint
b) Footprint
c) Imprint

d) Matrix
View Answer
Answer: b

37. Why the shape of cell is not circle?
a) Omni directionality
b) Small area
c) Overlapping regions or gaps are left
d) Complex design
View Answer
Answer: c

38. What is the main reason to adopt hexagon shape in comparison to square and triangle?
a) Largest area
b) Simple design
c) Small area
d) Single directional
View Answer
Answer: a

39. Which type of antenna is used for center excited cells?
a) Dipole antenna
b) Grid antenna
c) Sectored antenna
d) Omnidirectional antenna
View Answer
Answer: d

40. Which type of antenna is used for edge excited cells?
a) Omnidirectional antenna
b) Grid antenna
c) Sectored directional antenna
d) Dipole antenna
View Answer
Answer: c

41. For a cellular system, if there are N cells and each cell is allocated k channel. What is the total number of available radio channels, S?
a) S=k*N
b) S=k/N
c) S=N/k
d) S=kN
View Answer
Answer: a

42. What is a cluster in a cellular system?

a) Group of frequencies
b) Group of cells
c) Group of subscribers
d) Group of mobile systems
View Answer
Answer: b

43. What is a frequency reuse factor for N number of cells in a system?
a) N
b) N2
c) 2*N
d) 1/N
View Answer
Answer: d

44. Capacity of a cellular system is directly proportional to _____
a) Number of cells
b) Number of times a cluster is replicated
c) Number of Base stations
d) Number of users
View Answer
Answer: b

45. A spectrum of 30 MHz is allocated to a cellular system which uses two 25 KHz simplex channels to provide full duplex voice channels. What is the number of channels available per cell for 4 cell reuse factor?
a) 150 channels
b) 600 channels
c) 50 channels
d) 85 channels
View Answer
Answer: a

46. Which of the following is not an objective for channel assignment strategies?
a) Efficient utilization of spectrum
b) Increase of capacity
c) Minimize the interference
d) Maximize the interference
View Answer
Answer: d

47. The choice of channel assignment strategy does not impact the performance of the system.
a) True
b) False

View Answer
Answer: b

48. In fixed channel assignment strategy, each cell is allocated a predetermined set of _____
a) Voice channels
b) Control channels
c) Frequency
d) base stations
View Answer

Answer: a
Explanation: In a foxed channel strategy, each cell is allocated a predetermined set of voice channels. Any call attempt within the cell can only be served by the unused channels in that particular cell.

49. What happen to a call in fixed channel strategy, if all the channels in a cell are occupied?
a) Queued
b) Cross talk
c) Blocked
d) Delayed
View Answer

Answer: c
Explanation: As any call attempt within a cell can be served by unused channels in fixed channel strategy. If all the channels in that cell are occupied, the call is blocked and subscriber does not receive any service.

50. What is a borrowing strategy in fixed channel assignments?
a) Borrowing channels from neighbouring cell
b) Borrowing channels from neighbouring cluster
c) Borrowing channels from same cell
d) Borrowing channels from other base station in same cell
View Answer

Answer: a
Explanation: In borrowing strategy, a cell is allowed to borrow channels from a neighbouring cell if all of its own channels are already occupied. The MSC supervises such borrowing procedure and ensures that the borrowing of channel does not interfere with any call in progress.

51. In dynamic channel assignment strategy, voice channels are allocated to different cells permanently.
a) True
b) False
View Answer

Answer: b

Explanation: In a dynamic channel strategy, voice channels are not allocated to different cells permanently. Instead, serving base station requests a channel from MSC each time a cell request is made.

51. In dynamic channel assignment strategy, base station requests channel from _____
a) MSC
b) Neighbouring cell
c) Neighbouring cluster
d) Neighbouring base station
View Answer

Answer: a
Explanation: Each time a call request is made, the serving base station requests a channel from the MSC. The switch then allocates a channel to the requested cell following an algorithm that takes into account the likelihood of future blocking within the cell.

52. Dynamic channel assignment reduces the likelihood of blocking in comparison to fixed channel assignment.
a) True
b) False
View Answer

Answer: a
Explanation: Dynamic channel assignment reduces the likelihood of blocking. Accordingly, the MSC only allocates a given frequency if that frequency is not presently in use in the cell or any other cell which falls within the minimum restricted distance of frequency reuse.

53. RSSI stands for _____
a) Radio System Signal Indicator
b) Restricted Signal Strength Indicator
c) Radio Signal Strength Indication
d) Restricted System Software Indicator
View Answer

Answer: a
Explanation: Received signal strength indicator (RSSI) is a measurement of the power present in a received radio signal. RSSI is usually invisible to a user of a receiving device.

54. What is the drawback of dynamic channel assignment?
a) Decrease channel utilization
b) Increase probability of blocked call
c) Cross talk
d) Increase storage and computational load on system
View Answer

Answer: d

Explanation: Dynamic channel assignment requires the MSC to collect real time data on channel occupancy, traffic distribution and RSSI of all channels on continuous basis. This increases the storage and computational load on the system but provides the advantage of increased channel utilization and decreased probability of blocked call

55. What is the condition for handoff?
a) A mobile moves into a different cell while in conversation
b) A mobile remains in the same cell while in conversation
c) A mobile moves to different cell when idle
d) A mobile remains in the same cell and is idle
View Answer
Answer: a

56. Handoff does not require voice and control channel to be allocated to channels associated with the new base station.
a) True
b) False
View Answer
Answer: b

57. The time over which a call can be maintained within a cell without handoff is called _____
a) Run time
b) Peak time
c) Dwell time
d) Cell time
View Answer
Answer: c

58. Dwell time does not depend on which of the following factor?
a) Propagation
b) Interference
c) Distance between subscriber and base station
d) Mobile station
View Answer
Answer: d

59. Which of the following is associated with the handoff in first generation analog cellular systems?
a) Locator receiver
b) MAHO
c) Cell dragging
d) Breathing cell
View Answer
Answer: a

60. MAHO stands for _____
a) MSC assisted handoff
b) Mobile assisted handoff
c) Machine assisted handoff
d) Man assisted handoff
View Answer
Answer: b

61. A handoff is initiated when the power received from the base station of a neighbouring cell falls behind the power received from the current base station by certain level.
a) True
b) False
View Answer
Answer: b

62. What is the condition for intersystem interference?
a) Mobile moves from one cell to another cell
b) Mobile remains in the same cell
c) Mobile moves from one cellular system to another cellular system
d) Mobile remains in the same cluster
View Answer
Answer: c

63. What is the disadvantage of guard channel?
a) Efficient utilization of spectrum
b) Cross talk
c) Near far effect
d) Reduce total carried traffic
View Answer
Answer: d

64. Which of the following priority handoff method decrease the probability of forced termination of a call due to lack of available channels?
a) Queuing
b) Guard channel
c) Cell dragging
d) Near far effect
View Answer
Answer:

65. Umbrella cell approach is possible by using _____
a) Antenna of same heights
b) Antenna of different heights
c) Different voice channels
d) Different control channels
View Answer

Answer: b

66. Cell dragging is a problem occur due to _____
a) Pedestrian users
b) Stationary users
c) High speed mobile systems
d) Base stations having same frequency
View Answer
Answer: a

67. What was the typical handoff time in first generation analog cellular systems?
a) 1 second
b) 10 seconds
c) 1 minute
d) 10 milliseconds
View Answer
Answer: b

14. How much time it takes for handoff in digital cellular systems like GSM?
a) 1 second
b) 10 seconds
c) 1 minute
d) 10 milliseconds
View Answer
Answer: a

68. Soft handoff is also known as _____
a) MAHO
b) Hand over
c) Break before make
d) Make before break
View Answer
Answer: d

69. Which of the following is not a source of interference?
a) Base station in a different cluster
b) Another mobile in same cell
c) A call in progress in neighbouring cell
d) Any BS operating on same frequency
View Answer
Answer: a

70. Interference on voice channels causes _____
a) Blocked calls
b) Cross talk
c) Queuing

d) Missed calls
View Answer
Answer: b

71. Interference in control channel leads to _____
a) Cross talk
b) Queuing
c) Blocked calls
d) Voice traffic
View Answer
Answer: c

72. Interference is more severe in rural areas.
a) True
b) False
View Answer
Answer: b

73. What are co-channel cells?
a) Cells having different base stations
b) Cells using different frequency
c) Cells using adjacent frequency
d) Cells using same frequency
View Answer
Answer: d

74. Co-channel interference is a function of _____
a) Radius of cell
b) Transmitted power
c) Received power
d) Frequency of mobile user
View Answer
Answer: a

75. Co-channel reuse ratio is define by _____
a) Q=D*R
b) Q=D/R
c) Q=D^R
d) Q=1/R
View Answer
Answer: b

76. Co-channel ratio in terms of cluster size is defined as _____
a) (3N)−−−−√
b) N
c) 3N

d) √N
View Answer
Answer: a

77. What is the cluster size for CDMA?
a) N=10
b) N=100
c) N=1
d) N=50
View Answer
Answer: c

78. What is breathing cell effect?
a) Fixed coverage region
b) Dynamic and time varying coverage region
c) Large coverage region
d) Very small coverage region
View Answer
Answer: b

79. Adjacent channel interference occurs due to _____
a) Power transmitted by Base station
b) MSCs
c) Same frequency of mobile users
d) Imperfect receiver filters
View Answer
Answer: d

80. Which of the following problem occur due to adjacent channel interference?
a) Blocked calls
b) Cross talk
c) Near-far effect
d) Missed calls
View Answer
Answer: c

81. In near-far effect, a nearby transmitter captures the _____
a) Receiver of the subscriber
b) Transmitter of the subscriber
c) Nearby MSC
d) Neighbouring base station
View Answer
Answer: a

82. Adjacent channel interference can be minimized through _____

a) Changing frequency of base stations
b) Careful filtering and channel assignments
c) Increasing number of base stations
d) Increasing number of control channels
View Answer
Answer: b

83. In dynamic channel assignment, any channel which is being used in one cell can be reassigned simultaneously to another cell in the system at a reasonable distance.
a) True
b) False
View Answer
Answer: a

84. _____ is a first-generation cellular phone system.
A) AMPS
B) D-AMPS
C) GSM
D) none of the above
Ans: A

85. _____ is a second-generation cellular phone system.
A) AMPS
B) D-AMPS
C) GSM
D) none of the above
Ans: B

86. _____ is a digital version of AMPS.
A) GSM
B) D-AMPS
C) IS-95
D) none of the above
Ans: B

87. _____ is a second-generation cellular phone system used in Europe.
A) GSM
B) D-AMPS
C) IS-95
D) none of the above
Ans: A

88. _____ is a second-generation cellular phone system based on CDMA and DSSS.
A) GSM
B) D-AMPS
C) IS-95

D) none of the above
Ans: C

89. The _____ cellular phone system will provide universal personal communication.
A) first-generation
B) second-generation
C) third-generation
D) none of the above
Ans: C

90. In a _____ handoff, a mobile station only communicates with one base station.
A) hard
B) soft
C) medium
D) none of the above
Ans: A

91. In a _____ handoff, a mobile station can communicate with two base stations at the same time.
A) hard
B) soft
C) medium
D) none of the above
Ans: B

92. _____ is an analog cellular phone system using FDMA.
A) AMPS
B) D-AMPS
C) GSM
D) none of the above
Ans: A

93. AMPS operates in the ISM _____ band.
A) 800-MHz
B) 900-MHz
C) 1800-MHz
D) none of the above
Ans: A

94. In AMPS, each band is divided into _____ channels.
A) 800
B) 900
C) 1000
D) none of the above
Ans: D

95. AMPS has a frequency reuse factor of _____.
A) 1
B) 3
C) 5
D) 7
Ans: D

96. AMPS uses _____ to divide each 25-MHz band into channels.
A) FDMA
B) TDMA
C) CDMA
D) none of the above
Ans: A

97. D-AMPS uses _____ to divide each 25-MHz band into channels.
A) FDMA
B) TDMA
C) CDMA
D) both (a) and (b)
Ans: D

98. GSM allows a reuse factor of _____.
A) 1
B) 3
C) 5
D) 7
Ans: B

99. GSM is a digital cellular phone system using _____.
A) FDMA
B) TDMA
C) CDMA
D) both (a) and (b)
Ans: D

100. IS-95 is based on _____.
A) FDMA
B) CDMA
C) DSSS
D) all of the above
Ans: D

101. IS-95 uses the ISM _____band.
A) 800-MHz
B) 900-MHz

C) 1900-MHz
D) either (a) or (c)
Ans: D

102. IS-95 uses the _____ satellite system for synchronization.
A) GPS
B) Teledesic
C) Iridium
D) none of the above
Ans: A

103. In an IS-95 system, the frequency-reuse factor is normally _____.
A) 1
B) 3
C) 5
D) 7
Ans: A

104. In the third generation of cellular phones, _____ uses W-CDMA.
A) IMT-DS
B) IMT-MC
C) IMT-TC
D) IMT-SC
Ans: A

105. In the third generation of cellular phones, _____ uses CDMA2000.
A) IMT-DS
B) IMT-MC
C) IMT-TC
D) IMT-SC
Ans: B

106. In the third generation of cellular phones, _____ uses a combination of W-CDMA and TDMA.
A) IMT-DS
B) IMT-MC
C) IMT-TC
D) IMT-SC
Ans: C

107. In the third generation of cellular phones, _____ uses TDMA.
A) IMT-DS
B) IMT-MC
C) IMT-TC
D) IMT-SC

Ans: D

108. The period of a satellite, the time required for a satellite to make a complete trip around the Earth, is determined by _____ law.
A) Kepler's
B) Newton's
C) Ohm's
D) none of the above
Ans: A

109. The signal from a satellite is normally aimed at a specific area called the _____.
A) path
B) effect
C) footprint
D) none of the above
Ans: C

110. There is (are) _____ orbit(s) for a GEO satellite.
A) one
B) two
C) many
D) none of the above
Ans: A

111. MEO satellites are located at altitudes between km.
A) 3000 and 5000
B) 5000 and 10,000
C) 5000 and 15,000
D) none of the above
Ans: C

112. LEO satellites are normally below an altitude of _____ km.
A) 1000
B) 2000
C) 3000
D) none of the above
Ans: B

113. _____ is based on a principle called trilateration.
A) GPS
B) Teledesic
C) Iridium
D) none of the above
Ans: A

114. Low-Earth-orbit (LEO) satellites have _____ orbits.
A) equatorial
B) polar
C) inclined
D) none of the above
Ans: B

115. A GEO is at the _____ orbit and revolves in phase with Earth.
A) equatorial
B) polar
C) inclined
D) none of the above
Ans: A

116. GPS satellites are _____ satellites.
A) GEO
B) MEO
C) LEO
D) none of the above
Ans: B

117. _____ satellites provide time and location information for vehicles and ships.
A) GPS
B) Iridium
C) Teledesic
D) none of the above
Ans: A

118. Iridium satellites are _____satellites.
A) GEO
B) MEO
C) LEO
D) none of the above
Ans: C

119. _____ satellites can provide direct universal voice and data communications for handheld terminals.
A) GPS
B) Iridium
C) Teledesic
D) none of the above
Ans: B

120. Teledesic satellites are _____satellites.
A) GEO

B) MEO
C) LEO
D) none of the above
Ans: C

121. _____ satellites will provide universal broadband Internet access.
A) GPS
B) Iridium
C) Teledesic
D) none of the above
Ans:

122. Which channel is used to transmit random access signals?
A. BCCH
B. CCCH
C. SDCCH
D. TCH
Ans: B

123. Which one of the following is the combination of main BCCH?
A. TCH+SACCH
B. FCH+SCH+BCH+CCCH
C. SDCCH/8+SACCH/8
D. FCH+SCH+BCH+SDCCH+SACCH
Ans: B

124. The Value Range of Timing Advance (TA) in GSM is?
A. 0-31
B. 0-127
C. 0-63
D. 0-7
Ans: C

125. How many MS can be paged with 1 paging massage with IMSI?
A. 1
B. 2
C. 3
D. 4
Ans: B

126. Directed Retry handover means?
A. TCH to TCH
B. SDCCH to TCH
C. SDCCH to SDCCH
D. None of Above
Ans: B

127. How many neighbors are measured by MS at a time?
A. 5
B. 6
C. 7
D. 8
Ans: B

128. Time Duration of Super Frame?
A. 3 Hour 28 minutes 53 seconds 760 ms
B. 6.12 seconds
C. 235.65 ms
D. 120 ms
Ans: B

129. Maximum number of characters allowed in one SMS?
A. 160
B. 170
C. 180
D. 150
Ans: A

130. If you have 5 MHz frequency band what will be the maximum number of channels as per GSM system?
A. 25
B. 35
C. 20
D. 24
Ans: A

132. Which kind of Handovers more desired in the Network?
A. Rx Level
B. Power Budget
C. Rx Quality
D. Interference
Ans: B

133. SDCCH holding time for Normal location update is
A. 3.8ms
B. 3.5sec
C. 3.5ms
D. None of them
Ans: B

134. SDCCH holding time for call setup (MOC) is
A. 2.7sec

B. 3.5sec
C. 2.7ms
D. 3.5ms
Ans: A

135. _____ supports the operation and maintenance of GSM.
a) BSS
b) NSS
c) OSS
d) MSC
View Answer
Answer: c

MC Online Quiz1 on Unit No.1

* Required

1. Email address *

2. Class *

Mark only one oval.

- BE-A
- BE-B

3. Roll.No

4. Name of Student (Full Name)

5. 1.1G or First Generation Mobile Network is _____? * 1 point

Mark only one oval.

- Analog
- Digital
- Sequential
- Fuzzy

6. 2.In a 1G network, the type of communication between Tower ot BTS and Switching Center is _____? * 1 point

Mark only one oval.

- Analog
- Digital
- Discrete
- Diminished

7. 3.Who launched the first commercial 1G network in the world? * 1 point

Mark only one oval.

- NTT, Japan
- NMT, Netherlands
- TACS, UK
- AMPS, America

8. 4. What are main problems in 1G technology? * 1 point

Mark only one oval.

- Noise
- Security
- Poor Battery backup
- All the above

9. 5. What is the Cell Size or Coverage Area in 1G technology? * 1 point

Mark only one oval.

- 1-5Km
- 20-60Km
- 5-50Km
- 2-30Km

10. 6.GSM corresponds to which generation? * 1 point

Mark only one oval.

- 1G
- 1.5G
- 2G
- 3G

11. 7.GSM stands for? * 1 point

Mark only one oval.

- Global System for Mobile Communication
- Global Service for Mobile Communication
- Geo Synchronous Mobile Communication
- None of the above

12. 8.Data service started or offered by 2G GSM technology is? * 1 point

Mark only one oval.

- GPRS
- EDGE
- H
- A and B

13. 9.GPRS stands for ? * 1 point

Mark only one oval.

- General Packet Radio Service
- General Packet Radio Pilot
- Generation Pilot Radio Service
- None of the above

14. 10.EDGE stands for? * 1 point

Mark only one oval.

- Enhanced Data Rate for GSM Evolution
- Enhanced Data for GSM
- Enhanced Data for GSM Enhanced
- None of the above

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MC Online Quiz2 on Unit No.1

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1. Email address *

2. Class *

Mark only one oval.

- BE-A
- BE-B

3. Roll.No

4. Name of Student (Full Name)

5. 1.EDGE services are considered as _____ generation services? * 1 point

Mark only one oval.

- 2G
- 2.5G
- 3G
- None of the above

6. 2.Which country deployed the first GSM network? * 1 point

Mark only one oval.

- USA
- UK
- France
- Finland

7. 3.he type of switching used in a GSM network is _____? * 1 point

Mark only one oval.

- Circuit Switching
- Packet Switching
- A and B
- None

8. 4. The world's first GSM call was made on? * 1 point

Mark only one oval.

- 1990 July 1st
- 1991 July 1st
- 1992 July 1st
- 1993 July 1st

9. 5. Choose frequency band that was chosen to operate a GSM Network?? * 1 point

Mark only one oval.

- 900MHz
- 1800MHz
- 850, 1900MHz
- All the above

10. 6.Cryptographic algorithms used by GSM technology are _____?? * 1 point

Mark only one oval.

- A5/1
- A5/2
- A5/3
- All the above

11. 7.Which frequency band supports more coverage area in a GSM or 2G network? * 1 point

Mark only one oval.

- 1900MHz
- 1800MHz
- 900MHz
- None of the above

12. 8.Who developed standards for GSM technology? * 1 point

Mark only one oval.

- ANSI - American National Standards Institute
- ETSI - European Telecommunications Standards Institute
- IEEE - Institute of Electrical and Electronics Engineers
- None of the above

13. 9.What is the type signalling between Mobile Station and Base Transceiver Station in a 2G technology ? * 1 point

Mark only one oval.

- Analog
- Digital
- Discrete
- Dampened

14. 10.Which is the non European country operator to deploy GSM services? * 1 point

Mark only one oval.

- AT&T
- NTT
- Telecom Australia
- Docomo

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MC Online Quiz3 on Unit No.1

* Required

1. Email address *

2. Class *

Mark only one oval.

- BE-A
- BE-B

3. Roll.No

4. Name of Student (Full Name)

5. 1.3G W-CDMA is also known as? * 1 point

Mark only one oval.

- UMTS
- DECT
- DCS-1800
- ETACS

6. 2.Commonly used mode for 3G networks is? * 1 point

Mark only one oval.

- TDMA
- FDMA
- TDD
- FDD

7. 3. The minimum spectrum allocation required for W-CDMA is? * 1 point

Mark only one oval.

- 5MHz
- 2MHz
- 500KHz
- 100KHz

8. 4. CDMA2000 1xEV provides high speed data access with channel allocation of? * 1 point

Mark only one oval.

- 5MHz
- 50 MHz
- 1.25 MHz
- 4MHz

9. 5. In TD-SDMA, there is a frame of _____ milliseconds and the frame is divided into _____ time slots? * 1 point

Mark only one oval.

- 5, 7
- 7, 5
- 2, 5
- 5, 2

10. 6.The interference between the neighboring base stations is avoided by? * 1 point

Mark only one oval.

- Assigning different group of channels
- Using transmitters with different power level
- Using different antennas
- All of the above

11. 7.Radio capacity may be increased in cellular concept by? * 1 point

Mark only one oval.

- Increase in radio spectrum
- Increasing the number of base stations & reusing the channels
- Both a and b
- None of the above

12. 8.The shape for the cellular region for maximum radio coverage is? * 1 point

Mark only one oval.

- Circular
- Square
- Oval
- Hexagon

13. 9.Hexagon shape is used for radio coverage for a cell because? * 1 point

Mark only one oval.

- It uses the maximum area for coverage
- Fewer number of cells are required
- It approximates circular radiation pattern
- All of the above

14. 10.Centre excited hexagonal cells use? * 1 point

Mark only one oval.

- Sectored directional antennas
- Omni directional antennas
- Yagi uda antennas
- None of the above

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MC Online Quiz4 on Unit No.1

* Required

1. Email address *

2. Class *

Mark only one oval.

- BE-A
- BE-B

3. Roll.No

4. Name of Student (Full Name)

5. 1.Fading is caused due to? * 1 point

Mark only one oval.

- Multi path propagation
- Obstacles
- Frequency variations at the source
- Variation in amplitude and phase at receiver

6. 2.Coherence time refers to? * 1 point

Mark only one oval.

- Time required to attain a call with the busy base station
- Time required for synchronization between the transmitter and the receiver
- Minimum time for change in magnitude and phase of the channel
- None of the above

7. 3. Fading due to shadowing is? * 1 point

Mark only one oval.

- Fading due to large obstructions
- Large coherence time of the channel as compared to the delay constraints
- Small coherence time of the channel as compared to the delay constraints
- Both a) and b)
- Both a) and c)

8. 4. Deep fade is? * 1 point

Mark only one oval.

- Strong destructive interference
- Drop in signal to noise ratio
- Temporary failure of message transfer
- All of the above

9. 5. Doppler spread refers to? * 1 point

Mark only one oval.

- Signal fading due to Doppler shift in the channel
- Temporary failure of message transfer
- Large coherence time of the channel as compared to the delay constraints
- All of the above

10. 6.The techniques used for small scale multipath measurements are? * 1 point

Mark only one oval.

- Direct RF pulse system
- Spread spectrum sliding correlator channel sounding
- Frequency domain channel sounding
- All of the above

11. 7.Direct RF pulse system helps in calculating? * 1 point

Mark only one oval.

- impulse response in frequency domain
- impulse response in phase domain
- power delay of the channel
- all of the above

12. 8.Impulse response of a multipath channel is determined by the fact that? * 1 point

Mark only one oval.

- Mobile radio channel may be modeled as linear filter
- Impulse response is time varying
- Both a) and b)
- None of the above

13. 9.The received signal from a multipath channel is expressed as? * 1 point

Mark only one oval.

- convolution of transmitted signal and impulse response
- addition of transmitted signal and impulse response
- subtraction of transmitted signal and impulse response
- none of the above
- all of the above

14. 10.Tpes of small scale fading, based on Doppler spread are? * 1 point

Mark only one oval.

- Fast fading
- frequency non selective fading
- Flat fading
- Frequency selective fading

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MC Online Quiz5 on Unit No.1

* Required

1. Email address *

2. Class *

Mark only one oval.

- BE-A
- BE-B

3. Roll.No

4. Name of Student (Full Name)

5. 1.What are the three main parts of a GSM Architecture or Structure?? * 1 point

Mark only one oval.

- Mobile Station
- BSS - Base Station Subsystem
- NSS - Network and Switching Subsystem
- All the above

6. 2.What are the main parts of a Mobile Station in a GSM Network? * 1 point

Mark only one oval.

- MT - Mobile Terminal
- SIM - Subscriber Identity Module
- Both A and B
- None

7. 3. What are the main parts of a BSS (Base Station Subsystem) in a GSM network? * 1 point

Mark only one oval.

- BTS - Base Transceiver Station
- BSC - Base Station Controller
- A and B
- None

8. 4. What are the main parts of a NSS (Network and Switching Subsystem) of a GSM Architecture? * 1 point

Mark only one oval.

- MSC - Mobile Switching Center
- HLR & AuC
- VLR, EIR
- All the above

9. 5. What are the main parts of an MSC (Mobile Switching Center) system in a GSM structure? * 1 point

Mark only one oval.

- MGW - Media Gateway
- MSC Server
- Both A and B
- None

10. 6.A GPRS Core network is part of System in a GSM Network Structure? * 1 point

Mark only one oval.

- Mobile Station
- BSS
- MSS
- NSS

11. 7.A BTS is also called _____ by general public? * 1 point

Mark only one oval.

- Mobile tower
- Exchange
- Charging Point
- None

12. 8.Each Mobile Terminal is identified by a unique _____ number? * 1 point

Mark only one oval.

- IMEI
- SIM
- IMSI
- None

13. 9.IMEI stands for? * 1 point

Mark only one oval.

- Internal Mobile Equipment Identity
- International Mobile Equipment Identity
- Intra Mobile Enable Identity
- None

14. 10.Each SIM is identified by a unique _____ number? * 1 point

Mark only one oval.

- IMSI
- IMEI
- MSDN
- None

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MC Online Quiz6 on Unit No.2

* Required

1. Email address *

2. Class *

Mark only one oval.

- BE-A
- BE-B

3. Roll.No

4. Name of Student (Full Name)

5. 1.IMSI stands for? * 1 point

Mark only one oval.

- Internal Mobile Subscriber Identity
- International Mobile Subscriber Identity
- Investigating Mobile Subscriber Identity
- None

6. 2.Your mobile number is actually called _____ number. * 1 point

Mark only one oval.

- IMSI
- SIM
- Both A and B
- None

7. 3. IMSI number of a SIM is also called? * 1 point

Mark only one oval.

- MSISDN
- IMEI
- ICCID
- None

8. 4. What controller a group of BTS or Cell Towers? * 1 point

Mark only one oval.

- BSC
- MSC
- HLR
- VLR

9. 5. How many digits of PIN (Personal Identification Number) is allowed to protect a SIM card? * 1 point

Mark only one oval.

- 4
- 8
- 10
- None

10. 6.What is PUK code of a SIM? * 1 point

Mark only one oval.

- PIN Unlock Key
- 4 digit code
- It is like a password to enter after inserting SIM in a mobile for the first time. It prevents misuse.
- All

11. 7.The only element that personalises a Mobile Station is _____? * 1 point

Mark only one oval.

- Back cover
- SIM
- Screen guard
- None

12. 8.What is the maximum number of Transceivers a BTS can handle is ? * 1 point

Mark only one oval.

- 8
- 12
- 16
- 22

13. 9.What are the functions of a BSC? * 1 point

Mark only one oval.

- Handovers, exchange functions
- Frequency hopping
- Control of radio frequency power level of BTS
- All

14. 10.What is the main function of NSS? * 1 point

Mark only one oval.

- Establishing communication between mobile and landline numbers.
- Providing eligible services to the subscriber
- Providing parameters for Authentication and Encryption
- All

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MC Online Quiz7 on Unit No.3

* Required

1. Email address *

2. Class *

Mark only one oval.

- BE-A
- BE-B

3. Roll.No *

4. Name of Student (Full Name) *

5. 1. ASK modulated signal has the bandwidth? *

Mark only one oval.

- Same as the bandwidth of baseband signal
- Half the bandwidth of baseband signal
- Double the bandwidth of baseband signal
- None of the above

6. 2.In On- Off keying, the carrier signal is transmitted with signal value 1 and '0' indicates? *

Mark only one oval.

- No carrier
- Half the carrier amplitude
- Amplitude of modulating signal
- None of the above

7. 3.Coherent detection of binary ASK signal requires.? *

Mark only one oval.

- Phase synchronization
- Timing synchronization
- Amplitude synchronization
- Both a) and b)

8. 4. In Binary Phase Shift Keying system, the binary symbols 1 and 0 are represented by carrier with phase shift of? *

Mark only one oval.

- Π/2
- Π
- 2Π
- 0

9. 5.BPSK system modulates at the rate of? *

Mark only one oval.

- 1 bit/ symbol
- 2 bit/ symbol
- 4 bit/ symbol
- None of the above

10. 6.QPSK is a modulation scheme where each symbol consists of? *

Mark only one oval.

- 4 bits
- 2 bits
- 1 bit
- M number of bits, depending upon the requirement

11. 7. The data rate of QPSK is _____ of BPSK. ? *

Mark only one oval.

- Thrice
- Four times
- Twice
- same
- Option 5

12. 8.Most modern modems use...for digital to analog modulation? *

Mark only one oval.

- ASK
- PSK
- FSK
- QAM

13. 9.In which type of modulation bit rate is four times the baud rate? *

Mark only one oval.

- ASK
- FSK
- PSK
- None of the above

14. 10.On 16 QAM Constellation diagram each constellation points reprents? *

Mark only one oval.

- dibit
- tribit
- quadbit
- pentabit

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MC online Quiz8 on Unit No.3

* Required

1. Email address *

2. Class *

Mark only one oval.

- BE-A
- BE-B

3. Roll.No *

4. Name of Student (Full Name) *

5. 1.The minimum bandwidth for an sk modulated signal with baud rate of 5000 is ....HZ?

Mark only one oval.

- 1000
- 25000
- 50000
- 100000

6. 2.For...the minimum bandwidth required for transmission is equal to the baud rate? *

Mark only one oval.

- ASK
- PSK
- FSK
- a and b

7. 3.The modulation technique most affected by noise is..? *

Mark only one oval.

- ASK
- PSK
- FSk
- QAM

8. 4.OOK is ...type of modulation?

Mark only one oval.

- ASK
- PSk
- FSk
- QAm

9. 5....rate is always less than or equal to ...rate? *

Mark only one oval.

- Baud; Bit
- Bit; Baud
- Baud; Base
- Base; Baud

10. 6.Which type of user interface provide input by typing a string in the keyboard ?Which of the following is not a property of spread spectrum techniques?

Mark only one oval.

- Interference rejection capability
- Multipath fading
- Frequency planning elimination
- Multiple user, multiple access interface

11. 7.Which of the following is not a characteristic of PN sequence? *

Mark only one oval.

- Nearly equal number of 0s and1s
- Low correlation between shifted version of sequence
- Non deterministic
- Low cross-correlation between any two sequences

12. 8. Low cross-correlation between any two sequences? *

Mark only one oval.

- True
- False

13. 9.Frequency hopping involves a periodic change of transmission...? *

Mark only one oval.

- Signal
- Frequency
- Phase
- Amplitude

14. 10.What is the set of possible carrier frequencies in FH-SS? *

Mark only one oval.

- Hopset
- Hop
- Chips
- Symbols

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MC online Quiz9 on Unit No.3

* Required

1. Email address *

2. Class *

Mark only one oval.

- BE-A
- BE-B

3. Roll.No *

4. Name of Student (Full Name) *

5. 1. FH systems do not have collisions.? *

Mark only one oval.

- True
- False

6. 2. Why spread spectrum technique is inefficient for a single user? *

Mark only one oval.

- Large transmission bandwidth
- Small transmission bandwidth
- Fixed transmission bandwidth
- Fixed null bandwidth

7. 3.TDMA stands for *

Mark only one oval.

- Time Domain Multiple Access
- Time-Division Multiple Access
- Tone Division Multiple Access
- none of the above

8. 4.Spread-spectrum can be done by using? *

Mark only one oval.

- computer-controlled frequency reuse
- frequency-hopping
- direct-sequence method
- all of the above

9. 5.A receiver for frequency-hopping spread-spectrum would be? *

Mark only one oval.

- a narrowband receiver
- a wideband receiver
- a direct-conversion receiver
- a CDMA receiver

10. 6. Some advantages of spread spectrum are? *

Mark only one oval.

- Low susceptibility
- Immunity to jamming
- Reduced interference
- All of the mentioned

11. 7.Which is better for avoiding jamming? *

Mark only one oval.

- Direct sequence spread spectrum
- Frequency hopping spread spectrum
- Time hopping spread spectrum
- None of the mentioned

12. 8.CDMA rejects *

Mark only one oval.

- Narrow band interference
- Wide band interference
- Narrow & Wide band interference
- None of the mentioned

13. 9.Frequency planning is very essential in? *

Mark only one oval.

- FDMA
- TDMA
- FDMA & TDMA
- None of the mentioned

14. 10.CDMA uses? *

Mark only one oval.

- Hard hand off
- Soft hand off
- Hard & Soft hand off
- None of the mentioned

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BE (E&TC) – Mobile Communication Multiple Choice Questions (MCQ) Unit I - Switching techniques for Voice and Data

If ‘n’ number of users are present in a network with point-to-point links, then how many links will be required in the network?
a. n (n – 1)
b. n (n – 1) / 2 c. n (n – 1) /
4 d. n (n – 1) / 8
ANSWER: (b) n (n – 1) / 2

Which among the following is/are adopted by cross bar systems with hard wired control subsystem?
a. Relays
b. Latches
c. Both a and b
d. None of the above
ANSWER: (c) Both a and b

Which kind of switching technique indicates the transfer of coded values from input to output during the same interval of time?
a. Space Switching
b. Time Switching
c. Combination Switching d.
None of the above ANSWER:
(a) Space Switching

What is the hardware, used to establish connection as an electrical path between inlet and outlet pair in switching system, known as?
a. Switching Matrix
b. Switching Network
c. Both a and b
d. None of the above
ANSWER: (c) Both a and b

5) In folded type of network, ____
a. input lines are folded back to output lines
b. output lines are folded back to input lines
c. input lines are folded back to themselves (input lines) d.
output lines are folded back to themselves (output lines)
ANSWER: (b) output lines are folded back to input lines

The ratio of number of successful calls to the number of call attempts is known as _____
a. Call Completion Rate (CCR)
b. Call Block Rate (CBR)
c. Busy Hour Call Rate (BHCR)
d. None of the above
ANSWER: (a) Call Completion Rate (CCR)

If a telephone exchange serves 1500 users with the average BHCA of about 9000 and CCR is about 50%, what would be the busy hour calling rate?
a. 2 b. 3 c. 4.5 d.
5 ANSWER: (b)
3

How is the relation between Erlang and CCS specified?
a. 1 Erlang = 36 CCS
b. 1 Erlang = 56 CCS
c. 1 Erlang = 76 CCS
d. 1 Erlang = 96 CCS
ANSWER: (a) 1 Erlang = 36 CCS

Percentage of occupancy can be defined as the percentage of _____ for which the server seems to be busy.
a. speed b.
distance c.
time
d. volume

ANSWER: (c) time

By which name/s is the Grade of Service (GOS) well-known? a.
Call congestion
b. Time congestion
c. Both a and b
d. None of the above
ANSWER: (a) Call congestion

Which among the following provides TRG access to outgoing junctions through the two stage network?
a. Expander b.
Distributor c.
Concentrator d.
Router ANSWER: (d)
Router

Which shape of switches are not adopted normally due to non-usability of both way trunks?
a. Circular b.
Triangular c.
Hexagonal
d. Square
ANSWER: (b) Triangular

In graded groups, switches with inaccessibility to the outgoing route gets ____ into the number of separate groups.
a. added
b. subtracted
c. multiplied
d. divided
ANSWER: (c) multiplied

Which form/s of grading design has/have the tendency to share every trunk between equal number of groups?
a. Homogeneous Grading
b. Heterogeneous Grading

c. Skipped Grading
d. All of the above
ANSWER: (a) Homogeneous Grading

For the two-group grading consisting of 14 trunks, availability = 5, A_k = 1.4E and the required grade of service of about 0.01, what would be its traffic capacity?
a. 4.98 E
b. 6.72 E
c. 8.3 E
d. 10 E
ANSWER: (a) 4.98 E

Which among the following controls the dynamic characteristics of Phase Locked Loop (PLL)?
a. Low Pass Filter b. High
Pass Filter c. Band Pass Filter
d. Band Stop Filter ANSWER:
(a) Low Pass Filter

After the application of line frequency in Phase Locked Loop (PLL), at which stage do/ does the VCO frequency start to exhibit variation?
a. Free running
b. Capture
c. Phase Lock
d. All of the above
ANSWER: (b) Capture

What is an acceptable value of dividing point between the wander and jitter?
a. 10 Hz b. 20 Hz c.
50 Hz d. 200 Hz
ANSWER:(a) 10
Hz

If the voltage controlled by VCO exhibits variation at faster and rapid rate, then the instability of clock is known as _____
a. Clock wander
b. Clock jitter
c. Clock frequency d.
Clock period ANSWER:
(b) Clock jitter

Which theorem in random jitter specifies the composite effect of various uncorrelated noise sources despite the distribution approaches to Gaussian distribution?
a. Initial Value Theorem
b. Final Value Theorem c.
Central Limit Theorem d.
None of the above
ANSWER: (c) Central Limit Theorem

Which type of data network supports the interconnection of computers within highly populated area?
a. LAN
b. WAN
c. MAN
d. None of the above
ANSWER: (c) MAN

Which among the following is/are supported by LAN?
PABX
PSTN
SBDN
All of the above
ANSWER: (a) PABX

If the voice channel is free in PSTN, then what would be the maximum data rate supported by 3.1 kHz bandwidth of voice channel?
a. 2000 bps
b. 4000 bps
c. 6000 bps
d. 8000 bps

ANSWER: (c) 6000 bps

In Phase Shift Keying, how many bit/s is/are allowed to be transmitted per shift?
a. 1 b. 2 c. 4 d. 8
ANSWER: (b) 2

Which among the following utilizes the transmission line upto 85 – 95 %? a. Voice Traffic
b. Data Traffic
c. Both a and b
d. None of the above
ANSWER: (a) Voice Traffic

If the system is designed with the usage of hexagonal-shaped cells, how are the base-stations located?
a. At the centre of cell
b. At the edge of cell
c. At the corner of the cell d.
All of the above ANSWER:
(d) All of the above

Which antennas are used at the center of the cells for the system with hexagonal-shaped cells?
a. Omni-directional antennas
b. Sectored directional
antennas c. Both a and b
d. None of the above
ANSWER: (a) Omni-directional antennas

In a cellular telephone system, which type of interference results from imperfect design of filters in receivers by allowing nearby frequencies to enter the receiver?
a. Co-channel Interference
b. Adjacent-channel Interference

c. Both a and b
d. None of the above
ANSWER: (b) Adjacent-channel Interference

Which effect is widespread in adjacent-channel interference especially after the reception of a weak signal by a mobile user from the base-station? a. Near-far effect
b. Doppler's effect c. Capture
effect d. Kendall effect
ANSWER: (a) Near-far
effect

Which method of cellular network assists in minimizing the co-channel interference associated with the angle of degree?
a. Cell Splitting
b. Cell Sectoring
c. Cell Segmentation &
Dualization d. None of the above
ANSWER: (b) Cell Sectoring

Which type of connection takes place between an incoming trunk and an outgoing trunk?
a. Local call
b. Outgoing call c.
Incoming call d. Transit
call ANSWER: (d)
Transit call

In message switching system, an incoming message gets ____ especially if the required route is busy.
a. lost
b. stored in a queue &
retransmitted c. sampled
d. recovered
ANSWER: (b) stored in a queue & retransmitted
Which type of switching network involves the establishment of a dedicated path between two stations?

a. Message Switching
b. Packet Switching
c. Circuit Switching
d. Manual Switching
ANSWER: (c) Circuit Switching

In packet switching, what does the header of each short size of packet consist of?
a. Source address
b. Destination address c. Intermediate nodes d. All of the above ANSWER: (d) All of the above

In manual switching, which kind of battery exchange has the provision of subscribers set along with magneto generator?
a. Local battery exchange
b. Central battery exchange
c. Both a and b
d. None of the above
ANSWER: (a) Local battery exchange

If a group of trunk is offered 1200 calls during the busy hour & 20 calls are lost along with the average call duration of about 7 min, then what would be the total duration of congestion period?
a. 21.6 sec b. 42.2 sec
c. 57.6 sec d. 98.2 sec
ANSWER: (c) 57.6 sec

In analyzing the traffic performance, how is the number of trunk decided with the provision of the Grade of Service (GoS) especially for larger group? a. By normal load condition
b. By overload condition
c. By underload condition
d. None of the above
ANSWER: (b) By overload condition

If the queuing systems are connected in tandem configuration, what would be the nature of delay?
a. Commutative b.
Distributive c. Cumulative
d. Deductive ANSWER:
(c) Cumulative

Which type of holding time distribution is assumed for the voice conversation on telephone?
a. Constant
b. Exponential
c. Both a and b
d. None of the above
ANSWER: (b) Exponential

Which model of loss system allows the usage of Poisson distribution model for traffic analysis especially by assuming infinite number of users? a. Lost Calls Cleared (LCC)
b. Lost Calls Returned (LCR)
c. Lost Calls Held (LCH)
d. None of the above
ANSWER: (a) Lost Calls Cleared (LCC)

In two-stage network, which phenomenon/situation occurs due to impossible connectivity of given incoming trunk to selected outgoing trunk specifically because of link utilization for other connection between primary and secondary switches?
a. Bursting b. Blinking
c. Blocking d. Burning
ANSWER: (c) Blocking

Which kind of switching system does not comprise any subscriber, concentrator or expander?

Crossbar
Director Exchange
Strowger
Tandem
ANSWER: (d) Tandem

By how many times does the time division exchange exhibit connection and disconnection with respect to every millisecond, due to its ability of using rearrangeable networks?
a. 2 b. 4 c. 8 d.
16 ANSWER:
(c) 8

Which signals are regarded as call-progress signals as they are sent back to inform the caller about the progress of the call?
a. Address Signals
b. Status Signals
c. Call request Signals d.
Answer Signals ANSWER:
(b) Status Signals

Which among the following exhibit/s the necessity of trunks during the signaling mechanism?
a. Inchannel Signaling
b. Common Channel Signaling
c. Both a and b
d. None of the above
ANSWER: (a) Inchannel Signaling

Phase jitter is generated by an additive noise on a _____sinusoidal wave.
a. continuous
b. sampled c.
discrete d.
distorted
ANSWER: (a) continuous

What is /are the purpose/s of pulse stuffing in an asynchronous multiplexing?
a. Removal of slips & the need for clock synchronization
b. Usability of output channel with higher rate than input
c. Creation of timing adjustments
d. All of the above
ANSWER: (d) All of the above

In digital network synchronization, which approach indicates the cost burden carrying of highly accurate and redundant timing sources by means of smaller switching nodes?
a. Packetization
b. Master Slave Clocking
c. Network Wide Pulse Stuffing d.
Plesiochronous Network ANSWER: (d)
Plesiochronous Network

If the desired connection has a low completion probability, which type of flow control technique is used for eliminating the capture of common resources?
a. Trunk Directionalization
b. Cancellation of Alternate
Routing c. Code Blocking
d. Centralized Connection Control
ANSWER: (d) Centralized Connection Control

In network management, managing the rate at which the traffic enters a network is known as _____
a. Flow control
b. Routing control
c. Data control
d. All of the above
ANSWER: (a) Flow control

Which among the following can be adopted as a dedicated path between the source and destination in circuit switching?

a. Physical Wire
b. Radio Link
Co-axial Cable
All of the above
ANSWER: (d) All of the above

The transfer of user messages from node to another by means of store and forward switching network is known as _____
a. jitter b. scaling c.
hop d. entity
ANSWER: (c) hop

Consider the statements given below. Which among them represents the operational step executed in datagram Packet Switched Network?
a. Fixed Path is assigned between nodes from source to destination
b. First Come First Serviced basis is applicable
c. Necessity of an identifier for a connection between source host & destination host
d. Transmission of short messages of one or two packet length
ANSWER: (d) Transmission of short messages of one or two packet lengths

In Protocol Data Units (PDUs), where do/does the data get/s interchanged? a. Between peer entities
b. Between entities of neighboring
layers c. Between ‘N’ & ‘N+1’ layers
d. All of the above
ANSWER: (a) Between peer entities

Which type of framing technique/s reduce/s the problem of synchronization of the receiver?
a. Character Count b.
Character Stuffing c.
Bit Stuffing
d. All of the above
ANSWER: (b) Character Stuffing

If more number of cells are necessary in the frequency reuse distance, then the segmentation & dualization techniques get _____
a. united b. divided
c. restricted d.
filtered ANSWER:
(a) united

Which hand-off stage deals with the relinquishment of unnecessary frequency channels by keeping the availability for other mobile users?
a. Initialization
b. Resource Reservation
c. Call Execution
d. Call Completion
ANSWER: (d) Call Completion

Which among the following represents the flawless hand-off with no perceivable interruption of service?
a. Hard hand-off
b. Soft hand-off
c. Intracell hand-off d.
Intercell hand-off ANSWER:
(b) Soft hand-off

In cellular telephone network, which component controls the switching between public wireline telephone network and the base station of cells for supporting the different calls between landline to mobile, mobile to landline and mobile to mobile calls?
a. Electronic Switching Center (ESC)
b. A Cell Controller
c. Radio Transmitter & Receiver
d. A common communication protocol
ANSWER: (a) Electronic Switching Center (ESC)

In Electronic Switching Centre (ESC), the transmission rate of X.25 protocol is ____9.6 Kbps.
a. Less than
b. Equal to

c. Greater than
d. None of the above
ANSWER: (c) Greater than

Which type of connection takes place between an incoming trunk and an outgoing trunk?
a. Local call
b. Outgoing call
c. Incoming call
d. Transit call
ANSWER: d. Transit call

In message switching system, an incoming message gets ____ especially if the required route is busy.
a. lost
b. stored in a queue &
retransmitted c. sampled
d. recovered
ANSWER: b. stored in a queue & retransmitted

Which type of switching network involves the establishment of a dedicated path between two stations?
a. Message Switching b.
Packet Switching c. Circuit
Switching d. Manual
Switching Answer: c. Circuit
Switching

In packet switching, what does the header of each short size of packet consist of?
a. Source address
b. Destination address c.
Intermediate nodes d. All of
the above ANSWER: d. All
of the above

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a. Local battery exchange

b. Central battery exchange
c. Both a and b
d. None of the above
ANSWER: a. Local battery exchange

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sec c. 57.6 sec d.
98.2 sec ANSWER:
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In analyzing the traffic performance, how is the number of trunk decided with the provision of the Grade of Service (GoS) especially for larger group? a. By normal load condition
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If the queuing systems are connected in tandem configuration, what would be the nature of delay?
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Distributive c.
Cumulative d.
Deductive ANSWER: c.
Cumulative

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a. Constant
b. Exponential
c. Both a and b
d. None of the above
ANSWER: b. Exponential

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a. Bursting b.
Blinking c. Blocking
d. Burning ANSWER:
c. Blocking

Which kind of switching system does not comprise any subscriber, concentrator or expander?
a. Crossbar
b. Director Exchange
c. Strowger
d. Tandem ANSWER:
d. Tandem

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16 ANSWER:
c. 8

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b. sampled c.
discrete d.
distorted
ANSWER: a. continuous

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b. Usability of output channel with higher rate than input
c. Creation of timing adjustments
d. All of the above ANSWER:
d. All of the above

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b. Master Slave Clocking
c. Network Wide Pulse Stuffing d.
Plesiochronous Network ANSWER:
d. Plesiochronous Network

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b. Cancellation of Alternate
Routing c. Code Blocking
d. Centralized Connection Control ANSWER:
d. Centralized Connection Control

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b. Routing control
c. Data control
d. All of the above
ANSWER: a. Flow control

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a. Physical Wire
b. Radio Link
c. Co-axial Cable d. All of
the above ANSWER: d. All
of the above

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c. hop d. entity
ANSWER: c. hop

Consider the statements given below. Which among them represents the operational step executed in datagram Packet Switched Network?
a. Fixed Path is assigned between nodes from source to destination
b. First Come First Serviced basis is applicable
c. Necessity of an identifier for a connection between source host & destination host
d. Transmission of short messages of one or two packet lengths

ANSWER: d. Transmission of short messages of one or two packet lengths

In Protocol Data Units (PDUs), where do/does the data get/s interchanged? a. Between peer entities
b. Between entities of neighboring
layers c. Between 'N' & 'N+1' layers
d. All of the above
ANSWER: a. Between peer entities

Which type of framing technique/s reduce/s the problem of synchronization of the receiver?
a. Character Count b.
Character Stuffing c.
Bit Stuffing
d. All of the above
ANSWER: b. Character Stuffing

If more number of cells are necessary in the frequency reuse distance, then the segmentation & dualization techniques get _____
a. united b. divided
c. restricted d.
filtered ANSWER:
a. united

Which hand-off stage deals with the relinquishment of unnecessary frequency channels by keeping the availability for other mobile users?
a. Initialization
b. Resource Reservation
c. Call Execution
d. Call Completion ANSWER:
d. Call Completion

Which among the following represents the flawless hand-off with no perceivable interruption of service?
a. Hard hand-off
b. Soft hand-off
c. Intracell hand-off
d. Intercell hand-off

ANSWER: b. Soft hand-off

In cellular telephone network, which component controls the switching between public wireline telephone network and the base station of cells for supporting the different calls between landline to mobile, mobile to landline and mobile to mobile calls?

a. Electronic Switching Center (ESC)
b. A Cell Controller
c. Radio Transmitter & Receiver
d. A common communication protocol

ANSWER: a. Electronic Switching Center (ESC)

In Electronic Switching Centre (ESC), the transmission rate of X.25 protocol is ____9.6 Kbps.

a. Less than
b. Equal to
c. Greater than
d. None of the above

ANSWER: c. Greater than

BE (E&TC) – Mobile Communication

Multiple Choice Questions (MCQ) Unit II -

Traffic Engineering and Signalling

If a group of trunk is offered 1200 calls during the busy hour & 20 calls are lost along with the average call duration of about 7 min, then what would be the total duration of congestion period?
a. 21.6 sec b. 42.2 sec
c. 57.6 sec d. 98.2 sec
ANSWER: c. 57.6 sec

Explanation:
No explanation is available for this question!

Which model of loss system allows the usage of Poisson distribution model for traffic analysis especially by assuming infinite number of users?
a. Lost Calls Cleared (LCC) b.
Lost Calls Returned (LCR) c.
Lost Calls Held (LCH)
d. None of the above
ANSWER: a. Lost Calls Cleared (LCC)

Which type of holding time distribution is assumed for the voice conversation on telephone? a. Constant
b. Exponential
c. Both a and b
d. None of the above
ANSWER: b. Exponential

If the queuing systems are connected in tandem configuration, what would be the nature of delay?
a. Commutative b.
Distributive c.
Cumulative d. Deductive
ANSWER: c.
Cumulative

In analyzing the traffic performance, how is the number of trunk decided with the provision of the Grade of Service (GoS) especially for larger group?
a. By normal load condition
b. By overload condition

c. By underload condition
d. None of the above
ANSWER: a. By overload condition

By which name/s is the Grade of Service (GOS) well-known? a.
Call congestion
b. Time congestion
c. Both a and b
d. None of the above
Answer Explanation
ANSWER: Call congestion

Percentage of occupancy can be defined as the percentage of _____ for which the server seems to be busy.
a. speed b.
distance c.
time
d. volume
ANSWER: c. time

How is the relation between Erlang and CCS specified?
a. 1 Erlang = 36 CCS
b. 1 Erlang = 56 CCS
c. 1 Erlang = 76 CCS
d. 1 Erlang = 96 CCS
ANSWER: a. 1 Erlang = 36 CCS

If a telephone exchange serves 1500 users with the average BHCA of about 9000 and CCR is about 50%, what would be the busy hour calling rate?
a. 2 b. 3 c. 4.5
d. 5 ANSWER:
b. 3

The ratio of number of successful calls to the number of call attempts is known as _____
a. Call Completion Rate (CCR)
b. Call Block Rate (CBR)
c. Busy Hour Call Rate
(BHCR) d. None of the above
ANSWER: a. Call Completion Rate (CCR)

In International Telephone Numbering, a digit or combination of digits characterizing the called numbering area within a country is called _____ code.
a. Local

CCITT
Baudot
Area
View Answer:
Answer: Option D

Solution:

The last two digits of the loaded cable designation 22E66 indicates a.
Spacing
b. Coil inductance
c. Wire gauge
d. Attenuation
View Answer:
Answer: Option B

Solution:

A condition of a telephone handset, in which it can be called, is _____ condition. a.
On-hook
b. Off-hook
c. Busy
d. None of these
View Answer:
Answer: Option A

Solution:

When digits 3 is dialed using touch tone system, the amount of time needed to send the tone is
a. 0.1 sec b. 50
msec c. 0.25 sec
d. 0.25 sec View
Answer: Answer:
Option B

Solution:

A telephone number perform the following operations except a.
To route the call
b. To activate the necessary apparatus for proper call
charging c. To order clearing of connection
d. None of the above
View Answer:
Answer: Option C

Solution:

The number to be dialed or called to reach a subscriber in the same local network or numbering area is
a. Local code
b. Area code
c. Toll access code
d. Subscriber No.
View Answer:
Answer: Option D

Solution:

That part of the telephone network between the telephone instrument at the subscriber premises and the central office equipment is called the _____.
a. Inter-office
trunk b. Tie line
c. Subscriber loop
d. Service drop
wire View Answer:
Answer: Option C

Solution:

A line linking telephone central offices is called _____ line. a.
Tie
b. Inter-office trunk
c. Routing
d. Connector View
Answer: Answer:
Option B

Solution:

A signalling technique wherein a number of voice paths is carried over one common channel instead of having individual voice channels.
a. In band signalling
b. Out of band signalling
c. Common channel signalling
d. Alternate channel signalling

View Answer:
Answer: Option C

Solution:

_____ is a unit of telephone traffic defined as one user making a call of one second duration.
a. CCS
b. Call-second
c. Erlangs
d. Call-hour View
Answer: Answer:
Option B

Solution:

During a busy hour in a telephone system an average of one call is lost, then the grade of service is considered to be:
a. 1.01 b. 10% c.
0.10% d. 0.01
View Answer:
Answer: Option D

Solution:

If a busy counts are made during the span of 15 minutes, and the average number of occupied circuit is found to be 8, then the traffic, in Erlang, is:
a. 2
b. 8
c. 6
d. 4
View Answer:
Answer: Option A

Solution:

In a standard CCITT group, 12 channels FDM, the carrier frequency of the channel No. 1 is _____.
a. 100 kHz
b. 102 kHz c. 108
kHz d. 60 kHz
View Answer:
Answer: Option C

Solution:

24. In the FDM hierarchy, a mastergroup is composed of ten supergroups and is equivalent to

a. 600 channels
b. 60 channels
c. 180 channels
d. 120 channels
View Answer:
Answer: Option A

Solution:

The approximation process in PCM creates noise called: a.
Thermal
b. White noise
c. Quantizing noise
d. Agitation noise
View Answer:
Answer: Option C

Solution:

The criteria to be considered in designing a telephone system a.
Attenuation limit
b. Resistance limit
c. A or B
d. A and B View
Answer: Answer:
Option D

Solution:

This refers to loop AC reference frequency measured in decibels a.
Signalling limits
b. Resistance limits
c. Attenuation
limits d. All of
these View Answer:
Answer: Option C

Solution:

An inuction coil which is multiple winding transformer intended to interface a 2-wire circuit to be a 4-wire circuit to permit two-way transmission of signals.
a. Hybrid function
b. Speech transformer
c. Transmission regulation
circuit d. A or B

View Answer:
Answer: Option D

Solution:

A subscriber loop signalling method in which signalling information is indicated by the presence and absence of a battery and ground condition on the line at the called end of the trunk. a. Wet-Dry
b. Reverse Battery
c. High-Low
d. Supervisory
View Answer:
Answer: Option A

Solution:

An arrangement where the only possible connection between a number of exchanges is through a single tandem or transit exchange where they are all connected.
a. Mesh
b. Star
c. Composite d.
Ring View
Answer: Answer:
Option B

Solution:

CCITT recommendation E-161 recommends that not more than _____ digits make up an international number, excluding the international prefix.
a. 10
b. 12
c. 16
d. 20
View Answer:
Answer: Option B

Solution:

The following are the transmission media used for telephone systems except: a.
Parallel wire
b. Coaxial wire c.
Fiber optics d.
None of these
View Answer:
Answer: Option D

Solution:

The subscriber loop provides the following except: a.
Talk battery
b. Ringing voltage
c. Telephone dial
d. Current during on hook
View Answer:
Answer: Option D

Solution:

A method of multiplexing in which the total frequency spectrum available is used by each channel, but not part of the time.
a. FDM b. TDM
c. SDM d. GSM
View Answer:
Answer: Option B

Solution:

The primary cause of echo and singing is a.
Intermodulation noise
b. Crosstalk
c. Impedance mismatch
d. Thermal noise View
Answer: Answer:
Option C

Solution:

For crosstalk to be considered intelligible, at least _____ words are intelligible to the listener in a seven second period.
a. 5
b. 6
c. 4
d. 3
View Answer:
Answer: Option C

Solution:

Noise that is non-continuous, consisting of irregular pulse or noise spikes of short duration and of relatively high amplitude.

Solar
Intermodulation
Impulse
Crosstalk
View Answer:
Answer: Option C

Solution:

The signal to noise ratio for voice based on customer satisfaction is a.
30 db
b. 35 db c. 15 db
d. 20 db View
Answer: Answer:
Option A

Solution:

dBa is a noise unit which uses a tone of 1000 Hz and a power level of a.
-85 dBm
b. -90 dBm
c. 85 dBm
d. -80 dBm

View Answer:
Answer: Option A

Solution:

The average intensity in one or more traffic paths occupied in the busy hour by one 2-minute call for an aggregate duration of two minutes.
a. CCS b. Cm c.
Erlang d. EBHC
View Answer:
Answer: Option D

Solution:

A method of handling lost calls wherein a call failing to immediately find a server, waits enters a queue until one becomes available.
a. Lost Calls Cleared
b. Lost Calls Held c.
Lost Calls Delayed

d. None of these
View Answer:
Answer: Option C

Solution:

The main terminal used as cross connection point for cables 300 pairs and above. a.
MTTC
b. MDF
c. DP d.
TTC
View Answer:
Answer: Option B

Solution:

For PCM, the sampling theorem states that the sampling frequency must be _____ the highest frequency contained in the analog signal.
a. twice
b. more than
twice c. less than
twice d. equal to
View Answer:
Answer: Option B

Solution:

a group of sixty voice channels with bandwidth of 240 kHz is called a a.
group
b. supergroup c.
mastergroup d.
jumbogroup View
Answer: Answer:
Option B

Solution:

On the subscriber's telephone set employing the touch tone technique, how many signals are transmitted to the telephone exchange for every button that is pressed?
a. 2 VHF signals b.
1 VHF and 1 AF c.
2 AF tones
d. 16 AF tones
View Answer:
Answer: Option C

Solution:

An electronic circuit which is inserted into the 4-wire trunk path effectively to block the passage of reflected signal energy
a. Echo suppressor
b. Loading coil
c. Loop extender
d. Telephone amplifier
View Answer:
Answer: Option A

Solution:

The following are signalling functions except: a.
Ringing signals
b. Address signals
c. Supervisory signals
d. None of these
View Answer:
Answer: Option D

Solution:

The standard spacing for 19-D-88 cable loading code is a.
700 ft.
b. 6000 ft.
c. 4500 ft.
d. 3000 ft.
View Answer:
Answer: Option C

Solution:

A telephone exchange has a subscriber loop limit of 1800 ohms, excluding the telephone instrument. What is the farthest distance, in miles, that a subscriber can be located away from the telephone exchange, if AWG 26 cable, which has a resistance of 431 ohms/loop mile, is used? a. 5.95
b. 8.18
c. 3.9
d. 4.18
View Answer:
Answer: Option D

Solution:

50. The Strowger or step-by-step system falls under what type of switching control system?

Manual
Progressive
Common
Automatic View
Answer: Answer:
Option B

Solution:

For building telephone facilities, the size of entrance conduit shall not be less than _____ in diameter. a. 30
mm b. 50 mm c.
60 mm d. 75 mm
View Answer:
Answer: Option B

Solution:

In telephony, tone dialing takes _____ time than pulse dialing. a.
Less
b. More
c. About the same
d. Can't be determined
View Answer:
Answer: Option A

Solution:

A telephone service wherein calls are rerouted into a preassigned station is called _____. a.
Camp-On
b. Call Forwarding
c. Call Barring
d. Abbreviated
Dialing View Answer:
Answer: Option B

Solution:

What type of control system crossbar switches are operating? a.
Manual
b. Progressive
c. Common d.
Automatic
View Answer:

Answer: Option C

Solution:

55. PABX stands for
Private All-purpose Broadcasting Exchange
Private Automatic Branch Exchange
Public Access Bidirectional Exchange
Public Address Broadcasting Exchange
View Answer:
Answer: Option B

Solution:

56. A trunk is
a. The base of a communication tower
b. A telephone line connecting two C.O.'s
c. A line connecting one telephone set to the PABX
d. The structure where antenna are attached View
Answer:
Answer: Option B

Solution:

The voice frequency channel pass band is: a.
0 to 4000 Hz
b. 300 to 3000 Hz
c. To carry only speech
d. All of the preceding
View Answer:
Answer: Option A

Solution:

What is used to transmit more than one conversation over a path? a.
Hybrid
b. Tandem
c. Multiplexing
d. All of the above
View Answer:
Answer: Option C

Solution:

59. The common channel interoffice signalling method
a. Uses the same channel for signalling as for the related conversation

b. Is used on local loops
c. Uses a separate channel for signalling only
d. Comes the signalling for one related conversation
View Answer:
Answer: Option C

Solution:

Telephone switching is accomplished by a.
Manual Switchboard
b. Step-by-step Switches
c. Crossbar switches
d. Any of the these
View Answer:
Answer: Option D

In a wireless communication, base station is connected to central hub called _____
a) PSTN b)
MSC c) CO
d) PBX View
Answer
Answer: b

PSTN stands for _____
Public switched telephone network
Personal switched telephone network
Personal switched telephone node
Public switched telephone node
View Answer
Answer: a

MSCs provide connectivity between PSTN and the base stations. a)
True
b) False View
Answer
Answer: a

Communication protocol, CAI stands for _____
Common air interchange
Control air interchange
Common air interface
Control air interchange
View Answer
Answer: a

At the base station, the air interface portion of mobile transmission is passed to MSC. a) True
b) False View
Answer
Answer: b

PSTN is _____ and wireless networks are _____
Highly dynamic, virtually static
Static, virtually static
Highly dynamic, virtually dynamic
Virtually static, highly dynamic
View Answer
Answer: d

In public switched telephone network, LATA stands for _____
a) Local access and transport area
b) Land area and transport area
c) Local access and telephone access
d) Local area and telephone access
View Answer
Answer: a

LATAs are connected by a company called _____
Land exchange carrier
Local exchange carrier
Local control exchange
Land area exchange
View Answer
Answer: b

A long distance telephone company that collects toll is called _____
a) LATA b)
LEC c)
PSTN d)
IXC View
Answer
Answer: d

Wireless networks are extremely hostile and random nature of radio channel. a) True
b) False View
Answer
Answer: a

The technique for separate but parallel signalling channel is called _____
a) Common channel signalling

Forward channel signalling
Reverse channel signalling
Separate channel signalling
View Answer
Answer: a

In North America, the cellular telephone signalling network uses _____
a) SS7 b)
IXC c) IS-41
d) PSTN
View
Answer
Answer: a

What is the concept for accommodating a large number of users in a limited radio spectrum? a)
Grade of service
b) Trunking
c) Multiplexing
d) Multitasking
View Answer
Answer: b

On termination of call, the occupied channel is not returned to the pool of available channels in trunking.
a) True b)
False View
Answer
Answer: b
Explanation: In a trunked radio system, each user is allocated a channel on a per call basis. Upon termination of the call, the previously occupied channel is immediately returned to the pool of available channels. It is a method for a system to provide network access to many clients by sharing a set of lines or frequencies instead of providing them individually.

In trunking system, when the channel is already in use, the call is blocked or queued.
True
False View
Answer
Answer: a

Who developed the fundamental of trunking theory? a)
Newton
b) Ohm c)
Erlang d)
Einstein View
Answer
Answer: c

What is the unit for the measure of traffic intensity? a)
Meters
b) Henry c)
Ohm d)
Erlang View
Answer
Answer: d

One Erlang represents _____
One call- hour per hour
One call-minute per hour
One call- hour per minute
Many calls- hour per hour
View Answer
Answer: a

What is the measure of the ability of user to access a trunked system during the busiest hour? a)
Trunking
b) Grade of Service
(GOS) c) Multiplexing
d) Sectoring
View Answer
Answer: a

GOS is typically given as a likelihood that a _____
Call is in progress
Channels are busy
Call is blocked
Channel are free
View Answer
Answer: c

The time requires to allocate a trunked radio channel to a requesting user is called _____
a) Dwell time
b) Holding time
c) Run time
d) Set up Time
View Answer
Answer: d

Average duration of a typical call is called _____
Holding time
Dwell time
Set up time
Run time

View Answer
Answer: a

The average number of call requests per unit time is also known as _____
a) Request rate
b) Load
c) Grade o Service
d) Traffic intensity
View Answer
Answer: a

Traffic intensity offered by each user is the product of _____
Set up time and holding time
Call request rate and holding time
Load and holding time
Call request rate and set up time
View Answer
Answer: b

AMPS cellular system is designed for a GOS of _____ blocking. a)
10%
b) 50 % c)
2% d) 1%
View
Answer
Answer: c

Blocked calls cleared formula is also known as _____ formula. a)
Erlang C
b) Erlang A
c) Erlang D
d) Erlang B
View Answer
Answer: d

Blocked calls delayed formula is also known as _____
Erlang A
Erlang B
Erlang C
Erlang D
View Answer
Answer: c

BE (E&TC) – Mobile Communication

Multiple Choice Questions (MCQ) Unit III -

Cellular Concept

The modulation technique used for mobile communication systems during world war II was a.
Amplitude modulation
b. Frequency
modulation c. ASK
d. FSK
ANSWER: Frequency modulation

——— introduced Frequency Modulation for mobile communication systems in 1935.
a. Edwin Armstrong
b. Albert Einstein
c. Galileo Galilei
d. David Bohm
ANSWER: Edwin Armstrong

The early FM push-to-talk telephone systems were used in a.
Simplex mode
b. Half duplex mode c. Full
duplex mode d. None of the
above ANSWER: Half
duplex mode

DECT stands for
a. Digital European Cellular Telex
b. Digitized Emergency Cellular Telephone
c. Digital European Cordless Telephone
d. Digital European Cellular Telephone
ANSWER: Digital European Cordless Telephone

World's first cellular system was developed by a.
Nippon Telephone and Telegraph (NTT)
b. Bellcore and Motorola
c. AT&T Bell Laboratories
d. Qualcomm
ANSWER: Nippon Telephone and Telegraph (NTT)

Paging systems were based on
a. Simplex systems
b. Half duplex systems
c. Full duplex systems

d. None of the above
ANSWER: Simplex systems

Paging systems could be used to a.
Send numeric messages
b. Send alphanumeric messages
c. Voice message
d. All of the above
ANSWER: All of the above

Garage door opener is a
Transmitter
Receiver
Transceiver
None of the above
ANSWER: Transmitter

Carrier frequency of a TV remote control is in the range a.
of Infra red
b. < 100 MHz c. < 1
GHz d. < 2 GHz
ANSWER: of Infra
red

Half duplex system for communication has
a. Communication in single direction
b. Communication in single direction at a time
c. Communication in both directions at the same time
d. None of the above
ANSWER: Communication in single direction at a time

11) MIN stands for
a. Mobile Identification Number
b. Mobile Internet
c. Mobility In Network
d. None of the above
ANSWER: Mobile Identification Number

The process of transferring a mobile station from one base station to another is a.
MSC
b. Roamer
c. Hand off
d. Forward channel
ANSWER: Hand off

PCN is

a. Wireless concept of making calls
b. For receiving calls
c. Irrespective of the location of the user
d. All of the above
ANSWER: All of the above

IMT-2000 is a digital mobile system that functions as a.
Pager
b. Cordless
c. Low earth orbit satellites
d. All of the above
ANSWER: All of the above

The 2G cellular network uses
TDMA/FDD
CDMA/FDD
Digital modulation formats
All of the above ANSWER:
All of the above

NADC is a 2G standard for a.
TDMA
b. CDMA
c. Both a & b
d. None of the above
ANSWER: TDMA

2G CDMA standard – cdma one supports up to a. 8
users
b. 64 users c. 32
users d. 116 users
ANSWER: 64 users

2G standards support
a. Limited internet browsing
b. Short Messaging Service
c. Both a & b
d. None of the above
ANSWER: Both a & b

The 2G GSM technology uses a carrier separation of a.
1.25 MHz
b. 200 KHz
c. 30 KHz
d. 300 KHz

ANSWER: 200 KHz

3G W-CDMA is also known as a.
UMTS
b. DECT
c. DCS-1800 d.
ETACS
ANSWER: UMTS

Commonly used mode for 3G networks is a.
TDMA
b. FDMA c.
TDD d. FDD
ANSWER:
FDD

The minimum spectrum allocation required for W-CDMA is a.
5MHz
b. 2MHz c.
500KHz d.
100KHz
ANSWER: 5MHz

CDMA2000 1xEV provides high speed data access with channel allocation of a. 5
MHz
b. 50 MHz c. 1.25
MHz d. 4 MHz
ANSWER: 1.25 MHz

In TD-SDMA, there is a frame of _____milliseconds and the frame is divided into _____
time slots.
a. 5, 7
b. 7, 5 c. 2, 5 d.
5, 2 ANSWER:
5, 7

The interference between the neighboring base stations is avoided by
a. Assigning different group of channels
b. Using transmitters with different power level
c. Using different antennas
d. All of the above
ANSWER: Assigning different group of channels

26) Radio capacity may be increased in cellular concept by

a. Increase in radio spectrum
b. Increasing the number of base stations & reusing the
channels c. Both a & b
d. None of the above

ANSWER: Increasing the number of base stations & reusing the channels

The shape of the cellular region for maximum radio coverage is a.
Circular
b. Square
c. Oval
d. Hexagon
ANSWER: Hexagon

Hexagon shape is used for radio coverage for a cell because
a. It uses the maximum area for coverage
b. Fewer number of cells are required
c. It approximates circular radiation pattern
d. All of the above
ANSWER: All of the above

Centre excited hexagonal cells use a.
Sectored directional antennas
b. Omni directional antennas
c. Yagi uda antennas
d. None of the above
ANSWER: Omni directional antennas

Spectrum Efficiency of a cellular network is a.
The traffic carried by whole network
b. The traffic carried per cell divided by the bandwidth of the system and the area of a cell
c. Expressed in Erlang /MHz /km2
d. Both b and c e. Both
a and c ANSWER: Both
b and c

The advantage of using frequency reuse is
a. Increased capacity
b. Limited spectrum is required
c. Same spectrum may be allocated to other network
d. All of the above
ANSWER: All of the above

The strategies acquired for channel assignment are a.
Fixed
b. Dynamic

Regular
Both a and b
Both b and c ANSWER:
Both a and b

In a fixed channel assignment strategy, if all the assigned channels are occupied, the call a.
Gets transferred to another cell
b. Gets blocked
c. Is kept on waiting d.
All of the above
ANSWER: Gets blocked

In a fixed channel assignment strategy
a. Each cell is assigned a predetermined set of frequencies
b. The call is served by unused channels of the cell
c. The call gets blocked if all the channels of the cell are occupied
d. All of the above
ANSWER: All of the above

In a dynamic channel assignment strategy, a.
Voice channels are not permanently assigned
b. The serving base station requests for a channel from MSC
c. MSC allocates the channel according to the predetermined algorithm
d. All of the above
ANSWER: All of the above

Advantage of using Dynamic channel assignment is
a. Blocking is reduced
b. Capacity of the system is increased
c. Both a & b
d. None of the above
ANSWER: Both a & b

Disadvantage of using Dynamic channel assignment is a.
More storage required
b. Calculations and analysis is
increased c. Both a & b
d. None of the above
ANSWER: Both a & b

In Dynamic channel assignment, any channel which is being used in one cell can be reassigned simultaneously to another cell in the system at a reasonable distance.
a. True b. False
ANSWER: True

39) In Handoff
a. Process of transferring the call to the new base
station b. Transfers the call
c. New channel allocation is done
d. All of the above
ANSWER: All of the above

Delay in handoffs is caused due to a.
Week signal conditions
b. High traffic conditions
c. Un availability of the channel
d. All of the above ANSWER:
All of the above

Inter system Handoffs are done
a. When mobile station moves in two cellular systems with different MSC
b. When mobile station moves between two cellular systems
c. When mobile station receives more power from other base station than the serving base station
d. All of the above
ANSWER: All of the above

When a fraction of assigned channel is reserved for handoffs, it is a.
Guard channel concept
b. Fixed channel assignment
c. Dynamic channel assignment d.
None of the above ANSWER:
Guard channel concept

While handoffs, the termination of call may be avoided by
a. Providing Guard channel
b. Queuing of handoffs
c. Both a & b
d. None of the above
ANSWER: Both a & b

Dwell time is the time for a. A
call within the cell
b. Hand off
c. Waiting for channel allocation
d. None of the above ANSWER:
A call within the cell

Dwell time depends upon a.
Interference
b. Distance between the subscriber and the base
station c. Propagation of call

d. All of the above
ANSWER: All of the above

46) In Mobile Assisted Handoff (MAHO), the handoff takes place when
a. The power received by the mobile station from other base station is more than the serving base station
b. The channel allocated is not available
c. The mobile station has no signal
d. All of the above
ANSWER: The power received by the mobile station from other base station is more than the serving base station

Mobile Assisted Handoff (MAHO) provides a.
Faster handoffs
b. Suitability for frequent handoffs
c. MSC need not monitor the signal strength
d. All of the above
ANSWER: All of the above

Trunking in a cellular network refers to
a. Termination of a call
b. Spectrum unavailability
c. Accommodating large number of users in limited spectrum
d. All of the above
ANSWER: Accommodating large number of users in limited spectrum

When all of the radio channels are in use in a trunking system a.
The user is blocked
b. The access to the system is denied
c. The queue may be provided
d. All of the above
ANSWER: All of the above

Umbrella cell approach
a. Uses large and small cells
b. Uses different antenna heights
c. Is used for high speed users with large coverage area and low speed users with small coverage area
d. All of the above
ANSWER: All of the above

51) Interference in cellular systems is caused by
a. Two base stations operating in same frequency band
b. Two calls in progress in nearby mobile stations
c. Leakage of energy signals by non cellular systems into cellular frequency band
d. All of the above

ANSWER: All of the above

Interference in frequency bands may lead to a.
Cross talk
b. Missed calls c. Blocked
calls d. All of the above
ANSWER: All of the above

Co-channel reuse ratio depends upon
a. Radius of the cell
b. Distance between the centers of the co channel cells
c. Frequency allocation of nearest cells d. Both a and
b
e. Both b and c
ANSWER: Both a and b

Increase in Co- channel reuse ratio indicates a.
Better transmission quality
b. Larger capacity
c. Low co-channel
interference d. Both a and c
e. Both a and b
ANSWER: Both a and c

Grade of service refers to
a. Accommodating large number of users in limited spectrum
b. Ability of a user to access trunked system during busy
hour c. Two calls in progress in nearby mobile stations d.
High speed users with large coverage area
ANSWER: Ability of a user to access trunked system during busy hour

Traffic intensity is expressed in a.
Erlangs /MHz /km2
b. Erlangs c. λ/ sec
d. dB/sec
ANSWER: Erlangs

The techniques used to improve the capacity of cellular systems are a.
Splitting
b. Sectoring
c. Coverage zone approach
d. All of the above
ANSWER: All of the above

Distributed antenna systems are used at a.
Transmitters of mobile systems
b. Transmitters of base stations c. Inputs
and outputs of repeaters d. Receivers of
mobile stations ANSWER: Inputs and
outputs of repeaters

Antenna down tilting refers to
a. Focusing radio energy towards ground
b. Decreasing the strength of antenna
c. Decreasing the S/N ratio at the antenna input
d. All of the above
ANSWER: Focusing radio energy towards ground

Diffraction, at high frequencies, depends upon 1.
Geometry of the object
2. Polarization of the incident wave
3. Amplitude of the incident wave
4. Frequency of the incident wave

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 1, 2 and 3 are correct

The rainbow pattern seen on a CD is an example of a.
Reflection
b. Refraction
c. Diffraction
d. None of the above
ANSWER: Diffraction

Fresnel Reflection Coefficient is a factor of
Polarization of the wave
Properties of the material at which reflection occurs
Angle of incidence of wave

a. 1 and 2 are correct
b. 1 and 3 are correct
c. All the three are correct
d. 2 and 3 are correct
ANSWER: All the three are correct

63) When a wave falls on a perfect conductor
a. Wave is partially reflected and partially transmitted

b. All incident energy is reflected back without loss of energy
c. Part of energy gets absorbed
d. Both a and c

ANSWER: All incident energy is reflected back without loss of energy

Brewster angle is the angle at which a. No
reflection occurs at the first medium b.
Reflection coefficient is zero
c. The wave gets refracted in the direction of
source d. Both a and b
e. Both a and c
ANSWER: Both a and b

Fading is caused due to
Multi path propagation
Obstacles
Frequency variations at the source
Variation in amplitude and phase at receiver

a. 1 and 2 are correct
b. 1, 2 and 4 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 1, 2 and 4 are correct

66) Coherence time refers to
a. Time required to attain a call with the busy base station
b. Time required for synchronization between the transmitter and the
receiver c. Minimum time for change in magnitude and phase of the channel
d. None of the above
ANSWER: Minimum time for change in magnitude and phase of the channel

Fading due to shadowing is a.
Fading due to large obstructions
b. Large coherence time of the channel as compared to the delay constraints
c. Small coherence time of the channel as compared to the delay constraints
d. Both a and b
e. Both a and c
ANSWER: Both a and b

Deep fade is
Strong destructive interference
Drop in signal to noise ratio
Temporary failure of message transfer

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: All are correct

69) Doppler spread refers to
a. Signal fading due to Doppler shift in the
channel b. Temporary failure of message transfer
c. Large coherence time of the channel as compared to the delay
constraints d. All of the above
ANSWER: Signal fading due to Doppler shift in the channel

70) Friis free space equation
Is an expression for noise power
Is a function of transmitting and receiving antenna gain
Depends upon the distance between transmitting and receiving antenna

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 2 and 3 are correct

71) The free space model of propagation refers to
Unobstructed line of sight between the transmitter and receiver
Satellite communication systems and Microwave line of sight radio links
Propagation along the ground surface

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: 1 and 2 are correct

72) According to Friis free space equation
Received power falls with square of the distance between the transmitter and receiver
Increases with square of the distance between the transmitter and receiver
Received power increases with gains of transmitting and receiving antennas

a. 1 and 2 are correct
b. 1 and 3 are correct
c. All the three are correct
d. 2 and 3 are correct
ANSWER: All the three are correct

73) EIRP is
Effective Isotropic Radiated Power
Maximum radiated power available by the transmitter
A factor of power and gain of transmitter

a. 1 and 2 are correct
b. 1 and 3 are correct
c. All the three are correct
d. 2 and 3 are correct
ANSWER: All the three are correct

Spread spectrum modulation involves 1.
PN sequence for modulation
2. Large bandwidth
3. Multiple users

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct

PN sequence at the decoder acts as a locally generated carrier at the receiver and decodes the signal using
a. Correlator
b. Adder
c. Frequency divider
d. PLL ANSWER:
Correlator

In spread spectrum technique, the multiple users are assigned with
a. Same spectrum and same PN code
b. Same spectrum and different PN code
c. Different spectrum and different PN code d.
Different spectrum and same PN code ANSWER:
Same spectrum and different PN code

Advantage of using Spread Spectrum modulation is/are 1.
Interference rejection capability
2. Frequency planning is not required
3. Resistance to multipath fading
4. ISI is lesser

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct

d. All the four are correct
ANSWER: All the four are correct

Direct sequence spread spectrum demodulation uses a.
DPSK
b. FSK c. ASK d.
QPSK ANSWER:
DPSK

Fast hopping is
a. More than one frequency hop during each symbol
b. Hopping rate greater than or equal to information symbol rate
c. One or more symbols transmitted between frequency hops
d. Both a and b
e. Both b and c
ANSWER: Both a and b

80) Slow frequency hopping refers to
a. One or more symbols transmitted in time interval between frequency hops
b. More than one frequency hop during each symbol
c. Hopping rate greater than or equal to information symbol rate
d. Both a and c are correct
ANSWER: One or more symbols transmitted in time interval between frequency hops

Probability of outage refers to a.
Noise developed at the receiver
b. Number of bit errors during transmission
c. Signal to noise ratio
d. All of the above
ANSWER: Number of bit errors during transmission

The digital modulation technique used in frequency selective channels is a.
FSK
b. ASK c. BPSK
d. QPSK
ANSWER:
BPSK

Working of Adaptive Equalizers include
Training
Tracking
Modulation
Both a and b
All a, b and c are correct
ANSWER: Both a and b

84) The time span for which the equalizer converges depends upon

Equalizer algorithm
Equalizer structure
Rate of change of multipath radio channel
Amplitude of signal

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All the four are correct
ANSWER: 1, 2 and 3 are correct

85) The Linear Equalizer may be implemented as

a. FIR filter
b. Lattice filter
c. Low pass filter
d. Both a and b
e. Both a and c
ANSWER: Both a and b

86) Linear equalizer is also known as

a. Transversal filter
b. Lattice filter
c. Low pass filter
d. None of the above
ANSWER: Transversal filter

87) The methods used for non linear equalization are

a. Decision Feedback Equalization
b. Maximum Likelihood Symbol Detection
c. Maximum Likelihood Sequence Estimation

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. None of the above
ANSWER: 1, 2 and 3 are correct

The performance of algorithms for Adaptive Equalization are given by 1.

Rate of convergence

Computational complexity
Numerical properties
Frequency change

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 1, 2 and 3 are correct

Computational complexity of an algorithm refers to the a.
Number of operations for one iteration of algorithm
b. Inaccuracies in the mathematical analysis
c. Noise produced during one complete iteration of
algorithm d. All of the above
ANSWER: Number of operations for one iteration of algorithm

The algorithms acquired for adaptive equalization are
Zero forcing algorithm
Least mean squares algorithm
Recursive least squares algorithm

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. None of the above
ANSWER: 1, 2 and 3 are correct

Fractionally spaced equalizer acts as a.
Matched filter
b. Equalizer
c. Demodulator
d. Both a and b
e. All a, b and c are correct
ANSWER: Both a and b

Diversity employs the decision making at a.
Transmitter
b. Receiver
c. Transmitter and receiver
d. Communication channel
ANSWER: Receiver

The diversity schemes are based on
Time diversity
Frequency diversity

Space diversity
Polarization diversity

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All the four are correct
ANSWER: All the four are correct

94) In time diversity

a. Multiple versions of signals are transmitted at different time instants b. The signal is transmitted using multiple channels
c. Signal is transmitted with different polarization
d. All of the above
ANSWER: Multiple versions of signals are transmitted at different time instants

RAKE receiver is 1.
Several sub receivers
2. Several correlators
3. Fingers
4. Equalization based

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All the four are correct
ANSWER: 1, 2 and 3 are correct

96) The RAKE receiver involves the steps
a. Correlator, estimation of transmitted signal, demodulation, bit decision b. Estimation of transmitted signal, correlator, demodulation, bit decision c. Estimation of transmitted signal, demodulation, correlator, bit decision d. Estimation of transmitted signal, demodulation, bit decision, correlator ANSWER: Correlator, estimation of transmitted signal, demodulation, bit decision

Search window of a RAKE receiver is a.
Frequency band of the channel
b. Range of the time delays c. Range of noise
d. All of the above
ANSWER: Range of the time delays

Speech Coders are categorized on the basis of a.
Signal compression techniques
b. Frequency of signal

c. Bandwidth of the signal
d. All of the above
ANSWER: Signal compression techniques

Waveform coders and Vocoders are the types of a.
Speech coders
b. Modulation technique
c. Frequency translation methods
d. Channel allocation for transmission
ANSWER: Speech coders

PCM, DPCM, DM, ADPCM are the types of a.
Vocoders
b. Waveform coders
c. Channel allocation for
transmission d. All of the above
ANSWER: Waveform coders

Speech coding technique that is independent of the source is a.
Vocoders
b. Waveform coders
c. Both a & b
d. None of the above
ANSWER: Waveform coders

Advantage of using waveform coders is
Independent of the signal source
Less complexity
Suitable for noisy environments

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct

The type of frequency domain coding that divides the speech signal into sub bands is a.
Waveform coding
b. Vocoders
c. Block transform coding d.
Sub-band coding ANSWER:
Sub-band coding

The speech coding technique that is dependent on the prior knowledge of the signal is a.
Waveform coders
b. Vocoders

c. Sub band coding
d. Block transform coding
ANSWER: Vocoders

The steps involved in Channel vocoders for speech transmission are a. Envelope detection, sampling, encoding, multiplexing
b. Sampling, Envelope detection, encoding, multiplexing c. Envelope detection, encoding, sampling, multiplexing d. Sampling, Envelope detection, multiplexing, encoding
ANSWER: Envelope detection, sampling, encoding, multiplexing

Vocal tract cepstral coefficients and excitation coefficients are separated by a. Samplers
b. Linear filters
c. Encoders
d. Multiplexers
ANSWER: Linear filters

In voice excited vocoders, PCM transmission helps in transmission of
a. High frequency bands of speech
b. Low frequency bands of speech
c. Multiplexed signals
d. Modulated signals
ANSWER: Low frequency bands of speech

108) Linear predictive coders are based on the principle that
Current signal sample is obtained from linear combination of past samples
Current signal sample is independent of past samples
These are time domain vocoders
They are among low bit rate vocoders

a. 1, 3 and 4 are correct
b. 2, 3 and 4 are correct
c. 1 and 4 are correct
d. All the four are correct
ANSWER: 1, 3 and 4 are correct

Multi pulse excited LPC includes 1. Multiple pulses per period
2. Minimization of weighted mean square error
3. Better speech quality
4. Pitch detection is not required

a. 1 and 4 are correct
b. 1 and 3 are correct
c. 2 and 4 are correct

d. All four are correct
ANSWER: All four are correct

110) In residual excited LPC,
a. The residue of subtraction of generated and original signal is quantized at the transmitter
b. Pitch detection is not required
c. Multiple pulses per period
d. Coder and decoders have predetermined set of codes
ANSWER: The residue of subtraction of generated and original signal is quantized at the transmitter

The speech sequence in GSM Codec consists of a. Pre emphasis, segmentation, windowing, filtering b. Windowing, Pre emphasis, segmentation, filtering c. Pre emphasis, windowing, segmentation, filtering d. Pre emphasis, segmentation, filtering, windowing ANSWER: Pre emphasis, segmentation, windowing, filtering

The windowing technique used for speech coding in GSM Codec is a. Blackman window
b. Welch window c. Cosine window d. Hamming window
ANSWER: Hamming window

The received signal at the GSM speech decoder is passed through a. STP filter
b. LTP filter c. Quantizer d. PLL
ANSWER: LTP filter

In GSM Codec, the bits encoded for forward error correction are
a. Ia bits
b. Ib bits
c. II bits
d. Both a and b
e. Both a and c
ANSWER: Both a and b

115) The speech coders are selected on the basis of

Robustness to transmission errors
Cell size
Type of modulation technique used
Distance between the transmitter and receiver

a. 1 and 4 are correct
b. 1, 2 and 3 are correct
c. 2 and 4 are correct
d. All four are correct
ANSWER: 1, 2 and 3 are correct

FDMA is the division of a.
Time
b. Phase
c. Spectrum d.
Amplitude
ANSWER: Spectrum

Guard band is
a. The small unused bandwidth between the frequency channels to avoid interference
b. The bandwidth allotted to the signal
c. The channel spectrum
d. The spectrum acquired by the noise between the signal
ANSWER: The small unused bandwidth between the frequency channels to avoid interference

Cable television is an example of a.
TDMA
b. FDMA c.
CDMA d. SDMA
ANSWER: FDMA

In FDMA,

Each user is assigned unique frequency slots
Demand assignment is possible
Fixed assignment is possible
It is vulnerable to timing problems
a. 1 and 2 are correct
b. 2 and 4 are correct
c. 1, 2 and 3 are correct
d. All four are correct
ANSWER: 1, 2 and 3 are correct

FDMA demand assignment uses 1.
Single channel per carrier
2. Multi channel per carrier
3. Single transmission in one time slot
4. Multi transmission in one time slot

a. 1 and 2 are correct
b. 2, 3 and 4 are correct
c. 1, 2 and 3 are correct
d. All four are correct
ANSWER: 1 and 2 are correct

The advantages of FDMA over TDMA includes 1.
Division is simpler
2. Propagation delays are eliminated
3. Cheaper filters with less complicated logic functions
4. Linearity

a. 1, 2 and 3 are correct
b. 1 and 2 are correct
c. 1 and 4 are correct
d. All four are correct
ANSWER: 1 and 2 are correct

TDMA is a multiple access technique that has a.
Different users in different time slots
b. Each user is assigned unique frequency slots c.
Each user is assigned a unique code sequence
d. Each signal is modulated with frequency modulation technique
ANSWER: Different users in different time slots

In TDMA, the user occupies the whole bandwidth during transmission a.
True
b. False
ANSWER: True

TDMA allows the user to have
a. Use of same frequency channel for same time slot
b. Use of same frequency channel for different time slot
c. Use of same time slot for different frequency channel
d. Use of different time slot for different frequency channels
ANSWER: Use of same frequency channel for different time slot

GSM is an example of a. TDMA
cellular systems b. FDMA cellular
systems c. CDMA cellular systems
d. SDMA cellular systems
ANSWER: TDMA cellular
systems

TDMA is employed with a TDMA frame that has preamble. The preamble contains
Address of base station and subscribers

Synchronization information
Frequency allotted
Coded sequence

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 4 are correct
d. All four are correct
ANSWER: 1 and 2 are correct

127) CDMA is
Spread spectrum technology
Using same communication medium
Every user stays at a certain narrowband channel at a specific time period
Each user has unique PN code

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All four are correct
ANSWER: 1, 2 and 4 are correct

128) Global Positioning System uses

CDMA
TDMA
SDMA
FDMA ANSWER:
CDMA

CDMA is advantageous over other Spread Spectrum techniques for 1.
The privacy due to unique codes
2. It rejects narrow band interference
3. Resistance to multi path fading
4. Its ability to frequency reuse

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct

The wide band usage in CDMA helps in 1.
Increased immunity to interference
2. Increased immunity to jamming
3. Multiple user access

4. Different spectrum allocation in different time slots

a. 1, 2 and 3 are correct
b. 2, 3 and 4 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: 1, 2 and 3 are correct

The advantages of using a CDMA technique over other spread spectrum techniques are 1. Increased capacity
2. Easier handoff
3. Better measure of security
4. Multiple users occupy different spectrum at a time

a. 1, 2 and 3 are correct
b. 2, 3 and 4 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: 1, 2 and 3 are correct

132) FHMA is
Spread spectrum technology
Using same communication medium
Every user has assigned unique frequency slot
Each user has unique PN code

a. 1 and 2 are correct
b. 1, 2 and 4 are correct
c. 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct

133) OFDM is a technique of

Encoding digital data
Multiple carrier frequencies
Wide band digital communication
4G mobile communication

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct

134) Advantages of using OFDM include

Avoids complex equalizers
Low symbol rate and guard interval
Avoids ISI
Multiple users at same frequency

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct

The troubles that OFDM faces over other spread spectrum techniques are 1. Sensitivity to Doppler shift
2. Frequency synchronization problems
3. Time synchronization problems
4. Low efficiency due to guard intervals

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: 1, 2 and 4 are correct

The guard interval is provided in OFDM a. To eliminate the need of pulse shaping filter b. To eliminate ISI
c. High symbol rate
d. Both a and b
e. Both b and c
ANSWER: Both a and b

Packet radio refers to
a. Multiple users on single channel
b. Single user on multiple channels as per demand
c. Multiple users on multiple channels at different time slots
d. Multiple users with coding techniques ANSWER: Multiple users on single channel

Disadvantages of packet radio are a. Induced delays
b. Low spectral efficiency
c. Large spectrum required d. Both a and b
e. Both b and c
ANSWER: Both a and b

Pure ALOHA is a a. Random
access protocol b. Scheduled access
protocol c. Hybrid access protocol
d. Demand access protocol
ANSWER: Random access
protocol

The increase in number of users in PURE ALOHA causes a.
Increase in delay
b. Increase in probability of
collision c. Increase in spectrum
d. Both a and b e. Both
a and c ANSWER: Both
a and b

SDMA technique employs
a. Smart antenna technology
b. Use of spatial locations of mobile units within the
cell c. More battery consumption d. Both a and b are
correct
e. Both b and c are correct
ANSWER: Both a and b are correct

The advantage of using SDMA over other spread spectrum technique is a.
Mobile station battery consumption is low
b. Reduced spectral efficiency
c. Increased spectral efficiency
d. Both a and b are correct
e. Both a and c are correct
ANSWER: Both a and c are correct

The increased capacity of SDMA is due to
a. Focused signal transmitted into narrow transmission beams
b. Smart antennas pointing towards mobile stations c. Use of
different frequencies at same time slot
d. Both a and b are correct
e. Both a and c are correct
ANSWER: Both a and b are correct

144) Coherence time is
a. Directly proportional to Doppler spread
b. Indirectly proportional to Doppler spread
c. Directly proportional to square of Doppler spread
d. Directly proportional to twice of Doppler spread
ANSWER: Directly proportional to Doppler spread

Types of small scale fading, based on Doppler spread are a.
Fast fading
b. Frequency non selective
fading c. Flat fading
d. Frequency selective fading
ANSWER: Fast fading

Flat fading or frequency nonselective fading is a type of

a. Multipath delay spread small scale fading
b. Doppler spread small scale fading
c. Both a & b
d. None of the above
ANSWER: Multipath delay spread small scale fading

147) In Frequency Selective Fading, the
a. Coherence Bandwidth of the channel is less than bandwidth of transmitted channel
b. Coherence Bandwidth of the channel is more than bandwidth of transmitted
channel c. Coherence Bandwidth of the channel is equal to bandwidth of transmitted
channel d. None of the above
ANSWER: Coherence Bandwidth of the channel is less than bandwidth of transmitted channel

If coherence time of the channel is smaller than the symbol period of the transmitted
signal, it is
a. Fast fading
b. Slow fading
c. Frequency selective fading
d. Frequency non selective
fading ANSWER: Fast fading

The power delay profile helps in determining
a. Excess delay
b. rms delay spread
c. Excess delay spread
d. All of the above
ANSWER: All of the above

150) Coherence bandwidth is
a. Channel that passes all spectral components with equal
gain b. The bandwidth of modulated signal
c. Channel that passes all spectral components with linear phase
d. Both a and c
e. Both a and b
ANSWER: Both a and c

151) Small scale multipath propagation is caused due to waves with

Different propagation delays
Different amplitudes
Different phase

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct

The effects of small scale multipath propagation are 1.
Changes in signal strength
2. Random frequency modulation
3. Time dispersion

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct

153) Impulse response of a multipath channel is determined by the fact that

a. Mobile radio channel may be modeled as linear filter
b. Impulse response is time varying c. Both a & b

d. None of the above
ANSWER: Both a & b

The received signal from a multipath channel is expressed as a.
Convolution of transmitted signal and impulse response
b. Addition of transmitted signal and impulse response c.
Subtraction of transmitted signal and impulse response
d. All of the above
e. None of the above
ANSWER: Convolution of transmitted signal and impulse response

Direct RF pulse system helps in calculating
a. Impulse response in frequency domain
b. Impulse response in phase domain
c. Power delay of the channel
d. All of the above
ANSWER: Power delay of the channel

The techniques used for small scale multipath measurements are 1.
Direct RF pulse system

Spread spectrum sliding correlator channel sounding
Frequency domain channel sounding

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct

BE (E&TC) – Mobile Communication

Multiple Choice Questions (MCQ) Unit No.

4 : GSM Fundamentals

What are the three main parts of a GSM Architecture or Structure?
A) Mobile Station
B) BSS - Base Station Subsystem
C) NSS - Network and Switching Subsystem
D) All the above
Answer: D

What are the main parts of a Mobile Station in a GSM Network?
A) MT - Mobile Terminal
B) SIM - Subscriber Identity
Module C) Both A and B
D) None
Answer: C

What are the main parts of a BSS (Base Station Subsystem) in a GSM network?
A) BTS - Base Transceiver Station
B) BSC - Base Station
Controller C) A and B
D) None
Answer: C

What are the main parts of a NSS (Network and Switching Subsystem) of a GSM Architecture?
A) MSC - Mobile Switching
Center B) HLR & AuC
C) VLR, EIR D)
All the above
Answer: D

What are the main parts of an MSC (Mobile Switching Center) system in a GSM structure?
A) MGW - Media Gateway
B) MSC Server
C) Both A and
B D) None
Answer: C

A GPRS Core network is part of System in a GSM Network Structure?
Mobile Station
BSS

MSS
NSS
Answer: D

A BTS is also called _____ by general public?
A) Mobile tower
B) Exchange
C) Charging
Point D) None
Answer: A

Each Mobile Terminal is identified by a unique _____ number?
A) IMEI
B) SIM C)
IMSI D)
None
Answer: A

IMEI stands for?
Internal Mobile Equipment Identity
International Mobile Equipment Identity
Intra Mobile Enable Identity
None
Answer: B

Each SIM is identified by a unique _____ number?
A) IMSI
B) IMEI
C) MSDN
D) None
Answer: A

IMSI stands for?
Internal Mobile Subscriber Identity
International Mobile Subscriber Identity
Investigating Mobile Subscriber Identity
None
Answer: B

Your mobile number is actually called _____ number.
A) IMSI
B) SIM
C) MSISDN
D) None
Answer: C

IMSI number of a SIM is also called?
A) MSISDN
B) IMEI C)
ICCID D)
None
Answer: C

14 What controller a group of BTS or Cell Towers?
BSC
MSC
HLR
VLR
Answer: A

How many digits of PIN (Personal Identification Number) is allowed to protect a SIM card? A)
4
B) 8 C) 10
D) None
Answer:
A

What is PUK code of a SIM?
PIN Unlock Key
4 digit code
It is like a password to enter after inserting SIM in a mobile for the first time. It prevents misuse.
All
Answer: D

The only element that personalises a Mobile Station is _____? A)
Back cover
B) SIM
C) Screen guard
D) None
Answer: B

What is the maximum number of Transceivers a BTS can handle is ? A)
8
B) 12 C)
16 D) 22
Answer: C

What are the functions of a BSC?
Handovers, exchange functions
Frequency hopping

Control of radio frequency power level of BTS
All
Answer: D

20. What is the main function of NSS?
Establishing communication between mobile and landline numbers.
Providing eligible services to the subscriber
Providing parameters for Authentication and Encryption
All
Answer: D

21. Which of the following is the world's first cellular system to specify digital modulation and network level architecture?
GSM
AMPS
CDMA
IS-54 View
Answer
Answer: a

Previously in 1980s, GSM stands for _____
a) Global system for mobile
b) Groupe special mobile c)
Global special mobile d)
Groupe system mobile
View Answer
Answer: b

Who sets the standards of GSM?
ITU
AT&T
ETSI
USDC View
Answer
Answer: c

Which of the following does not come under the teleservices of GSM? a)
Standard mobile telephony
b) Mobile originated traffic
c) Base originated traffic
d) Packet switched traffic
View Answer
Answer: d

Which of the following comes under supplementary ISDN services? a)
Emergency calling

Packet switched protocols
Call diversion
Standard mobile telephony
View Answer
Answer: c

26. Which of the following memory device stores information such as subscriber's identification number in GSM?
Register
Flip flop
SIM
SMS View
Answer
Answer: c

Which of the following feature makes impossible to eavesdrop on GSM radio transmission? a) SIM
b) On the air privacy
c) SMS
d) Packet switched traffic
View Answer Answer: b

.

Which of the following does not come under subsystem of GSM architecture?
BSS
NSS
OSS
Channel
View Answer
Answer: d

Which of the following subsystem provides radio transmission between mobile station and MSC?
a) BSS b)
NSS c) OSS
d) BSC View
Answer
Answer: a

_____ manages the switching function in GSM.
BSS
NSS
OSS

MSC View
Answer
Answer: b

Cellular concept replaces many low power transmitters to a single high power transmitter. a)
True
b) False View
Answer
Answer: b

Why neighbouring stations are assigned different group of channels in cellular system?
To minimize interference
To minimize area
To maximize throughput
To maximize capacity of each cell
View Answer
Answer: a

What is a cell in cellular system? a)
A group of cells
b) A group of subscribers
c) A small geographical area
d) A large group of mobile systems
View Answer
Answer: a

What is frequency reuse?
Process of selecting and allocating channels
Process of selection of mobile users
Process of selecting frequency of mobile equipment
Process of selection of number of cells
View Answer
Answer: a

Which of the following is a universally adopted shape of cell? a)
Square
b) Circle c)
Triangle d)
Hexagon
View Answer
Answer: d

Actual radio coverage of a cell is called _____
Fingerprint
Footprint
Imprint

Matrix View
Answer
Answer: b

Why the shape of cell is not circle? a)
Omni directionality
b) Small area
c) Overlapping regions or gaps are
left d) Complex design
View Answer
Answer: c

What is the main reason to adopt hexagon shape in comparison to square and triangle? a)
Largest area
b) Simple design
c) Small area
d) Single directional
View Answer
Answer: a

Which type of antenna is used for center excited cells?
Dipole antenna
Grid antenna
Sectored antenna
Omnidirectional antenna
View Answer
Answer: d

Which type of antenna is used for edge excited cells? a)
Omnidirectional antenna
b) Grid antenna
c) Sectored directional antenna
d) Dipole antenna
View Answer
Answer: c

For a cellular system, if there are N cells and each cell is allocated k channel. What is the total number of available radio channels, S?
a) S=k*N b)
S=k/N c)
S=N/k d)
S=kN View
Answer
Answer: a

What is a cluster in a cellular system?

Group of frequencies
Group of cells
Group of subscribers
Group of mobile systems
View Answer
Answer: b

What is a frequency reuse factor for N number of cells in a system? a) N
b) N2 c) 2*N
d) 1/N View Answer
Answer: d

Capacity of a cellular system is directly proportional to _____
a) Number of cells
b) Number of times a cluster is replicated
c) Number of Base stations
d) Number of users
View Answer
Answer: b

A spectrum of 30 MHz is allocated to a cellular system which uses two 25 KHz simplex channels to provide full duplex voice channels. What is the number of channels available per cell for 4 cell reuse factor?
a) 150 channels
b) 600 channels
c) 50 channels
d) 85 channels
View Answer
Answer: a

Which of the following is not an objective for channel assignment strategies?
Efficient utilization of spectrum
Increase of capacity
Minimize the interference
Maximize the interference
View Answer
Answer: d

The choice of channel assignment strategy does not impact the performance of the system. a) True
b) False

View Answer
Answer: b

In fixed channel assignment strategy, each cell is allocated a predetermined set of _____
a) Voice channels
b) Control channels
c) Frequency
d) base stations
View Answer

Answer: a
Explanation: In a foxed channel strategy, each cell is allocated a predetermined set of voice channels. Any call attempt within the cell can only be served by the unused channels in that particular cell.

What happen to a call in fixed channel strategy, if all the channels in a cell are occupied? a) Queued
b) Cross talk
c) Blocked d)
Delayed
View Answer

Answer: c
Explanation: As any call attempt within a cell can be served by unused channels in fixed channel strategy. If all the channels in that cell are occupied, the call is blocked and subscriber does not receive any service.

What is a borrowing strategy in fixed channel assignments? a)
Borrowing channels from neighbouring cell
b) Borrowing channels from neighbouring
cluster c) Borrowing channels from same cell
d) Borrowing channels from other base station in same
cell View Answer

Answer: a
Explanation: In borrowing strategy, a cell is allowed to borrow channels from a neighbouring cell if all of its own channels are already occupied. The MSC supervises such borrowing procedure and ensures that the borrowing of channel does not interfere with any call in progress.

In dynamic channel assignment strategy, voice channels are allocated to different cells permanently.
a) True b)
False View
Answer

Answer: b

Explanation: In a dynamic channel strategy, voice channels are not allocated to different cells permanently. Instead, serving base station requests a channel from MSC each time a cell request is made.

In dynamic channel assignment strategy, base station requests channel from _____
a) MSC
b) Neighbouring cell c)
Neighbouring cluster
d) Neighbouring base station
View Answer

Answer: a
Explanation: Each time a call request is made, the serving base station requests a channel from the MSC. The switch then allocates a channel to the requested cell following an algorithm that takes into account the likelihood of future blocking within the cell.

Dynamic channel assignment reduces the likelihood of blocking in comparison to fixed channel assignment.
a) True b)
False View
Answer

Answer: a
Explanation: Dynamic channel assignment reduces the likelihood of blocking. Accordingly, the MSC only allocates a given frequency if that frequency is not presently in use in the cell or any other cell which falls within the minimum restricted distance of frequency reuse.

53. RSSI stands for _____
Radio System Signal Indicator
Restricted Signal Strength Indicator
Radio Signal Strength Indication
Restricted System Software Indicator
View Answer

Answer: a
Explanation: Received signal strength indicator (RSSI) is a measurement of the power present in a received radio signal. RSSI is usually invisible to a user of a receiving device.

What is the drawback of dynamic channel assignment? a)
Decrease channel utilization
b) Increase probability of blocked call
c) Cross talk
d) Increase storage and computational load on system
View Answer

Answer: d

Explanation: Dynamic channel assignment requires the MSC to collect real time data on channel occupancy, traffic distribution and RSSI of all channels on continuous basis. This increases the storage and computational load on the system but provides the advantage of increased channel utilization and decreased probability of blocked call

55. What is the condition for handoff?
A mobile moves into a different cell while in conversation
A mobile remains in the same cell while in conversation
A mobile moves to different cell when idle
A mobile remains in the same cell and is idle
View Answer
Answer: a

Handoff does not require voice and control channel to be allocated to channels associated with the new base station.
a) True b)
False View
Answer
Answer: b

The time over which a call can be maintained within a cell without handoff is called _____
a) Run time
b) Peak time
c) Dwell time
d) Cell time
View Answer
Answer: c

Dwell time does not depend on which of the following factor?
Propagation
Interference
Distance between subscriber and base station
Mobile station
View Answer
Answer: d

Which of the following is associated with the handoff in first generation analog cellular systems?
a) Locator receiver
b) MAHO
c) Cell dragging
d) Breathing cell
View Answer
Answer: a

MAHO stands for _____
a) MSC assisted handoff b)
Mobile assisted handoff c)
Machine assisted handoff
d) Man assisted handoff
View Answer
Answer: b

A handoff is initiated when the power received from the base station of a neighbouring cell falls behind the power received from the current base station by certain level.
a) True b)
False View
Answer
Answer: b

What is the condition for intersystem interference?
Mobile moves from one cell to another cell
Mobile remains in the same cell
Mobile moves from one cellular system to another cellular system
Mobile remains in the same cluster
View Answer
Answer: c

What is the disadvantage of guard channel? a)
Efficient utilization of spectrum
b) Cross talk
c) Near far effect
d) Reduce total carried traffic
View Answer
Answer: d

Which of the following priority handoff method decrease the probability of forced termination of a call due to lack of available channels?
a) Queuing
b) Guard
channel c) Cell
dragging d) Near
far effect View
Answer Answer:

Umbrella cell approach is possible by using _____
Antenna of same heights
Antenna of different heights
Different voice channels
Different control channels
View Answer

Answer: b

Cell dragging is a problem occur due to _____
a) Pedestrian users
b) Stationary users
c) High speed mobile systems
d) Base stations having same
frequency View Answer
Answer: a

What was the typical handoff time in first generation analog cellular systems? a)
1 second
b) 10 seconds
c) 1 minute
d) 10 milliseconds
View Answer
Answer: b

How much time it takes for handoff in digital cellular systems like GSM? a)
1 second
b) 10 seconds
c) 1 minute
d) 10 milliseconds
View Answer
Answer: a

Soft handoff is also known as _____
a) MAHO b)
Hand over
c) Break before make
d) Make before break
View Answer
Answer: d

Which of the following is not a source of interference? a)
Base station in a different cluster
b) Another mobile in same cell
c) A call in progress in neighbouring cell
d) Any BS operating on same frequency
View Answer
Answer: a

Interference on voice channels causes _____
Blocked calls
Cross talk
Queuing

Missed calls
View Answer
Answer: b

Interference in control channel leads to _____
a) Cross talk
b) Queuing
c) Blocked calls
d) Voice traffic
View Answer
Answer: c

Interference is more severe in rural areas.
True
False View
Answer
Answer: b

73. What are co-channel cells?
Cells having different base stations
Cells using different frequency
Cells using adjacent frequency
Cells using same frequency
View Answer
Answer: d

Co-channel interference is a function of _____
a) Radius of cell
b) Transmitted power
c) Received power
d) Frequency of mobile user
View Answer
Answer: a

Co-channel reuse ratio is define by _____
Q=D*R
Q=D/R
Q=D^R
Q=1/R View
Answer
Answer: b

Co-channel ratio in terms of cluster size is defined as _____
a) (3N)−−−−√
b) N
c) 3N

d) √N
View Answer
Answer: a

What is the cluster size for CDMA? a)
N=10
b) N=100 c)
N=1 d) N=50
View
Answer
Answer: c

What is breathing cell effect?
Fixed coverage region
Dynamic and time varying coverage region
Large coverage region
Very small coverage region
View Answer
Answer: b

Adjacent channel interference occurs due to _____
a) Power transmitted by Base
station b) MSCs
c) Same frequency of mobile users
d) Imperfect receiver filters View
Answer
Answer: d

Which of the following problem occur due to adjacent channel interference? a)
Blocked calls
b) Cross talk
c) Near-far effect
d) Missed calls
View Answer
Answer: c

In near-far effect, a nearby transmitter captures the _____
Receiver of the subscriber
Transmitter of the subscriber
Nearby MSC
Neighbouring base station
View Answer
Answer: a

82. Adjacent channel interference can be minimized through _____

Changing frequency of base stations
Careful filtering and channel assignments
Increasing number of base stations
Increasing number of control channels
View Answer
Answer: b

In dynamic channel assignment, any channel which is being used in one cell can be reassigned simultaneously to another cell in the system at a reasonable distance.
a) True b)
False View
Answer
Answer: a

_____ is a first-generation cellular phone system.
AMPS
D-AMPS
GSM
none of the above
Ans: A

_____ is a second-generation cellular phone system.
AMPS
D-AMPS
GSM
none of the above
Ans: B

_____ is a digital version of AMPS.
GSM
D-AMPS
IS-95
none of the above
Ans: B

_____ is a second-generation cellular phone system used in Europe.
GSM
D-AMPS
IS-95
none of the above
Ans: A

_____ is a second-generation cellular phone system based on CDMA and DSSS.
GSM
D-AMPS
IS-95

none of the above
Ans: C

The _____ cellular phone system will provide universal personal communication.
first-generation
second-generation
third-generation
none of the above
Ans: C

In a _____ handoff, a mobile station only communicates with one base station.
hard
soft
medium
none of the above
Ans: A

In a _____ handoff, a mobile station can communicate with two base stations at the same time.
hard
soft
medium
none of the above
Ans: B

_____ is an analog cellular phone system using FDMA.
AMPS
D-AMPS
GSM
none of the above
Ans: A

AMPS operates in the ISM _____ band.
800-MHz
900-MHz
1800-MHz
none of the above
Ans: A

In AMPS, each band is divided into _____ channels.
800
900
1000
none of the above
Ans: D

AMPS has a frequency reuse factor of _____.
1
3
5
7
Ans: D

AMPS uses _____ to divide each 25-MHz band into channels.
FDMA
TDMA
CDMA
none of the above
Ans: A

D-AMPS uses _____ to divide each 25-MHz band into channels.
FDMA
TDMA
CDMA
both (a) and (b)
Ans: D

GSM allows a reuse factor of _____.
1
3
5
7
Ans: B

GSM is a digital cellular phone system using _____.
FDMA
TDMA
CDMA
both (a) and (b)
Ans: D

IS-95 is based on _____.
FDMA
CDMA
DSSS
all of the above
Ans: D

IS-95 uses the ISM _____band.
800-MHz
900-MHz

1900-MHz
either (a) or (c)
Ans: D

IS-95 uses the _____ satellite system for synchronization.
GPS
Teledesic
Iridium
none of the above
Ans: A

In an IS-95 system, the frequency-reuse factor is normally _____.
1
3
5
7
Ans: A

In the third generation of cellular phones, _____ uses W-CDMA.
IMT-DS
IMT-MC
IMT-TC
IMT-SC
Ans: A

In the third generation of cellular phones, _____ uses CDMA2000.
IMT-DS
IMT-MC
IMT-TC
IMT-SC
Ans: B

In the third generation of cellular phones, _____ uses a combination of W-CDMA and TDMA.
IMT-DS
IMT-MC
IMT-TC
IMT-SC
Ans: C

In the third generation of cellular phones, _____ uses TDMA.
IMT-DS
IMT-MC
IMT-TC
IMT-SC

Ans: D

The period of a satellite, the time required for a satellite to make a complete trip around the Earth, is determined by _____ law.

Kepler's
Newton's
Ohm's
none of the above

Ans: A

The signal from a satellite is normally aimed at a specific area called the _____.

path
effect
footprint
none of the above

Ans: C

There is (are) _____ orbit(s) for a GEO satellite.

one
two
many
none of the above

Ans: A

MEO satellites are located at altitudes between km.

3000 and 5000
5000 and 10,000
5000 and 15,000
none of the above

Ans: C

LEO satellites are normally below an altitude of _____ km.

1000
2000
3000
none of the above

Ans: B

_____ is based on a principle called trilateration.

GPS
Teledesic
Iridium
none of the above

Ans: A

Low-Earth-orbit (LEO) satellites have _____ orbits.
equatorial
polar
inclined
none of the above
Ans: B

A GEO is at the _____ orbit and revolves in phase with Earth.
equatorial
polar
inclined
none of the above
Ans: A

GPS satellites are _____ satellites.
GEO
MEO
LEO
none of the above
Ans: B

_____ satellites provide time and location information for vehicles and ships.
GPS
Iridium
Teledesic
none of the above
Ans: A

Iridium satellites are _____satellites.
GEO
MEO
LEO
none of the above
Ans: C

_____ satellites can provide direct universal voice and data communications for handheld terminals.
GPS
Iridium
Teledesic
none of the above
Ans: B

Teledesic satellites are _____satellites.
GEO

MEO
LEO
none of the above
Ans: C

_____ satellites will provide universal broadband Internet access.
GPS
Iridium
Teledesic
none of the above
Ans:

122. Which channel is used to transmit random access signals?
BCCH
CCCH
SDCCH
TCH
Ans: B

123. Which one of the following is the combination of main BCCH?
TCH+SACCH
FCH+SCH+BCH+CCCH
SDCCH/8+SACCH/8
FCH+SCH+BCH+SDCCH+SACCH
Ans: B

124. The Value Range of Timing Advance (TA) in GSM is?
0-31
0-127
0-63
0-7
Ans: C

125. How many MS can be paged with 1 paging massage with IMSI?
1
2
3
4
Ans: B

126. Directed Retry handover means?
TCH to TCH
SDCCH to TCH
SDCCH to SDCCH
None of Above
Ans: B

127. How many neighbors are measured by MS at a time?
5
6
7
8
Ans: B

128. Time Duration of Super Frame?
3 Hour 28 minutes 53 seconds 760 ms
6.12 seconds
235.65 ms
120 ms
Ans: B

129. Maximum number of characters allowed in one SMS?
160
170
180
150
Ans: A

If you have 5 MHz frequency band what will be the maximum number of channels as per GSM system?
25
35
20
24
Ans: A

132. Which kind of Handovers more desired in the Network?
Rx Level
Power Budget
Rx Quality
Interference
Ans: B

133. SDCCH holding time for Normal location update is
3.8ms
3.5sec
3.5ms
None of them
Ans: B

134. SDCCH holding time for call setup (MOC) is
2.7sec

3.5sec
2.7ms
3.5ms
Ans: A

_____ supports the operation and maintenance of GSM.
a) BSS
b) NSS c)
OSS d)
MSC
View
Answer
Answer: c

BE (E&TC) – Mobile Communication

Unit I - Switching techniques for Voice and Data

1) If ‘n’ number of users are present in a network with point-to-point links, then how many links will be required in the network?
a. n (n – 1) b. n (n – 1) / 2 c. n (n – 1) / 4 d. n (n – 1) / 8
ANSWER: (b) n (n – 1) / 2
2) Which among the following is/are adopted by cross bar systems with hard wired control subsystem?
a. Relays b. Latches c. Both a and b d. None of the above
ANSWER: (c) Both a and b
3) Which kind of switching technique indicates the transfer of coded values from input to output during the same interval of time?
a. Space Switching b. Time Switching c. Combination Switching d. None of the above
ANSWER: (a) Space Switching
4) What is the hardware, used to establish connection as an electrical path between inlet and outlet pair in switching system, known as?
a. Switching Matrix b. Switching Network c. Both a and b d. None of the above
ANSWER: (c) Both a and b

5) In folded type of network, ____
a. input lines are folded back to output lines b. output lines are folded back to input lines c. input lines are folded back to themselves (input lines) d. output lines are folded back to themselves (output lines)
ANSWER: (b) output lines are folded back to input lines
6) The ratio of number of successful calls to the number of call attempts is known as _____
a. Call Completion Rate (CCR) b. Call Block Rate (CBR) c. Busy Hour Call Rate (BHCR) d. None of the above
ANSWER: (a) Call Completion Rate (CCR)
7) If a telephone exchange serves 1500 users with the average BHCA of about 9000 and CCR is about 50%, what would be the busy hour calling rate?
a. 2 b. 3 c. 4.5 d. 5
ANSWER: (b) 3
8) How is the relation between Erlang and CCS specified?
a. 1 Erlang = 36 CCS b. 1 Erlang = 56 CCS c. 1 Erlang = 76 CCS d. 1 Erlang = 96 CCS
ANSWER: (a) 1 Erlang = 36 CCS
9) Percentage of occupancy can be defined as the percentage of _____ for which the server seems to be busy.
a. speed b. distance c. time d. volume

ANSWER: (c) time
10) By which name/s is the Grade of Service (GOS) well-known?
a. Call congestion b. Time congestion c. Both a and b d. None of the above
ANSWER: (a) Call congestion
11) Which among the following provides TRG access to outgoing junctions through the two stage network?
a. Expander b. Distributor c. Concentrator d. Router
ANSWER: (d) Router
12) Which shape of switches are not adopted normally due to non-usability of both way trunks?
a. Circular b. Triangular c. Hexagonal d. Square
ANSWER: (b) Triangular
13) In graded groups, switches with inaccessibility to the outgoing route gets ____ into the number of separate groups.
a. added b. subtracted c. multiplied d. divided
ANSWER: (c) multiplied
14) Which form/s of grading design has/have the tendency to share every trunk between equal number of groups?
a. Homogeneous Grading b. Heterogeneous Grading

c. Skipped Grading d. All of the above
ANSWER: (a) Homogeneous Grading
15) For the two-group grading consisting of 14 trunks, availability = 5, A_k = 1.4E and the required grade of service of about 0.01, what would be its traffic capacity?
a. 4.98 E b. 6.72 E c. 8.3 E d. 10 E
ANSWER: (a) 4.98 E
16) Which among the following controls the dynamic characteristics of Phase Locked Loop (PLL)?
a. Low Pass Filter b. High Pass Filter c. Band Pass Filter d. Band Stop Filter
ANSWER: (a) Low Pass Filter
17) After the application of line frequency in Phase Locked Loop (PLL), at which stage do/ does the VCO frequency start to exhibit variation?
a. Free running b. Capture c. Phase Lock d. All of the above
ANSWER: (b) Capture
18) What is an acceptable value of dividing point between the wander and jitter?
a. 10 Hz b. 20 Hz c. 50 Hz d. 200 Hz
ANSWER:(a) 10 Hz

19) If the voltage controlled by VCO exhibits variation at faster and rapid rate, then the instability of clock is known as _____
a. Clock wander b. Clock jitter c. Clock frequency d. Clock period
ANSWER: (b) Clock jitter
20) Which theorem in random jitter specifies the composite effect of various uncorrelated noise sources despite the distribution approaches to Gaussian distribution?
a. Initial Value Theorem b. Final Value Theorem c. Central Limit Theorem d. None of the above
ANSWER: (c) Central Limit Theorem
21) Which type of data network supports the interconnection of computers within highly populated area?
a. LAN b. WAN c. MAN d. None of the above
ANSWER: (c) MAN
22) Which among the following is/are supported by LAN?
a. PABX b. PSTN c. SBDN d. All of the above
ANSWER: (a) PABX
23) If the voice channel is free in PSTN, then what would be the maximum data rate supported by 3.1 kHz bandwidth of voice channel?
a. 2000 bps b. 4000 bps c. 6000 bps d. 8000 bps

ANSWER: (c) 6000 bps
24) In Phase Shift Keying, how many bit/s is/are allowed to be transmitted per shift?
a. 1 b. 2 c. 4 d. 8
ANSWER: (b) 2
25) Which among the following utilizes the transmission line upto 85 – 95 %?
a. Voice Traffic b. Data Traffic c. Both a and b d. None of the above
ANSWER: (a) Voice Traffic
26) If the system is designed with the usage of hexagonal-shaped cells, how are the base-stations located?
a. At the centre of cell b. At the edge of cell c. At the corner of the cell d. All of the above
ANSWER: (d) All of the above
27) Which antennas are used at the center of the cells for the system with hexagonal-shaped cells?
a. Omni-directional antennas b. Sectored directional antennas c. Both a and b d. None of the above
ANSWER: (a) Omni-directional antennas
28) In a cellular telephone system, which type of interference results from imperfect design of filters in receivers by allowing nearby frequencies to enter the receiver?
a. Co-channel Interference b. Adjacent-channel Interference

c. Both a and b d. None of the above
ANSWER: (b) Adjacent-channel Interference
29) Which effect is widespread in adjacent-channel interference especially after the reception of a weak signal by a mobile user from the base-station?
a. Near-far effect b. Doppler's effect c. Capture effect d. Kendall effect
ANSWER: (a) Near-far effect
30) Which method of cellular network assists in minimizing the co-channel interference associated with the angle of degree?
a. Cell Splitting b. Cell Sectoring c. Cell Segmentation & Dualization d. None of the above
ANSWER: (b) Cell Sectoring
31) Which type of connection takes place between an incoming trunk and an outgoing trunk?
a. Local call b. Outgoing call c. Incoming call d. Transit call
ANSWER: (d) Transit call
32) In message switching system, an incoming message gets ____ especially if the required route is busy.
a. lost b. stored in a queue & retransmitted c. sampled d. recovered
ANSWER: (b) stored in a queue & retransmitted
33) Which type of switching network involves the establishment of a dedicated path between two stations?

a. Message Switching b. Packet Switching c. Circuit Switching d. Manual Switching
ANSWER: (c) Circuit Switching
34) In packet switching, what does the header of each short size of packet consist of?
a. Source address b. Destination address c. Intermediate nodes d. All of the above
ANSWER: (d) All of the above
35) In manual switching, which kind of battery exchange has the provision of subscribers set along with magneto generator?
a. Local battery exchange b. Central battery exchange c. Both a and b d. None of the above
ANSWER: (a) Local battery exchange
36) If a group of trunk is offered 1200 calls during the busy hour & 20 calls are lost along with the average call duration of about 7 min, then what would be the total duration of congestion period?
a. 21.6 sec b. 42.2 sec c. 57.6 sec d. 98.2 sec
ANSWER: (c) 57.6 sec
37) In analyzing the traffic performance, how is the number of trunk decided with the provision of the Grade of Service (GoS) especially for larger group?
a. By normal load condition b. By overload condition c. By underload condition d. None of the above
ANSWER: (b) By overload condition

38) If the queuing systems are connected in tandem configuration, what would be the nature of delay?
a. Commutative b. Distributive c. Cumulative d. Deductive
ANSWER: (c) Cumulative
39) Which type of holding time distribution is assumed for the voice conversation on telephone?
a. Constant b. Exponential c. Both a and b d. None of the above
ANSWER: (b) Exponential
40) Which model of loss system allows the usage of Poisson distribution model for traffic analysis especially by assuming infinite number of users?
a. Lost Calls Cleared (LCC) b. Lost Calls Returned (LCR) c. Lost Calls Held (LCH) d. None of the above
ANSWER: (a) Lost Calls Cleared (LCC)
41) In two-stage network, which phenomenon/situation occurs due to impossible connectivity of given incoming trunk to selected outgoing trunk specifically because of link utilization for other connection between primary and secondary switches?
a. Bursting b. Blinking c. Blocking d. Burning
ANSWER: (c) Blocking
42) Which kind of switching system does not comprise any subscriber, concentrator or expander?

a. Crossbar b. Director Exchange c. Strowger d. Tandem
ANSWER: (d) Tandem
43) By how many times does the time division exchange exhibit connection and disconnection with respect to every millisecond, due to its ability of using rearrangeable networks?
a. 2 b. 4 c. 8 d. 16
ANSWER: (c) 8
44) Which signals are regarded as call-progress signals as they are sent back to inform the caller about the progress of the call?
a. Address Signals b. Status Signals c. Call request Signals d. Answer Signals
ANSWER: (b) Status Signals
45) Which among the following exhibit/s the necessity of trunks during the signaling mechanism?
a. Inchannel Signaling b. Common Channel Signaling c. Both a and b d. None of the above
ANSWER: (a) Inchannel Signaling
46) Phase jitter is generated by an additive noise on a _____sinusoidal wave.
a. continuous b. sampled c. discrete d. distorted
ANSWER: (a) continuous

47) What is /are the purpose/s of pulse stuffing in an asynchronous multiplexing?
a. Removal of slips & the need for clock synchronization b. Usability of output channel with higher rate than input c. Creation of timing adjustments d. All of the above
ANSWER: (d) All of the above
48) In digital network synchronization, which approach indicates the cost burden carrying of highly accurate and redundant timing sources by means of smaller switching nodes?
a. Packetization b. Master Slave Clocking c. Network Wide Pulse Stuffing d. Plesiochronous Network
ANSWER: (d) Plesiochronous Network
49) If the desired connection has a low completion probability, which type of flow control technique is used for eliminating the capture of common resources?
a. Trunk Directionalization b. Cancellation of Alternate Routing c. Code Blocking d. Centralized Connection Control
ANSWER: (d) Centralized Connection Control
50) In network management, managing the rate at which the traffic enters a network is known as _____
a. Flow control b. Routing control c. Data control d. All of the above
ANSWER: (a) Flow control
51) Which among the following can be adopted as a dedicated path between the source and destination in circuit switching?

a. Physical Wire b. Radio Link c. Co-axial Cable d. All of the above
ANSWER: (d) All of the above
52) The transfer of user messages from node to another by means of store and forward switching network is known as _____
a. jitter b. scaling c. hop d. entity
ANSWER: (c) hop
53) Consider the statements given below. Which among them represents the operational step executed in datagram Packet Switched Network?
a. Fixed Path is assigned between nodes from source to destination b. First Come First Serviced basis is applicable c. Necessity of an identifier for a connection between source host & destination host d. Transmission of short messages of one or two packet length
ANSWER: (d) Transmission of short messages of one or two packet lengths
54) In Protocol Data Units (PDUs), where do/does the data get/s interchanged?
a. Between peer entities b. Between entities of neighboring layers c. Between 'N' & 'N+1' layers d. All of the above
ANSWER: (a) Between peer entities
55) Which type of framing technique/s reduce/s the problem of synchronization of the receiver?
a. Character Count b. Character Stuffing c. Bit Stuffing d. All of the above
ANSWER: (b) Character Stuffing

56) If more number of cells are necessary in the frequency reuse distance, then the segmentation & dualization techniques get _____
a. united b. divided c. restricted d. filtered
ANSWER: (a) united
57) Which hand-off stage deals with the relinquishment of unnecessary frequency channels by keeping the availability for other mobile users?
a. Initialization b. Resource Reservation c. Call Execution d. Call Completion
ANSWER: (d) Call Completion
58) Which among the following represents the flawless hand-off with no perceivable interruption of service?
a. Hard hand-off b. Soft hand-off c. Intracell hand-off d. Intercell hand-off
ANSWER: (b) Soft hand-off
59) In cellular telephone network, which component controls the switching between public wireline telephone network and the base station of cells for supporting the different calls between landline to mobile, mobile to landline and mobile to mobile calls?
a. Electronic Switching Center (ESC) b. A Cell Controller c. Radio Transmitter & Receiver d. A common communication protocol
ANSWER: (a) Electronic Switching Center (ESC)
60) In Electronic Switching Centre (ESC), the transmission rate of X.25 protocol is ____9.6 Kbps.
a. Less than b. Equal to

c. Greater than d. None of the above
ANSWER: (c) Greater than
61) Which type of connection takes place between an incoming trunk and an outgoing trunk?
a. Local call
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c. Incoming call
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ANSWER: d. Transit call
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c. Greater than
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ANSWER: c. Greater than

BE (E&TC) – Mobile Communication

Unit II - Traffic Engineering and Signalling

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a. 21.6 sec
b. 42.2 sec
c. 57.6 sec
d. 98.2 sec
ANSWER: c. 57.6 sec
Explanation:
No explanation is available for this question!
2. Which model of loss system allows the usage of Poisson distribution model for traffic analysis especially by assuming infinite number of users?
a. Lost Calls Cleared (LCC)
b. Lost Calls Returned (LCR)
c. Lost Calls Held (LCH)
d. None of the above
ANSWER: a. Lost Calls Cleared (LCC)
3. Which type of holding time distribution is assumed for the voice conversation on telephone?
a. Constant
b. Exponential
c. Both a and b
d. None of the above
ANSWER: b. Exponential

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a. Commutative
b. Distributive
c. Cumulative
d. Deductive
ANSWER: c. Cumulative
5. In analyzing the traffic performance, how is the number of trunk decided with the provision of the Grade of Service (GoS) especially for larger group?
a. By normal load condition
b. By overload condition

c. By underload condition
d. None of the above
ANSWER: a. By overload condition
6. By which name/s is the Grade of Service (GOS) well-known?
a. Call congestion
b. Time congestion
c. Both a and b
d. None of the above
Answer Explanation
ANSWER: Call congestion
7. Percentage of occupancy can be defined as the percentage of _____ for which the server seems to be busy.
a. speed
b. distance
c. time
d. volume
ANSWER: c. time
8. How is the relation between Erlang and CCS specified?
a. 1 Erlang = 36 CCS
b. 1 Erlang = 56 CCS
c. 1 Erlang = 76 CCS
d. 1 Erlang = 96 CCS
ANSWER: a. 1 Erlang = 36 CCS
9. If a telephone exchange serves 1500 users with the average BHCA of about 9000 and CCR is about 50%, what would be the busy hour calling rate?
a. 2
b. 3
c. 4.5
d. 5
ANSWER: b. 3
10. The ratio of number of successful calls to the number of call attempts is known as _____
a. Call Completion Rate (CCR)
b. Call Block Rate (CBR)
c. Busy Hour Call Rate (BHCR)
d. None of the above
ANSWER: a. Call Completion Rate (CCR)
11. In International Telephone Numbering, a digit or combination of digits characterizing the called numbering area within a country is called _____ code.
a. Local

b. CCITT
c. Baudot
d. Area
View Answer:
Answer: Option D
Solution:
12. The last two digits of the loaded cable designation 22E66 indicates
a. Spacing
b. Coil inductance
c. Wire gauge
d. Attenuation
View Answer:
Answer: Option B
Solution:
13. A condition of a telephone handset, in which it can be called, is _____ condition.
a. On-hook
b. Off-hook
c. Busy
d. None of these
View Answer:
Answer: Option A
Solution:
14. When digits 3 is dialed using touch tone system, the amount of time needed to send the tone is
a. 0.1 sec
b. 50 msec
c. 0.25 sec
d. 0.25 sec
View Answer:
Answer: Option B
Solution:
15. A telephone number perform the following operations except
a. To route the call
b. To activate the necessary apparatus for proper call charging
c. To order clearing of connection
d. None of the above
View Answer:
Answer: Option C

Solution:
16. The number to be dialed or called to reach a subscriber in the same local network or numbering area is
a. Local code
b. Area code
c. Toll access code
d. Subscriber No.
View Answer:
Answer: Option D
Solution:
17. That part of the telephone network between the telephone instrument at the subscriber premises and the central office equipment is called the _____.
a. Inter-office trunk
b. Tie line
c. Subscriber loop
d. Service drop wire
View Answer:
Answer: Option C
Solution:
18. A line linking telephone central offices is called _____ line.
a. Tie
b. Inter-office trunk
c. Routing
d. Connector
View Answer:
Answer: Option B
Solution:
19. A signalling technique wherein a number of voice paths is carried over one common channel instead of having individual voice channels.
a. In band signalling
b. Out of band signalling
c. Common channel signalling
d. Alternate channel signalling
View Answer:
Answer: Option C
Solution:

20. _____ is a unit of telephone traffic defined as one user making a call of one second duration.
a. CCS
b. Call-second
c. Erlangs
d. Call-hour
View Answer:
Answer: Option B
Solution:
21. During a busy hour in a telephone system an average of one call is lost, then the grade of service is considered to be:
a. 1.01
b. 10%
c. 0.10%
d. 0.01
View Answer:
Answer: Option D
Solution:
22. If a busy counts are made during the span of 15 minutes, and the average number of occupied circuit is found to be 8, then the traffic, in Erlang, is:
a. 2
b. 8
c. 6
d. 4
View Answer:
Answer: Option A
Solution:
23. In a standard CCITT group, 12 channels FDM, the carrier frequency of the channel No. 1 is _____.
a. 100 kHz
b. 102 kHz
c. 108 kHz
d. 60 kHz
View Answer:
Answer: Option C
Solution:
24. In the FDM hierarchy, a mastergroup is composed of ten supergroups and is equivalent to

a. 600 channels
b. 60 channels
c. 180 channels
d. 120 channels
View Answer:
Answer: Option A
Solution:
25. The approximation process in PCM creates noise called:
a. Thermal
b. White noise
c. Quantizing noise
d. Agitation noise
View Answer:
Answer: Option C
Solution:
26. The criteria to be considered in designing a telephone system
a. Attenuation limit
b. Resistance limit
c. A or B
d. A and B
View Answer:
Answer: Option D
Solution:
27. This refers to loop AC reference frequency measured in decibels
a. Signalling limits
b. Resistance limits
c. Attenuation limits
d. All of these
View Answer:
Answer: Option C
Solution:
28. An inuction coil which is multiple winding transformer intended to interface a 2-wire circuit to be a 4-wire circuit to permit two-way transmission of signals.
a. Hybrid function
b. Speech transformer
c. Transmission regulation circuit
d. A or B

View Answer:
Answer: Option D
Solution:
29. A subscriber loop signalling method in which signalling information is indicated by the presence and absence of a battery and ground condition on the line at the called end of the trunk.
a. Wet-Dry
b. Reverse Battery
c. High-Low
d. Supervisory
View Answer:
Answer: Option A
Solution:
30. An arrangement where the only possible connection between a number of exchanges is through a single tandem or transit exchange where they are all connected.
a. Mesh
b. Star
c. Composite
d. Ring
View Answer:
Answer: Option B
Solution:
31. CCITT recommendation E-161 recommends that not more than _____ digits make up an international number, excluding the international prefix.
a. 10
b. 12
c. 16
d. 20
View Answer:
Answer: Option B
Solution:
32. The following are the transmission media used for telephone systems except:
a. Parallel wire
b. Coaxial wire
c. Fiber optics
d. None of these
View Answer:
Answer: Option D

Solution:
33. The subscriber loop provides the following except:
a. Talk battery
b. Ringing voltage
c. Telephone dial
d. Current during on hook
View Answer:
Answer: Option D
Solution:
34. A method of multiplexing in which the total frequency spectrum available is used by each channel, but not part of the time.
a. FDM
b. TDM
c. SDM
d. GSM
View Answer:
Answer: Option B
Solution:
35. The primary cause of echo and singing is
a. Intermodulation noise
b. Crosstalk
c. Impedance mismatch
d. Thermal noise
View Answer:
Answer: Option C
Solution:
36. For crosstalk to be considered intelligible, at least _____ words are intelligible to the listener in a seven second period.
a. 5
b. 6
c. 4
d. 3
View Answer:
Answer: Option C
Solution:
37. Noise that is non-continuous, consisting of irregular pulse or noise spikes of short duration and of relatively high amplitude.

a. Solar
b. Intermodulation
c. Impulse
d. Crosstalk
View Answer:
Answer: Option C
Solution:
38. The signal to noise ratio for voice based on customer satisfaction is
a. 30 db
b. 35 db
c. 15 db
d. 20 db
View Answer:
Answer: Option A
Solution:
39. dBa is a noise unit which uses a tone of 1000 Hz and a power level of
a. -85 dBm
b. -90 dBm
c. 85 dBm
d. -80 dBm
View Answer:
Answer: Option A
Solution:
40. The average intensity in one or more traffic paths occupied in the busy hour by one 2-minute call for an aggregate duration of two minutes.
a. CCS
b. Cm
c. Erlang
d. EBHC
View Answer:
Answer: Option D
Solution:
41. A method of handling lost calls wherein a call failing to immediately find a server, waits enters a queue until one becomes available.
a. Lost Calls Cleared
b. Lost Calls Held
c. Lost Calls Delayed

d. None of these
View Answer:
Answer: Option C
Solution:
42. The main terminal used as cross connection point for cables 300 pairs and above.
a. MTTC
b. MDF
c. DP
d. TTC
View Answer:
Answer: Option B
Solution:
43. For PCM, the sampling theorem states that the sampling frequency must be _____ the highest frequency contained in the analog signal.
a. twice
b. more than twice
c. less than twice
d. equal to
View Answer:
Answer: Option B
Solution:
44. a group of sixty voice channels with bandwidth of 240 kHz is called a
a. group
b. supergroup
c. mastergroup
d. jumbogroup
View Answer:
Answer: Option B
Solution:
45. On the subscriber’s telephone set employing the touch tone technique, how many signals are transmitted to the telephone exchange for every button that is pressed?
a. 2 VHF signals
b. 1 VHF and 1 AF
c. 2 AF tones
d. 16 AF tones
View Answer:
Answer: Option C

Solution:
46. An electronic circuit which is inserted into the 4-wire trunk path effectively to block the passage of reflected signal energy
a. Echo suppressor
b. Loading coil
c. Loop extender
d. Telephone amplifier
View Answer:
Answer: Option A
Solution:
47. The following are signalling functions except:
a. Ringing signals
b. Address signals
c. Supervisory signals
d. None of these
View Answer:
Answer: Option D
Solution:
48. The standard spacing for 19-D-88 cable loading code is
a. 700 ft.
b. 6000 ft.
c. 4500 ft.
d. 3000 ft.
View Answer:
Answer: Option C
Solution:
49. A telephone exchange has a subscriber loop limit of 1800 ohms, excluding the telephone instrument. What is the farthest distance, in miles, that a subscriber can be located away from the telephone exchange, if AWG 26 cable, which has a resistance of 431 ohms/loop mile, is used?
a. 5.95
b. 8.18
c. 3.9
d. 4.18
View Answer:
Answer: Option D
Solution:
50. The Strowger or step-by-step system falls under what type of switching control system?

a. Manual
b. Progressive
c. Common
d. Automatic
View Answer:
Answer: Option B
Solution:
51. For building telephone facilities, the size of entrance conduit shall not be less than _____ in diameter.
a. 30 mm
b. 50 mm
c. 60 mm
d. 75 mm
View Answer:
Answer: Option B
Solution:
52. In telephony, tone dialing takes _____ time than pulse dialing.
a. Less
b. More
c. About the same
d. Can’t be determined
View Answer:
Answer: Option A
Solution:
53. A telephone service wherein calls are rerouted into a preassigned station is called _____.
a. Camp-On
b. Call Forwarding
c. Call Barring
d. Abbreviated Dialing
View Answer:
Answer: Option B
Solution:
54. What type of control system crossbar switches are operating?
a. Manual
b. Progressive
c. Common
d. Automatic
View Answer:

Answer: Option C
Solution:
55. PABX stands for
a. Private All-purpose Broadcasting Exchange
b. Private Automatic Branch Exchange
c. Public Access Bidirectional Exchange
d. Public Address Broadcasting Exchange
View Answer:
Answer: Option B
Solution:
56. A trunk is
a. The base of a communication tower
b. A telephone line connecting two C.O.'s
c. A line connecting one telephone set to the PABX
d. The structure where antenna are attached
View Answer:
Answer: Option B
Solution:
57. The voice frequency channel pass band is:
a. 0 to 4000 Hz
b. 300 to 3000 Hz
c. To carry only speech
d. All of the preceding
View Answer:
Answer: Option A
Solution:
58. What is used to transmit more than one conversation over a path?
a. Hybrid
b. Tandem
c. Multiplexing
d. All of the above
View Answer:
Answer: Option C
Solution:
59. The common channel interoffice signalling method
a. Uses the same channel for signalling as for the related conversation

b. Is used on local loops
c. Uses a separate channel for signalling only
d. Comes the signalling for one related conversation
View Answer:
Answer: Option C
Solution:
60. Telephone switching is accomplished by
a. Manual Switchboard
b. Step-by-step Switches
c. Crossbar switches
d. Any of the these
View Answer:
Answer: Option D
61. In a wireless communication, base station is connected to central hub called _____
a) PSTN
b) MSC
c) CO
d) PBX
View Answer
Answer: b
62. PSTN stands for _____
a) Public switched telephone network
b) Personal switched telephone network
c) Personal switched telephone node
d) Public switched telephone node
View Answer
Answer: a
63. MSCs provide connectivity between PSTN and the base stations.
a) True
b) False
View Answer
Answer: a
64. Communication protocol, CAI stands for _____
a) Common air interchange
b) Control air interchange
c) Common air interface
d) Control air interchange
View Answer
Answer: a

65. At the base station, the air interface portion of mobile transmission is passed to MSC.
a) True
b) False
View Answer
Answer: b
66. PSTN is _____ and wireless networks are _____
a) Highly dynamic, virtually static
b) Static, virtually static
c) Highly dynamic, virtually dynamic
d) Virtually static, highly dynamic
View Answer
Answer: d
67. In public switched telephone network, LATA stands for _____
a) Local access and transport area
b) Land area and transport area
c) Local access and telephone access
d) Local area and telephone access
View Answer
Answer: a
68. LATAs are connected by a company called _____
a) Land exchange carrier
b) Local exchange carrier
c) Local control exchange
d) Land area exchange
View Answer
Answer: b
69. A long distance telephone company that collects toll is called _____
a) LATA
b) LEC
c) PSTN
d) IXC
View Answer
Answer: d
70. Wireless networks are extremely hostile and random nature of radio channel.
a) True
b) False
View Answer
Answer: a
71. The technique for separate but parallel signalling channel is called _____
a) Common channel signalling

b) Forward channel signalling
c) Reverse channel signalling
d) Separate channel signalling
View Answer
Answer: a
72. In North America, the cellular telephone signalling network uses _____
a) SS7
b) IXC
c) IS-41
d) PSTN
View Answer
Answer: a
73. What is the concept for accommodating a large number of users in a limited radio spectrum?
a) Grade of service
b) Trunking
c) Multiplexing
d) Multitasking
View Answer
Answer: b
74. On termination of call, the occupied channel is not returned to the pool of available channels in trunking.
a) True
b) False
View Answer
Answer: b
Explanation: In a trunked radio system, each user is allocated a channel on a per call basis. Upon termination of the call, the previously occupied channel is immediately returned to the pool of available channels. It is a method for a system to provide network access to many clients by sharing a set of lines or frequencies instead of providing them individually.
75. In trunking system, when the channel is already in use, the call is blocked or queued.
a) True
b) False
View Answer
Answer: a
76. Who developed the fundamental of trunking theory?
a) Newton
b) Ohm
c) Erlang
d) Einstein
View Answer
Answer: c

77. What is the unit for the measure of traffic intensity?
a) Meters
b) Henry
c) Ohm
d) Erlang
View Answer
Answer: d
78. One Erlang represents _____
a) One call- hour per hour
b) One call-minute per hour
c) One call- hour per minute
d) Many calls- hour per hour
View Answer
Answer: a
79. What is the measure of the ability of user to access a trunked system during the busiest hour?
a) Trunking
b) Grade of Service (GOS)
c) Multiplexing
d) Sectoring
View Answer
Answer: a
80. GOS is typically given as a likelihood that a _____
a) Call is in progress
b) Channels are busy
c) Call is blocked
d) Channel are free
View Answer
Answer: c
81. The time requires to allocate a trunked radio channel to a requesting user is called _____
a) Dwell time
b) Holding time
c) Run time
d) Set up Time
View Answer
Answer: d
82. Average duration of a typical call is called _____
a) Holding time
b) Dwell time
c) Set up time
d) Run time

View Answer
Answer: a
83. The average number of call requests per unit time is also known as _____
a) Request rate
b) Load
c) Grade o Service
d) Traffic intensity
View Answer
Answer: a
84. Traffic intensity offered by each user is the product of _____
a) Set up time and holding time
b) Call request rate and holding time
c) Load and holding time
d) Call request rate and set up time
View Answer
Answer: b
85. AMPS cellular system is designed for a GOS of _____ blocking.
a) 10%
b) 50 %
c) 2%
d) 1%
View Answer
Answer: c
86. Blocked calls cleared formula is also known as _____ formula.
a) Erlang C
b) Erlang A
c) Erlang D
d) Erlang B
View Answer
Answer: d
87. Blocked calls delayed formula is also known as _____
a) Erlang A
b) Erlang B
c) Erlang C
d) Erlang D
View Answer
Answer: c

BE (E&TC) – Mobile Communication

Unit III - Cellular Concept

1) The modulation technique used for mobile communication systems during world war II was
a. Amplitude modulation
b. Frequency modulation
c. ASK
d. FSK
ANSWER: Frequency modulation
2) ——— introduced Frequency Modulation for mobile communication systems in 1935.
a. Edwin Armstrong
b. Albert Einstein

c. Galileo Galilei
d. David Bohm
ANSWER: Edwin Armstrong
3) The early FM push-to-talk telephone systems were used in
a. Simplex mode
b. Half duplex mode
c. Full duplex mode
d. None of the above
ANSWER: Half duplex mode
4) DECT stands for
a. Digital European Cellular Telex
b. Digitized Emergency Cellular Telephone
c. Digital European Cordless Telephone
d. Digital European Cellular Telephone
ANSWER: Digital European Cordless Telephone
5) World's first cellular system was developed by
a. Nippon Telephone and Telegraph (NTT)
b. Bellcore and Motorola
c. AT&T Bell Laboratories
d. Qualcomm
ANSWER: Nippon Telephone and Telegraph (NTT)
6) Paging systems were based on
a. Simplex systems
b. Half duplex systems
c. Full duplex systems

d. None of the above
ANSWER: Simplex systems
7) Paging systems could be used to
a. Send numeric messages
b. Send alphanumeric messages
c. Voice message
d. All of the above
ANSWER: All of the above
8) Garage door opener is a
a. Transmitter
b. Receiver
c. Transceiver
d. None of the above
ANSWER: Transmitter
9) Carrier frequency of a TV remote control is in the range
a. of Infra red
b. < 100 MHz
c. < 1 GHz
d. < 2 GHz
ANSWER: of Infra red
10) Half duplex system for communication has
a. Communication in single direction
b. Communication in single direction at a time
c. Communication in both directions at the same time
d. None of the above
ANSWER: Communication in single direction at a time
11) MIN stands for
a. Mobile Identification Number
b. Mobile Internet
c. Mobility In Network
d. None of the above
ANSWER: Mobile Identification Number
12) The process of transferring a mobile station from one base station to another is
a. MSC
b. Roamer
c. Hand off
d. Forward channel
ANSWER: Hand off
13) PCN is

a. Wireless concept of making calls
b. For receiving calls
c. Irrespective of the location of the user
d. All of the above
ANSWER: All of the above
14) IMT-2000 is a digital mobile system that functions as
a. Pager
b. Cordless
c. Low earth orbit satellites
d. All of the above
ANSWER: All of the above
15) The 2G cellular network uses
a. TDMA/FDD
b. CDMA/FDD
c. Digital modulation formats
d. All of the above
ANSWER: All of the above
16) NADC is a 2G standard for
a. TDMA
b. CDMA
c. Both a & b
d. None of the above
ANSWER: TDMA
17) 2G CDMA standard – cdma one supports up to
a. 8 users
b. 64 users
c. 32 users
d. 116 users
ANSWER: 64 users
18) 2G standards support
a. Limited internet browsing
b. Short Messaging Service
c. Both a & b
d. None of the above
ANSWER: Both a & b
19) The 2G GSM technology uses a carrier separation of
a. 1.25 MHz
b. 200 KHz
c. 30 KHz
d. 300 KHz

ANSWER: 200 KHz
20) 3G W-CDMA is also known as
a. UMTS
b. DECT
c. DCS-1800
d. ETACS
ANSWER: UMTS
21) Commonly used mode for 3G networks is
a. TDMA
b. FDMA
c. TDD
d. FDD
ANSWER: FDD
22) The minimum spectrum allocation required for W-CDMA is
a. 5MHz
b. 2MHz
c. 500KHz
d. 100KHz
ANSWER: 5MHz
23) CDMA2000 1xEV provides high speed data access with channel allocation of
a. 5 MHz
b. 50 MHz
c. 1.25 MHz
d. 4 MHz
ANSWER: 1.25 MHz
24) In TD-SDMA, there is a frame of _____milliseconds and the frame is divided into _____ time slots.
a. 5, 7
b. 7, 5
c. 2, 5
d. 5, 2
ANSWER: 5, 7
25) The interference between the neighboring base stations is avoided by
a. Assigning different group of channels
b. Using transmitters with different power level
c. Using different antennas
d. All of the above
ANSWER: Assigning different group of channels
26) Radio capacity may be increased in cellular concept by

a. Increase in radio spectrum
b. Increasing the number of base stations & reusing the channels
c. Both a & b
d. None of the above
ANSWER: Increasing the number of base stations & reusing the channels
27) The shape of the cellular region for maximum radio coverage is
a. Circular
b. Square
c. Oval
d. Hexagon
ANSWER: Hexagon
28) Hexagon shape is used for radio coverage for a cell because
a. It uses the maximum area for coverage
b. Fewer number of cells are required
c. It approximates circular radiation pattern
d. All of the above
ANSWER: All of the above
29) Centre excited hexagonal cells use
a. Sectored directional antennas
b. Omni directional antennas
c. Yagi uda antennas
d. None of the above
ANSWER: Omni directional antennas
30) Spectrum Efficiency of a cellular network is
a. The traffic carried by whole network
b. The traffic carried per cell divided by the bandwidth of the system and the area of a cell
c. Expressed in Erlang /MHz /km2
d. Both b and c
e. Both a and c
ANSWER: Both b and c
31) The advantage of using frequency reuse is
a. Increased capacity
b. Limited spectrum is required
c. Same spectrum may be allocated to other network
d. All of the above
ANSWER: All of the above
32) The strategies acquired for channel assignment are
a. Fixed
b. Dynamic

c. Regular
d. Both a and b
e. Both b and c
ANSWER: Both a and b
33) In a fixed channel assignment strategy, if all the assigned channels are occupied, the call
a. Gets transferred to another cell
b. Gets blocked
c. Is kept on waiting
d. All of the above
ANSWER: Gets blocked
34) In a fixed channel assignment strategy
a. Each cell is assigned a predetermined set of frequencies
b. The call is served by unused channels of the cell
c. The call gets blocked if all the channels of the cell are occupied
d. All of the above
ANSWER: All of the above
35) In a dynamic channel assignment strategy,
a. Voice channels are not permanently assigned
b. The serving base station requests for a channel from MSC
c. MSC allocates the channel according to the predetermined algorithm
d. All of the above
ANSWER: All of the above
36) Advantage of using Dynamic channel assignment is
a. Blocking is reduced
b. Capacity of the system is increased
c. Both a & b
d. None of the above
ANSWER: Both a & b
37) Disadvantage of using Dynamic channel assignment is
a. More storage required
b. Calculations and analysis is increased
c. Both a & b
d. None of the above
ANSWER: Both a & b
38) In Dynamic channel assignment, any channel which is being used in one cell can be reassigned simultaneously to another cell in the system at a reasonable distance.
a. True
b. False
ANSWER: True

39) In Handoff
a. Process of transferring the call to the new base station
b. Transfers the call
c. New channel allocation is done
d. All of the above
ANSWER: All of the above
40) Delay in handoffs is caused due to
a. Week signal conditions
b. High traffic conditions
c. Un availability of the channel
d. All of the above
ANSWER: All of the above
41) Inter system Handoffs are done
a. When mobile station moves in two cellular systems with different MSC
b. When mobile station moves between two cellular systems
c. When mobile station receives more power from other base station than the serving base station
d. All of the above
ANSWER: All of the above
42) When a fraction of assigned channel is reserved for handoffs, it is
a. Guard channel concept
b. Fixed channel assignment
c. Dynamic channel assignment
d. None of the above
ANSWER: Guard channel concept
43) While handoffs, the termination of call may be avoided by
a. Providing Guard channel
b. Queuing of handoffs
c. Both a & b
d. None of the above
ANSWER: Both a & b
44) Dwell time is the time for
a. A call within the cell
b. Hand off
c. Waiting for channel allocation
d. None of the above
ANSWER: A call within the cell
45) Dwell time depends upon
a. Interference
b. Distance between the subscriber and the base station
c. Propagation of call

d. All of the above
ANSWER: All of the above
46) In Mobile Assisted Handoff (MAHO), the handoff takes place when
a. The power received by the mobile station from other base station is more than the serving base station
b. The channel allocated is not available
c. The mobile station has no signal
d. All of the above
ANSWER: The power received by the mobile station from other base station is more than the serving base station
47) Mobile Assisted Handoff (MAHO) provides
a. Faster handoffs
b. Suitability for frequent handoffs
c. MSC need not monitor the signal strength
d. All of the above
ANSWER: All of the above
48) Trunking in a cellular network refers to
a. Termination of a call
b. Spectrum unavailability
c. Accommodating large number of users in limited spectrum
d. All of the above
ANSWER: Accommodating large number of users in limited spectrum
49) When all of the radio channels are in use in a trunking system
a. The user is blocked
b. The access to the system is denied
c. The queue may be provided
d. All of the above
ANSWER: All of the above
50) Umbrella cell approach
a. Uses large and small cells
b. Uses different antenna heights
c. Is used for high speed users with large coverage area and low speed users with small coverage area
d. All of the above
ANSWER: All of the above
51) Interference in cellular systems is caused by
a. Two base stations operating in same frequency band
b. Two calls in progress in nearby mobile stations
c. Leakage of energy signals by non cellular systems into cellular frequency band
d. All of the above

ANSWER: All of the above
52) Interference in frequency bands may lead to
a. Cross talk
b. Missed calls
c. Blocked calls
d. All of the above
ANSWER: All of the above
53) Co-channel reuse ratio depends upon
a. Radius of the cell
b. Distance between the centers of the co channel cells
c. Frequency allocation of nearest cells
d. Both a and b
e. Both b and c
ANSWER: Both a and b
54) Increase in Co- channel reuse ratio indicates
a. Better transmission quality
b. Larger capacity
c. Low co-channel interference
d. Both a and c
e. Both a and b
ANSWER: Both a and c
55) Grade of service refers to
a. Accommodating large number of users in limited spectrum
b. Ability of a user to access trunked system during busy hour
c. Two calls in progress in nearby mobile stations
d. High speed users with large coverage area
ANSWER: Ability of a user to access trunked system during busy hour
56) Traffic intensity is expressed in
a. Erlangs /MHz /km2
b. Erlangs
c. λ/ sec
d. dB/sec
ANSWER: Erlangs
57) The techniques used to improve the capacity of cellular systems are
a. Splitting
b. Sectoring
c. Coverage zone approach
d. All of the above
ANSWER: All of the above

58) Distributed antenna systems are used at
a. Transmitters of mobile systems
b. Transmitters of base stations
c. Inputs and outputs of repeaters
d. Receivers of mobile stations
ANSWER: Inputs and outputs of repeaters
59) Antenna down tilting refers to
a. Focusing radio energy towards ground
b. Decreasing the strength of antenna
c. Decreasing the S/N ratio at the antenna input
d. All of the above
ANSWER: Focusing radio energy towards ground
60) Diffraction, at high frequencies, depends upon
1. Geometry of the object
2. Polarization of the incident wave
3. Amplitude of the incident wave
4. Frequency of the incident wave
a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 1, 2 and 3 are correct
61) The rainbow pattern seen on a CD is an example of
a. Reflection
b. Refraction
c. Diffraction
d. None of the above
ANSWER: Diffraction
62) Fresnel Reflection Coefficient is a factor of
1. Polarization of the wave
2. Properties of the material at which reflection occurs
3. Angle of incidence of wave
a. 1 and 2 are correct
b. 1 and 3 are correct
c. All the three are correct
d. 2 and 3 are correct
ANSWER: All the three are correct
63) When a wave falls on a perfect conductor
a. Wave is partially reflected and partially transmitted

b. All incident energy is reflected back without loss of energy
c. Part of energy gets absorbed
d. Both a and c
ANSWER: All incident energy is reflected back without loss of energy
64) Brewster angle is the angle at which
a. No reflection occurs at the first medium
b. Reflection coefficient is zero
c. The wave gets refracted in the direction of source
d. Both a and b
e. Both a and c
ANSWER: Both a and b
65) Fading is caused due to
1. Multi path propagation
2. Obstacles
3. Frequency variations at the source
4. Variation in amplitude and phase at receiver
a. 1 and 2 are correct
b. 1, 2 and 4 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 1, 2 and 4 are correct
66) Coherence time refers to
a. Time required to attain a call with the busy base station
b. Time required for synchronization between the transmitter and the receiver
c. Minimum time for change in magnitude and phase of the channel
d. None of the above
ANSWER: Minimum time for change in magnitude and phase of the channel
67) Fading due to shadowing is
a. Fading due to large obstructions
b. Large coherence time of the channel as compared to the delay constraints
c. Small coherence time of the channel as compared to the delay constraints
d. Both a and b
e. Both a and c
ANSWER: Both a and b
68) Deep fade is
1. Strong destructive interference
2. Drop in signal to noise ratio
3. Temporary failure of message transfer

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: All are correct
69) Doppler spread refers to
a. Signal fading due to Doppler shift in the channel
b. Temporary failure of message transfer
c. Large coherence time of the channel as compared to the delay constraints
d. All of the above
ANSWER: Signal fading due to Doppler shift in the channel
70) Friis free space equation
1. Is an expression for noise power
2. Is a function of transmitting and receiving antenna gain
3. Depends upon the distance between transmitting and receiving antenna
a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 2 and 3 are correct
71) The free space model of propagation refers to
1. Unobstructed line of sight between the transmitter and receiver
2. Satellite communication systems and Microwave line of sight radio links
3. Propagation along the ground surface
a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: 1 and 2 are correct
72) According to Friis free space equation
1. Received power falls with square of the distance between the transmitter and receiver
2. Increases with square of the distance between the transmitter and receiver
3. Received power increases with gains of transmitting and receiving antennas
a. 1 and 2 are correct
b. 1 and 3 are correct
c. All the three are correct
d. 2 and 3 are correct
ANSWER: All the three are correct

73) EIRP is
1. Effective Isotropic Radiated Power
2. Maximum radiated power available by the transmitter
3. A factor of power and gain of transmitter
a. 1 and 2 are correct
b. 1 and 3 are correct
c. All the three are correct
d. 2 and 3 are correct
ANSWER: All the three are correct
74) Spread spectrum modulation involves
1. PN sequence for modulation
2. Large bandwidth
3. Multiple users
a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct
75) PN sequence at the decoder acts as a locally generated carrier at the receiver and decodes the signal using
a. Correlator
b. Adder
c. Frequency divider
d. PLL
ANSWER: Correlator
76) In spread spectrum technique, the multiple users are assigned with
a. Same spectrum and same PN code
b. Same spectrum and different PN code
c. Different spectrum and different PN code
d. Different spectrum and same PN code
ANSWER: Same spectrum and different PN code
77) Advantage of using Spread Spectrum modulation is/are
1. Interference rejection capability
2. Frequency planning is not required
3. Resistance to multipath fading
4. ISI is lesser
a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct

d. All the four are correct
ANSWER: All the four are correct
78) Direct sequence spread spectrum demodulation uses
a. DPSK
b. FSK
c. ASK
d. QPSK
ANSWER: DPSK
79) Fast hopping is
a. More than one frequency hop during each symbol
b. Hopping rate greater than or equal to information symbol rate
c. One or more symbols transmitted between frequency hops
d. Both a and b
e. Both b and c
ANSWER: Both a and b
80) Slow frequency hopping refers to
a. One or more symbols transmitted in time interval between frequency hops
b. More than one frequency hop during each symbol
c. Hopping rate greater than or equal to information symbol rate
d. Both a and c are correct
ANSWER: One or more symbols transmitted in time interval between frequency hops
81) Probability of outage refers to
a. Noise developed at the receiver
b. Number of bit errors during transmission
c. Signal to noise ratio
d. All of the above
ANSWER: Number of bit errors during transmission
82) The digital modulation technique used in frequency selective channels is
a. FSK
b. ASK
c. BPSK
d. QPSK
ANSWER: BPSK
83) Working of Adaptive Equalizers include
a. Training
b. Tracking
c. Modulation
d. Both a and b
e. All a, b and c are correct
ANSWER: Both a and b

84) The time span for which the equalizer converges depends upon
1. Equalizer algorithm
2. Equalizer structure
3. Rate of change of multipath radio channel
4. Amplitude of signal
a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All the four are correct
ANSWER: 1, 2 and 3 are correct
85) The Linear Equalizer may be implemented as
a. FIR filter
b. Lattice filter
c. Low pass filter
d. Both a and b
e. Both a and c
ANSWER: Both a and b
86) Linear equalizer is also known as
a. Transversal filter
b. Lattice filter
c. Low pass filter
d. None of the above
ANSWER: Transversal filter
87) The methods used for non linear equalization are
a. Decision Feedback Equalization
b. Maximum Likelihood Symbol Detection
c. Maximum Likelihood Sequence Estimation
a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. None of the above
ANSWER: 1, 2 and 3 are correct
88) The performance of algorithms for Adaptive Equalization are given by
1. Rate of convergence

2. Computational complexity
3. Numerical properties
4. Frequency change
a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 1, 2 and 3 are correct
89) Computational complexity of an algorithm refers to the
a. Number of operations for one iteration of algorithm
b. Inaccuracies in the mathematical analysis
c. Noise produced during one complete iteration of algorithm
d. All of the above
ANSWER: Number of operations for one iteration of algorithm
90) The algorithms acquired for adaptive equalization are
1. Zero forcing algorithm
2. Least mean squares algorithm
3. Recursive least squares algorithm
a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. None of the above
ANSWER: 1, 2 and 3 are correct
91) Fractionally spaced equalizer acts as
a. Matched filter
b. Equalizer
c. Demodulator
d. Both a and b
e. All a, b and c are correct
ANSWER: Both a and b
92) Diversity employs the decision making at
a. Transmitter
b. Receiver
c. Transmitter and receiver
d. Communication channel
ANSWER: Receiver
93) The diversity schemes are based on
1. Time diversity
2. Frequency diversity

3. Space diversity
4. Polarization diversity
a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All the four are correct
ANSWER: All the four are correct
94) In time diversity
a. Multiple versions of signals are transmitted at different time instants
b. The signal is transmitted using multiple channels
c. Signal is transmitted with different polarization
d. All of the above
ANSWER: Multiple versions of signals are transmitted at different time instants
95) RAKE receiver is
1. Several sub receivers
2. Several correlators
3. Fingers
4. Equalization based
a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All the four are correct
ANSWER: 1, 2 and 3 are correct
96) The RAKE receiver involves the steps
a. Correlator, estimation of transmitted signal, demodulation, bit decision
b. Estimation of transmitted signal, correlator, demodulation, bit decision
c. Estimation of transmitted signal, demodulation, correlator, bit decision
d. Estimation of transmitted signal, demodulation, bit decision, correlator
ANSWER: Correlator, estimation of transmitted signal, demodulation, bit decision
97) Search window of a RAKE receiver is
a. Frequency band of the channel
b. Range of the time delays
c. Range of noise
d. All of the above
ANSWER: Range of the time delays
98) Speech Coders are categorized on the basis of
a. Signal compression techniques
b. Frequency of signal

c. Bandwidth of the signal
d. All of the above
ANSWER: Signal compression techniques
99) Waveform coders and Vocoders are the types of
a. Speech coders
b. Modulation technique
c. Frequency translation methods
d. Channel allocation for transmission
ANSWER: Speech coders
100) PCM, DPCM, DM, ADPCM are the types of
a. Vocoders
b. Waveform coders
c. Channel allocation for transmission
d. All of the above
ANSWER: Waveform coders
101) Speech coding technique that is independent of the source is
a. Vocoders
b. Waveform coders
c. Both a & b
d. None of the above
ANSWER: Waveform coders
102) Advantage of using waveform coders is
1. Independent of the signal source
2. Less complexity
3. Suitable for noisy environments
a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct
103) The type of frequency domain coding that divides the speech signal into sub bands is
a. Waveform coding
b. Vocoders
c. Block transform coding
d. Sub-band coding
ANSWER: Sub-band coding
104) The speech coding technique that is dependent on the prior knowledge of the signal is
a. Waveform coders
b. Vocoders

c. Sub band coding
d. Block transform coding
ANSWER: Vocoders
105) The steps involved in Channel vocoders for speech transmission are
a. Envelope detection, sampling, encoding, multiplexing
b. Sampling, Envelope detection, encoding, multiplexing
c. Envelope detection, encoding, sampling, multiplexing
d. Sampling, Envelope detection, multiplexing, encoding
ANSWER: Envelope detection, sampling, encoding, multiplexing
106) Vocal tract cepstral coefficients and excitation coefficients are separated by
a. Samplers
b. Linear filters
c. Encoders
d. Multiplexers
ANSWER: Linear filters
107) In voice excited vocoders, PCM transmission helps in transmission of
a. High frequency bands of speech
b. Low frequency bands of speech
c. Multiplexed signals
d. Modulated signals
ANSWER: Low frequency bands of speech
108) Linear predictive coders are based on the principle that
1. Current signal sample is obtained from linear combination of past samples
2. Current signal sample is independent of past samples
3. These are time domain vocoders
4. They are among low bit rate vocoders
a. 1, 3 and 4 are correct
b. 2, 3 and 4 are correct
c. 1 and 4 are correct
d. All the four are correct
ANSWER: 1, 3 and 4 are correct
109) Multi pulse excited LPC includes
1. Multiple pulses per period
2. Minimization of weighted mean square error
3. Better speech quality
4. Pitch detection is not required
a. 1 and 4 are correct
b. 1 and 3 are correct
c. 2 and 4 are correct

d. All four are correct
ANSWER: All four are correct
110) In residual excited LPC,
a. The residue of subtraction of generated and original signal is quantized at the transmitter
b. Pitch detection is not required
c. Multiple pulses per period
d. Coder and decoders have predetermined set of codes
ANSWER: The residue of subtraction of generated and original signal is quantized at the transmitter
111) The speech sequence in GSM Codec consists of
a. Pre emphasis, segmentation, windowing, filtering
b. Windowing, Pre emphasis, segmentation, filtering
c. Pre emphasis, windowing, segmentation, filtering
d. Pre emphasis, segmentation, filtering, windowing
ANSWER: Pre emphasis, segmentation, windowing, filtering
112) The windowing technique used for speech coding in GSM Codec is
a. Blackman window
b. Welch window
c. Cosine window
d. Hamming window
ANSWER: Hamming window
113) The received signal at the GSM speech decoder is passed through
a. STP filter
b. LTP filter
c. Quantizer
d. PLL
ANSWER: LTP filter
114) In GSM Codec, the bits encoded for forward error correction are
a. Ia bits
b. Ib bits
c. II bits
d. Both a and b
e. Both a and c
ANSWER: Both a and b
115) The speech coders are selected on the basis of
1. Robustness to transmission errors
2. Cell size
3. Type of modulation technique used
4. Distance between the transmitter and receiver

a. 1 and 4 are correct
b. 1, 2 and 3 are correct
c. 2 and 4 are correct
d. All four are correct
ANSWER: 1, 2 and 3 are correct
116) FDMA is the division of
a. Time
b. Phase
c. Spectrum
d. Amplitude
ANSWER: Spectrum
117) Guard band is
a. The small unused bandwidth between the frequency channels to avoid interference
b. The bandwidth allotted to the signal
c. The channel spectrum
d. The spectrum acquired by the noise between the signal
ANSWER: The small unused bandwidth between the frequency channels to avoid interference
118) Cable television is an example of
a. TDMA
b. FDMA
c. CDMA
d. SDMA
ANSWER: FDMA
119) In FDMA,
1. Each user is assigned unique frequency slots
2. Demand assignment is possible
3. Fixed assignment is possible
4. It is vulnerable to timing problems
a. 1 and 2 are correct
b. 2 and 4 are correct
c. 1, 2 and 3 are correct
d. All four are correct
ANSWER: 1, 2 and 3 are correct
120) FDMA demand assignment uses
1. Single channel per carrier
2. Multi channel per carrier
3. Single transmission in one time slot
4. Multi transmission in one time slot

a. 1 and 2 are correct
b. 2, 3 and 4 are correct
c. 1, 2 and 3 are correct
d. All four are correct
ANSWER: 1 and 2 are correct
121) The advantages of FDMA over TDMA includes
1. Division is simpler
2. Propagation delays are eliminated
3. Cheaper filters with less complicated logic functions
4. Linearity
a. 1, 2 and 3 are correct
b. 1 and 2 are correct
c. 1 and 4 are correct
d. All four are correct
ANSWER: 1 and 2 are correct
122) TDMA is a multiple access technique that has
a. Different users in different time slots
b. Each user is assigned unique frequency slots
c. Each user is assigned a unique code sequence
d. Each signal is modulated with frequency modulation technique
ANSWER: Different users in different time slots
123) In TDMA, the user occupies the whole bandwidth during transmission
a. True
b. False
ANSWER: True
124) TDMA allows the user to have
a. Use of same frequency channel for same time slot
b. Use of same frequency channel for different time slot
c. Use of same time slot for different frequency channel
d. Use of different time slot for different frequency channels
ANSWER: Use of same frequency channel for different time slot
125) GSM is an example of
a. TDMA cellular systems
b. FDMA cellular systems
c. CDMA cellular systems
d. SDMA cellular systems
ANSWER: TDMA cellular systems
126) TDMA is employed with a TDMA frame that has preamble. The preamble contains Address of base station and subscribers

1. Synchronization information
2. Frequency allotted
3. Coded sequence
a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 4 are correct
d. All four are correct
ANSWER: 1 and 2 are correct
127) CDMA is
1. Spread spectrum technology
2. Using same communication medium
3. Every user stays at a certain narrowband channel at a specific time period
4. Each user has unique PN code
a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All four are correct
ANSWER: 1, 2 and 4 are correct
128) Global Positioning System uses
a. CDMA
b. TDMA
c. SDMA
d. FDMA
ANSWER: CDMA
129) CDMA is advantageous over other Spread Spectrum techniques for
1. The privacy due to unique codes
2. It rejects narrow band interference
3. Resistance to multi path fading
4. Its ability to frequency reuse
a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct
130) The wide band usage in CDMA helps in
1. Increased immunity to interference
2. Increased immunity to jamming
3. Multiple user access

4. Different spectrum allocation in different time slots
a. 1, 2 and 3 are correct
b. 2, 3 and 4 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: 1, 2 and 3 are correct
131) The advantages of using a CDMA technique over other spread spectrum techniques are
1. Increased capacity
2. Easier handoff
3. Better measure of security
4. Multiple users occupy different spectrum at a time
a. 1, 2 and 3 are correct
b. 2, 3 and 4 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: 1, 2 and 3 are correct
132) FHMA is
1. Spread spectrum technology
2. Using same communication medium
3. Every user has assigned unique frequency slot
4. Each user has unique PN code
a. 1 and 2 are correct
b. 1, 2 and 4 are correct
c. 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct
133) OFDM is a technique of
1. Encoding digital data
2. Multiple carrier frequencies
3. Wide band digital communication
4. 4G mobile communication
a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct
134) Advantages of using OFDM include

1. Avoids complex equalizers
2. Low symbol rate and guard interval
3. Avoids ISI
4. Multiple users at same frequency
a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct
135) The troubles that OFDM faces over other spread spectrum techniques are
1. Sensitivity to Doppler shift
2. Frequency synchronization problems
3. Time synchronization problems
4. Low efficiency due to guard intervals
a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: 1, 2 and 4 are correct
136) The guard interval is provided in OFDM
a. To eliminate the need of pulse shaping filter
b. To eliminate ISI
c. High symbol rate
d. Both a and b
e. Both b and c
ANSWER: Both a and b
137) Packet radio refers to
a. Multiple users on single channel
b. Single user on multiple channels as per demand
c. Multiple users on multiple channels at different time slots
d. Multiple users with coding techniques
ANSWER: Multiple users on single channel
138) Disadvantages of packet radio are
a. Induced delays
b. Low spectral efficiency
c. Large spectrum required
d. Both a and b
e. Both b and c
ANSWER: Both a and b

139) Pure ALOHA is a
a. Random access protocol
b. Scheduled access protocol
c. Hybrid access protocol
d. Demand access protocol
ANSWER: Random access protocol
140) The increase in number of users in PURE ALOHA causes
a. Increase in delay
b. Increase in probability of collision
c. Increase in spectrum
d. Both a and b
e. Both a and c
ANSWER: Both a and b
141) SDMA technique employs
a. Smart antenna technology
b. Use of spatial locations of mobile units within the cell
c. More battery consumption
d. Both a and b are correct
e. Both b and c are correct
ANSWER: Both a and b are correct
142) The advantage of using SDMA over other spread spectrum technique is
a. Mobile station battery consumption is low
b. Reduced spectral efficiency
c. Increased spectral efficiency
d. Both a and b are correct
e. Both a and c are correct
ANSWER: Both a and c are correct
143) The increased capacity of SDMA is due to
a. Focused signal transmitted into narrow transmission beams
b. Smart antennas pointing towards mobile stations
c. Use of different frequencies at same time slot
d. Both a and b are correct
e. Both a and c are correct
ANSWER: Both a and b are correct
144) Coherence time is
a. Directly proportional to Doppler spread
b. Indirectly proportional to Doppler spread
c. Directly proportional to square of Doppler spread
d. Directly proportional to twice of Doppler spread
ANSWER: Directly proportional to Doppler spread

145) Types of small scale fading, based on Doppler spread are
a. Fast fading
b. Frequency non selective fading
c. Flat fading
d. Frequency selective fading
ANSWER: Fast fading
146) Flat fading or frequency nonselective fading is a type of
a. Multipath delay spread small scale fading
b. Doppler spread small scale fading
c. Both a & b
d. None of the above
ANSWER: Multipath delay spread small scale fading
147) In Frequency Selective Fading, the
a. Coherence Bandwidth of the channel is less than bandwidth of transmitted channel
b. Coherence Bandwidth of the channel is more than bandwidth of transmitted channel
c. Coherence Bandwidth of the channel is equal to bandwidth of transmitted channel
d. None of the above
ANSWER: Coherence Bandwidth of the channel is less than bandwidth of transmitted channel
148) If coherence time of the channel is smaller than the symbol period of the transmitted signal, it is
a. Fast fading
b. Slow fading
c. Frequency selective fading
d. Frequency non selective fading
ANSWER: Fast fading
149) The power delay profile helps in determining
a. Excess delay
b. rms delay spread
c. Excess delay spread
d. All of the above
ANSWER: All of the above
150) Coherence bandwidth is
a. Channel that passes all spectral components with equal gain
b. The bandwidth of modulated signal
c. Channel that passes all spectral components with linear phase
d. Both a and c
e. Both a and b
ANSWER: Both a and c
151) Small scale multipath propagation is caused due to waves with

1. Different propagation delays
2. Different amplitudes
3. Different phase
a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct
152) The effects of small scale multipath propagation are
1. Changes in signal strength
2. Random frequency modulation
3. Time dispersion
a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct
153) Impulse response of a multipath channel is determined by the fact that
a. Mobile radio channel may be modeled as linear filter
b. Impulse response is time varying
c. Both a & b
d. None of the above
ANSWER: Both a & b
154) The received signal from a multipath channel is expressed as
a. Convolution of transmitted signal and impulse response
b. Addition of transmitted signal and impulse response
c. Subtraction of transmitted signal and impulse response
d. All of the above
e. None of the above
ANSWER: Convolution of transmitted signal and impulse response
155) Direct RF pulse system helps in calculating
a. Impulse response in frequency domain
b. Impulse response in phase domain
c. Power delay of the channel
d. All of the above
ANSWER: Power delay of the channel
156) The techniques used for small scale multipath measurements are
1. Direct RF pulse system

2. Spread spectrum sliding correlator channel sounding
3. Frequency domain channel sounding
a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct

JSPM's
Rajarshi Shahu College of Engineering, Tathawade, Pune – 33.
Department of E&TC Engineering
(Academic Year 2020-21, SemVIII)
MCQ Unit-1

Class : BE E &TC (E& TC) Subject: Mobile Communications 404189

1) Which among the following can be adopted as a dedicated path between the source and destination in circuit switching?

a. Physical Wire
b. Radio Link
c. Co-axial Cable
d. All of the above
ANSWER: all of the above

2) In manual switching, which kind of battery exchange has the provision of subscribers set along with magneto generator?

a. Local battery exchange
b. Central battery exchange
c. Both a and b
d. None of the above
ANSWER: (a) local battery exchange

3) Which type of switching network involves the establishment of a dedicated path between two stations?

a. Message Switching
b. Packet Switching
c. Circuit Switching
d. Manual Switching
ANSWER:: (c) circuit switching

4) In message switching system, an incoming message gets ____ especially if the required route is busy.

a. lost
b. stored in a queue & retransmitted
c. sampled
d. recovered
ANSWER:: (B) stored in a queue and retransmitted

5) In packet switching, what does the header of each short size of packet consist of?

a. Source address
b. Destination address
c. Intermediate nodes
d. All of the above
ANSWER:: d all of the above

6) Telephone Traffic is measured in

(A) Seconds.
(B) Hours.
(C) Erlang
(D) Pulses per minute.
ANSWER: c

8) What is the hardware, used to establish connection as an electrical path between inlet and outlet pair in switching system, known as?

a. Switching Matrix
b. Switching Network
c. Both a and b
d. None of the above
ANSWER:: both a and b

9) Busy hour traffic is the
(A) maximum average simultaneous traffic.
(B) traffic during peak hour.
(C) traffic when all subscribers are engaged.
(D) the duration of maximum calls.
Ans: (B)

10) In Electronic Switching Centre (ESC), the transmission rate of X.25 protocol is ____9.6 Kbps.

a. Less than
b. Equal to
c. Greater than
d. None of the above
ANSWER:: c
11) Which kind of switching system does not comprise any subscriber, concentrator or expander?

a. Crossbar
b. Director Exchange
c. Strowger
d. Tandem
ANSWER:: d

13) in ---------- each packet is treated independently of all others
a) circuit switching
b) datagram switching
c) frame switching
d) none of the above
ANSWER:: b
14) which shape of switches are not adopted normally due to non-usability of both way trunks
a) circular
b)triangular
c)hexagonal
d)square
ANSWER:: b

15) the situation when both the transmitter and receiver have to work in tandem is refered as
a) parallel
b)serial
c) synchronous
d) asynchronous

ANSWER:: c

16) the---------- is a circuit switched network, while the ---------- is a packet- switched network
a) telephone, ATM
b) SONET and FDDI
c) satellite, telephone
d) FDDI and SONET
ANSWER:: a

17) When a switch capacity is full, calls coming into that switch are said to be____.
(A) open
(B) shorted
(C) blocked
(D) shunted
ANSWER:: (C)

18) Busy hour traffic is the
(A) maximum average simultaneous traffic.
(B) traffic during peak hour.
(C) traffic when all subscribers are engaged.
(D) the duration of maximum calls.
ANSWER:: (B)

19) Example of circuit switching and S&F (Stored and Forward) switching is
(A) Telephone and Post of Telegraph
(B) Video Signal Post or Telegraph
(C) Digital Signal Post or Telegraph
(D) None of above
Ans: (A)

20)Erlang is used to
(A) Measure busy period
(B) Give total busy period in minutes
(C) Measure average call rate
(D) Indicate total call period
Ans: (A)

21) By which name/s is the Grade of Service (GOS) well-known?
a. Call congestion
b. Time congestion
c. Both a and b
d. None of the above
ANSWER:: a
22) Which form/s of grading design has/have the tendency to share every trunk between equal numbers of groups?
a. Homogeneous Grading
b. Heterogeneous Grading
c. Skipped Grading
d. All of the above
ANSWER:: a
23) In a time multiplexed space switching system, one speech sample appears every
(A) 125 micro sec
(B) 20 msec
(C) 125 msec
(D) 1 sec
ANSWER:: A

24) Time synchronization is necessary in
(A) FDM.
(B) TDM.

(C) WDM.
(D) Quadrature multiplexing
ANSWER:: B

25) The grade of service is measured in
(A) Percentage
(B) Number
(C) Fractional Number
(D) Logarithmic Number
ANSWER:: C
26) The CCITT standard bandwidth for speech is
(A) 20000 Hz
(B) 15000 Hz
(C) 7000 Hz
(D) 3400 Hz
ANSWER:: D
27) In a single stage network
(A) There is no redundancy
(B) There is redundancy
(C) Alternative cross points are available
(D) Alternative paths are available
ANSWER:: (B)
28) The larger the Grade of Service, the worse is the service given
(a) true
(b) false
ANSWER:: a
29) what are the Methods to move data through a network of links and switches
a) Packet switching
b) Circuit switching
c) Line switching
d) Both a and b
ANSWER:: d
30) In _____ resources are allocated on demand.
a) Packet switching
b) circuit switching
c) line switching
d) frequency switching
ANSWER:: a
31) Type of signaling that have same circuit and is used for both signaling and voice communication is called

A. out-band
B. in-band
C. signal transport ports
D. signal points

ANSWER::B
32) Protocol that is used in signaling network is called

A. signal transport ports
B. signaling network
C. Signaling System Seven
D. service control point

ANSWER:: C
33) In Signaling System Seven (SS7), transport layer of OSI model is equivalent to

A. SCCP
B. TUP
C. TCAP
D. ISUP

ANSWER:: A
34) Which among the following exhibit/s the necessity of trunks during the signaling mechanism?

a. Inchannel Signaling
b. Common Channel Signaling
c. Both a and b
d. None of the above
ANSWER:: A
35) If a subscriber needs to provide free connections for other subscribers, it can request the

A. 800 service

B. 900 service

C. wide-area telephone service

D. digital data service

ANSWER:: A
36) Term that refers to switch does not keep information about connection state is

A. connection setup

B. connectionless

C. switchless

D. teardown

ANSWER:: B
37) Three methods of switching are

A. circuit switching, packet switching, and protocol switching

B. circuit switching, packet switching, and message switching

C. Loop switching, packet switching, and message switching

D. Node switching, packet switching, and message switching

ANSWER:: B
38) The situation when both transmitter and receiver have to work in tandem is referred to as
(A) Parallel
(B) Serial
(C) Synchronous
(D) Asynchronous
ANSWER:: C
39) Common channel signaling
(A) Uses the speech or data path for signaling.
(B) Does not use the speech or data path for signaling.
(C) Needs no additional transmission facilities.
(D) Finds it difficult to handle signaling during speech.
ANSWER:: C
40) Which transmission mode is used for data communication along telephone lines?
(A) Parallel
(B) Serial
(C) Synchronous
(D) Asynchronous
ANSWER:: (B)

41]A _____ network network and a datagram of both.
A. virtual-circuit
B. packet-switched
C.frame-switched
D.none of the above

ANSWER: : A

42]In a one-stage space division switch, if N = 200, the number of crosspoints is----------
A. 10,000
B. 20,000
C.40,000
D.30,000
ANSWER::C

43]If 'n' number of users are present in a network with point-to-point links, then how many links will be required in the network?
a. n (n – 1)
b. n (n – 1) / 2
c. n (n – 1) / 4
d. n (n – 1) / 8
ANSWER:: (b) n (n – 1) / 2

44]Which kind of switching technique indicates the transfer of coded values from input to output during the same interval of time?
a. Space Switching
b. Time Switching
c. Combination Switching
d. None of the above
ANSWER:: (a) Space Switching

45]What is the hardware, used to establish connection as an electrical path between inlet and outlet pair in switching system, known as?
a. Switching Matrix
b. Switching Network
c. Both a and b
d. None of the above
ANSWER:: (c) Both a and b

46]In graded groups, switches with inaccessibility to the outgoing route gets ____ into the number of separate groups.
a. added
b. subtracted
c. multiplied
d. divided
ANSWER:: (c) multiplied

47]) Which form/s of grading design has/have the tendency to share every trunk between equal number of groups?
a. Homogeneous Grading
b. Heterogeneous Grading
c. Skipped Grading
d. All of the above
ANSWER:: (a) Homogeneous Grading

48]If the voice channel is free in PSTN, then what would be the maximum data rate supported by 3.1 kHz bandwidth of voice channel?
a. 2000 bps
b. 4000 bps
c. 6000 bps
d. 8000 bps
ANSWER:: (c) 6000 bps

49]In message switching system, an incoming message gets ____ especially if the required route is busy.
a. lost
b. stored in a queue & retransmitted

c. sampled
d. recovered
ANSWER:: (b) stored in a queue & retransmitted

50) Which type of switching network involves the establishment of a dedicated path between two stations?
a. Message Switching
b. Packet Switching
c. Circuit Switching
d. Manual Switching
ANSWER:: (c) Circuit Switching

51) In packet switching, what does the header of each short size of packet consist of?
a. Source address
b. Destination address
c. Intermediate nodes
d. All of the above
ANSWER:: (d) All of the above

52) In manual switching, which kind of battery exchange has the provision of subscribers set along with magneto generator?
a. Local battery exchange
b. Central battery exchange
c. Both a and b
d. None of the above
ANSWER:: (a) Local battery exchange

53]In two-stage network, which phenomenon/situation occurs due to impossible connectivity of given incoming trunk to selected outgoing trunk specifically because of link utilization for other connection between primary and secondary switches?
a. Bursting
b. Blinking
c. Blocking
d. Burning
ANSWER:: (c) Blocking

54) Which kind of switching system does not comprise any subscriber, concentrator or expander?
a. Crossbar
b. Director Exchange
c. Strowger
d. Tandem
ANSWER:: (d) Tandem

55]Which among the following exhibit/s the necessity of trunks during the signaling mechanism?
a. Inchannel Signaling
b. Common Channel Signaling
c. Both a and b
d. None of the above
ANSWER:: (a) Inchannel Signaling

56]Paging systems were based on
a. Simplex systems
b. Half duplex systems
c. Full duplex systems
d. None of the above

ANSWER:: Simplex systems

57) Paging systems could be used to
a. Send numeric messages
b. Send alphanumeric messages
c. Voice message
d. All of the above
ANSWER:: All of the above

58]Carrier frequency of a TV remote control is in the range
a. of Infra red
b. < 100 MHz
c. < 1 GHz
d. < 2 GHz
ANSWER:: of Infra red

59) Half duplex system for communication has
a. Communication in single direction
b. Communication in single direction at a time
c. Communication in both directions at the same time
d. None of the above
ANSWER:: Communication in single direction at a time

60]The 2G cellular network uses
a. TDMA/FDD
b. CDMA/FDD
c. Digital modulation formats
d. All of the above
ANSWER:: All of the above

61]Commonly used mode for 3G networks is
a. TDMA
b. FDMA
c. TDD
d. FDD
ANSWER:: FDD

JSPM's
Rajarshi Shahu College of Engineering, Tathawade, Pune – 33.
Department of E&TC Engineering
(Academic Year 2020-21, SemVIII)

MCQ Unit-2 **Traffic Engineering and Signalling**

Class : BE E &TC (E& TC) Subject: Mobile Communications 404189

1.The ratio of number of successful calls to the number of call attempts is known as
A.Call Completion Rate (CCR)
B.Call Block Rate (CBR)
C.Busy Hour Call Rate (BHCR)
D.None of the above

Answer-A

2.If a telephone exchange serves 1500 users with the average BHCA of about 9000 and CCR is about 50%, what would be the busy hour calling rate?

A.2
B.3
C.4.5
D.5

Answer-B

3.How is the relation between Erlang and CCS specified?
A.1 Erlang = 36 CCS
B.1 Erlang = 56 CCS
C.1 Erlang = 76 CCS
D.1 Erlang = 96 CCS

Answer-A

4.Percentage of occupancy can be defined as the percentage of for which the server seems to be busy.
A.Speed
B.Distance
C.Time
D.Volume

Answer-C

5.By which name/s is the Grade of Service (GOS) well-known?
A.Call congestion
B.Time congestion
C.Both A and B
D.None of the above

Answer-A

6.For the two-group grading consisting of 14 trunks, availability = 5, Ak = 1.4E and the required grade of service of about 0.01, what would be its traffic capacity?

A.4.98 E
B.6.72 E
C.8.3 E
D.10 E

Answer-A

7.Which type of connection takes place between an incoming trunk and an outgoing trunk?
A.Local call
B.Outgoing call
C.Incoming call
D.Transit call

Answer-D

9.In analyzing the traffic performance, how is the number of trunk decided with the provision of the Grade of Service (GoS) especially for larger group?
A.By normal load condition
B.By overload condition
C.By underload condition
D.None of the above

Answer-B

10.If the queuing systems are connected in tandem configuration, what would be the nature of delay?
A.Commutative
B.Distributive
C.Cumulative
D.Deductive

Answer-C

11.Which type of holding time distribution is assumed for the voice conversation on telephone?
A.Constant
B.Exponential
C.Both a and b
D.None of the above

Answer-B

12.Which model of loss system allows the usage of Poisson distribution model for traffic analysis especially by assuming infinite number of users?
A.Lost Calls Cleared (LCC)
B.Lost Calls Returned (LCR)
C.Lost Calls Held (LCH)
D.None of the above

Answer-A

13.Which signals are regarded as call-progress signals as they are sent back to inform the caller about the progress of the call?
A.Address Signals
B.Status Signals
C.Call request Signals
D.Signals

Answer-B

14.Which among the following exhibit/s the necessity of trunks during the signaling mechanism?
A.Inchannel Signaling
B.Common Channel Signaling
C.Both a and b
D. None of the above

Answer-A

15.CCITT abbreviated as
A.Common channel Integrated Time Technique
B.Consultative Committee for International Telephony & Telegraphy
C.Consultative Committee for International Telegraphy & Telephony
D.common channel Integrated Telegraphy & Telephony

Answer-B

16.Protocol used for signaling in the telephone network is called as
A.SS-S
B.SS-7
C.POP
D.ITU

Answer-B

17.In CCS trunks are
A.Required
B.Not Required
C.Busy
D.Free

Answer-B

18.Frequency band used for In- Band signaling is.....
A.300Hz to 3400Hz
B.300KHz to 3400KHz
C.300MHz to 3400MHz
D.30Hz to 340Hz

Answer-A

8.If a group of trunk is offered 1200 calls during the busy hour & 20 calls are lost along with the average call duration of about 7 min, then what would be the total duration of congestion period?
A.21.6 sec
B.42.2 sec
C.57.6 sec
D.98.2 sec

Answer-C

19.TCAP part in SS7 refers to.....layer of OSI
A.Physical
B.Network
C.Data Link
D.Application

Answer-D

20.Which includes in SS7 user part
A.MTP
B.ISUP
C.TCAP
D.OMAP

Answer-A

21.Calculate GOS (B) when N=3 and And B1=0.5 B2=0.05 B3=0.005
A.5.55
B.0.505
C.0.555
D.5.555

Answer-C

22.Holding time is
A.Time require to connect the call
B.Duration of call
C.Time require to allocate trunk
D.All of above

Answer-B

23.Inband signaling uses.....
A.VLF
B.LF
C.VF
D.HF

Answer-C

24.Unit of Telecommunication Traffic is
A.Kilometers
B.Meter/Seconds
C.Erlang
D.Joul

Answer-C

25.What is the value of Probability of delay when system with single server
A.1-A / A
B.A / 1-A
C.1 / 1-A
D.1-A

Answer-B

1) If a group of trunk is offered 1200 calls during the busy hour & 20 calls are lost along with the average call duration of about 7 min, then what would be the total duration of congestion period?

a. 21.6 sec
b. 42.2 sec
c. 57.6 sec
d. 98.2 sec

ANSWER: 57.6 sec

2) Which model of loss system allows the usage of Poisson distribution model for traffic analysis especially by assuming infinite number of users?

a. Lost Calls Cleared (LCC)
b. Lost Calls Returned (LCR)
c. Lost Calls Held (LCH)
d. None of the above

ANSWER: Lost Calls Cleared (LCC)

3) Which type of holding time distribution is assumed for the voice conversation on telephone?

a. Constant
b. Exponential
c. Both a and b
d. None of the above
ANSWER: Exponential

---

4) If the queuing systems are connected in tandem configuration, what would be the nature of delay?

a. Commutative
b. Distributive
c. Cumulative
d. Deductive
ANSWER: Cumulative

---

5) In analyzing the traffic performance, how is the number of trunk decided with the provision of the Grade of Service (GoS) especially for larger group?

a. By normal load condition
b. By overload condition
c. By underload condition
d. None of the above
ANSWER: By overload condition

---

6) By which name/s is the Grade of Service (GOS) well-known?

a. Call congestion
b. Time congestion
c. Both a and b
d. None of the above
ANSWER: Call congestion

---

7) Percentage of occupancy can be defined as the percentage of _____ for which the server seems to be busy.

a. speed
b. distance
c. time
d. volume
ANSWER: time

9) If a telephone exchange serves 1500 users with the average BHCA of about 9000 and CCR is about 50%, what would be the busy hour calling rate?

a. 2
b. 3
c. 4.5
d. 5

ANSWER: 3

---

10) The ratio of number of successful calls to the number of call attempts is known as _____

a. Call Completion Rate (CCR)
b. Call Block Rate (CBR)
c. Busy Hour Call Rate (BHCR)
d. None of the above

ANSWER: Call Completion Rate (CCR)

1. Which of the following is not a service offered by SS7?
a) Touchstar
b) 800 services
c) Alternate billing services
d) 400 services
View Answer
Answer: d
Explanation: There are three main types of services offered by the SS7 network. They are the Touchstar, 800 services, and alternate billing services.
2. Which of the following service is called CLASS?
a) Touchstar
b) 800 services
c) Alternate billing services
d) 400 services
View Answer
Answer: a
Explanation: Touchstar is also known as CLASS. It is a group of switch controlled services that provide its users with certain call management capabilities.
3. Which of the following service of SS& provides call return, call forwarding?
a) Touchstar
b) 800 services
c) Alternate billing services
d) 400 services
View Answer
Answer: a
Explanation: Touchstar is one of the three main type of services offered by SS7. It provides services such as call return, call forwarding, repeat dialling, call block, call tracing and caller ID.
4. Alternating billing service uses CCS network.
a) True
b) False
View Answer
Answer: a
Explanation: Alternate billing service and line information database use the CCS network to enable the calling party to bill a call to a personal number (third party number, calling card, or collect etc.) from any number.
5. SS7 was first developed by _____
a) ITU
b) Ericsson
c) CCITT

d) Motorola
View Answer
Answer: c
Explanation: SS7 is an outgrowth of the out of band signalling first developed by the CCITT under common channel signalling standard, CCS no. 6.
6. Which of the layer of OSI is associated with NSP of SS7?
a) All layers
b) Upper three
c) Lowest three
d) Middle two
View Answer
Answer: c
Explanation: The lowest three layers of the OSI model are handled in SS7 by the network service part (NSP) of the protocol. NSP is made up of three message transfer parts (MTPs) and the signalling connection control part (SCCP) of the SS7 protocol.
7. The function of _____ is to transfer and deliver signalling network.
a) MTP
b) CCS
c) ARDIS
d) CDPD
View Answer
Answer: a
Explanation: The function of the MTP is to ensure that signalling traffic can be transferred and delivered reliably between the end users and the network. MTP is provided at three levels.
8. Signalling data functions are provided by _____
a) MTP level 1
b) MTP level 2
c) MTP level 3
d) TCAP
View Answer
Answer: a
Explanation: Signalling data link functions (MTP level 1) provide an interface to the actual physical channel over which communication takes place. Physical channels may include copper wire, twisted pair, fibre, mobile radio and are transparent to the higher layers.
9. Signalling data functions are provided by _____
a) MTP level 1
b) MTP level 2
c) MTP level 3
d) TCAP
View Answer
Answer: b
Explanation: Signalling data link functions are provided by MTP level 2. They correspond to the second layer in the OSI reference model and provide a reliable link for the transfer of traffic between two directly connected signalling points.
10. _____ provide procedures that transfer messages between signalling nodes.
a) MTP level 1
b) MTP level 2
c) MTP level 3
d) TCAP
View Answer
Answer: c
Explanation: Signalling network functions (MTP level 3) provide procedures that ransfer messages between signalling nodes. As in ISDN, there are two types of MTP level 3 functions: signalling message handling and signalling network management.
11. Which of the following does not include in SS7 user part?
a) MTP
b) ISUP
c) TCAP
d) OMAP
View Answer

Answer: a
Explanation: The SS7 user part includes the ISDN user part (ISUP), the transaction capabilities application part (TCAP) and operations maintenance and administration part (OMAP). The telephone user part (TUP) and the data user part (DUP) are included in the ISUP.
12. The TCAP part in SS7 refers to _____ layer of OSI.
a) Physical
b) Network
c) Data Link
d) Application
View Answer
Answer: d
Explanation: The transaction capabilities application part in SS7 refers to the application layer which invokes the services of the SCCP and the MTP in a hierarchical format. TCAP is concerned with remote operations.

PCM, DPCM, DM, ADPCM are the types of
a. Vocoders
b. Waveform coders
c. Channel allocation for transmission
d. All of the above
ANSWER: Waveform coders
101) Speech coding technique that is independent of the source is
a. Vocoders
b. Waveform coders
c. Both a & b
d. None of the above
ANSWER: Waveform coders
102) Advantage of using waveform coders is
1. Independent of the signal source
2. Less complexity
3. Suitable for noisy environments

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct
103) The type of frequency domain coding that divides the speech signal into sub bands is
a. Waveform coding
b. Vocoders
c. Block transform coding
d. Sub-band coding
ANSWER: Sub-band coding
104) The speech coding technique that is dependent on the prior knowledge of the signal is
a. Waveform coders
b. Vocoders
c. Sub band coding
d. Block transform coding
ANSWER: Vocoders

105) The steps involved in Channel vocoders for speech transmission are
a. Envelope detection, sampling, encoding, multiplexing
b. Sampling, Envelope detection, encoding, multiplexing
c. Envelope detection, encoding, sampling, multiplexing
d. Sampling, Envelope detection, multiplexing, encoding
ANSWER: Envelope detection, sampling, encoding, multiplexing

106) Vocal tract cepstral coefficients and excitation coefficients are separated by
a. Samplers
b. Linear filters

c. Encoders
d. Multiplexers
ANSWER: Linear filters

107) In voice excited vocoders, PCM transmission helps in transmission of
a. High frequency bands of speech
b. Low frequency bands of speech
c. Multiplexed signals
d. Modulated signals
ANSWER: Low frequency bands of speech

JSPM's
Rajarshi Shahu College of Engineering, Tathawade, Pune – 33.
Department of E&TC Engineering
(Academic Year 2020-21, SemVIII)
MCQ Unit-III

Class : BE E &TC (E& TC) Subject: Mobile Communications 404189

1) Which of the following is/are the main part(s) of basic cellular system
A) A mobile Unit
B) A cell Site
C) A mobile Telephone Switching Office
D) All of the above
ANSWER: D

2) State whether True of False
i) The cells or subdivisions of a geographical area are always hexagonal
ii) A land to Mobile call originates through the Telephone exchange
A) True, False
B) False, True
C) False, False
D) True, True
ANSWER: B

3) ..... are typically characterized by very small cells, especially in densely populated areas
A) 2G system.
B) 3G system.
C) 2.5G system.
D) 3.5G system.
ANSWER: C

4) To prevent interference of adjacent cell signals, size of cell is
A) Increased
B) Decreased
C) Optimized
D) Minimized
ANSWER: C

5) Roaming is feature of
A) Cellular Telephony
B) Cellular Data
C) Cellular Frames
D) Cellular Signals
ANSWER: A

6) Area which is divided into small region of cells is called
A) Cellular Service
B) Cellular Data
C) Cellular Signals
D) Cellular Stations
ANSWER: A

7) Mobile Switching Center (MSC) seeks a new cell that can better accommodate communication, if strength of signals are
A) Strong
B) Low

C) Diminishes
D) High

ANSWER: C

8) In cellular telephony, each band is divided into

A) 82 Channels
B) 80 Channels
C) 78 Channels
D) 76 Channels

ANSWER: A

9) In cellular telephony, size of cell is not fixed, increased or decreased depending on population of

A) Signals
B) Area
C) Data
D) Stations

ANSWER: B

10) In cellular telephony, channels 1 to 7 of Interim Standard 95 (IS-95) forward transmission are used for

A) gives information
B) paging
C) traffic control
D) bit synchronization

ANSWER B

11) In cellular telephony, data rate of each reverse voice channel in Interim Standard 95 (IS-95) is

A) 9.2 kbps
B) 9.4 kbps
C) 9.6 kbps
D) 9.8 kbs

ANSWER: C

12) In cellular telephony, Interim Standard 95 (IS-95), forward channel is used technique of

A) CDMA
B) DSSS
C) FHSS
D) FDMA

ANSWER: A

13) In cellular telephony, MSS stands for

A) Multi Stations
B) Moving Stations
C) Mobile Stations
D) Module Stations

ANSWER: C

14) In cellular telephony, Electronic Serial Number (ESN) is unique for each

A) Station
B) Data
C) Mobile
D) Frame

ANSWER: A

15) In cellular telephone network, which component controls the switching between public wireline telephone network and the base station of cells for supporting the different calls between landline to mobile, mobile to landline and mobile to mobile calls?

A) Electronic Switching Center (ESC)
B) A Cell Controller
C) Radio Transmitter & Receiver
D) A common communication protocol

ANSWER: A

16) Which among the following represents the flawless hand-off with no perceivable interruption of service?

A) Hard hand-off
B. Soft hand-off
C. Intracell hand-off
D. Intercell hand-off

ANSWER: B

17) If more number of cells are necessary in the frequency reuse distance, then the segmentation & dualization techniques get _____

A) United
B) divided
C) Restricted
D) filtered

ANSWER: A

18) In cellular telephony, reverse channels of Interim Standard 95 (IS-95) use

A) FDMA
B) FHSS
C) CDMA
D) DSSS

ANSWER: D

19) The interference between the neighboring base stations is avoided by

A) Assigning different group of channels
B) using transmitters with different power level
C) Using different antennas
D) All of the above

ANSWER: A

20) Hexagon shape is used for radio coverage for a cell because

A) It uses the maximum area for coverage
B) Fewer number of cells are required
C) It approximates circular radiation pattern
D) All of the above

ANSWER: D

21) If the system is designed with the usage of hexagonal-shaped cells, how are the base-stations located?
a. At the centre of cell
b. At the edge of cell
c. At the corner of the cell
d. All of the above
ANSWER: (d) All of the above

22) Which antennas are used at the center of the cells for the system with hexagonal-shaped cells?
a. Omni-directional antennas
b. Sectored directional antennas
c. Both a and b
d. None of the above
ANSWER: (a) Omni-directional antennas

23) In a cellular telephone system, which type of interference results from imperfect design of filters in receivers by allowing nearby frequencies to enter the receiver?
a. Co-channel Interference
b. Adjacent-channel Interference
c. Both a and b
d. None of the above
ANSWER: (b) Adjacent-channel Interference

24) Which effect is widespread in adjacent-channel interference especially after the reception of a weak signal by a mobile user from the base-station?
a. Near-far effect
b. Doppler’s effect
c. Capture effect
d. Kendall effect
ANSWER: (a) Near-far effect

25) Which method of cellular network assists in minimizing the co-channel interference associated with the angle of degree?
a. Cell Splitting
b. Cell Sectoring
c. Cell Segmentation & Dualization
d. None of the above

ANSWER: (b) Cell Sectoring
26) Which type of connection takes place between an incoming trunk and an outgoing trunk?
a. Local call
b. Outgoing call
c. Incoming call
d. Transit call
ANSWER: (d) Transit call

27]Which among the following represents the flawless hand-off with no perceivable interruption of service?
a. Hard hand-off
b. Soft hand-off
c. Intracell hand-off
d. Intercell hand-off
ANSWER: (b) Soft hand-off

28] In cellular telephone network, which component controls the switching between public wireline telephone network and the base station of cells for supporting the different calls between landline to mobile, mobile to landline and mobile to mobile calls?
a. Electronic Switching Center (ESC)
b. A Cell Controller
c. Radio Transmitter & Receiver
d. A common communication protocol
ANSWER: (a) Electronic Switching Center (ESC)
29) In Electronic Switching Centre (ESC), the transmission rate of X.25 protocol is ____9.6 Kbps.
a. Less than
b. Equal to
c. Greater than
d. None of the above
ANSWER: (c) Greater than

30]MIN stands for
a. Mobile Identification Number
b. Mobile Internet
c. Mobility In Network
d. None of the above
ANSWER: Mobile Identification Number
31) The process of transferring a mobile station from one base station to another is
a. MSC
b. Roamer
c. Hand off
d. Forward channel
ANSWER: Hand off

32]The interference between the neighboring base stations is avoided by
a. Assigning different group of channels
b. Using transmitters with different power level
c. Using different antennas
d. All of the above
ANSWER: Assigning different group of channels

33]Radio capacity may be increased in cellular concept by
a. Increase in radio spectrum
b. Increasing the number of base stations & reusing the channels
c. Both a & b
d. None of the above

ANSWER: Increasing the number of base stations & reusing the channels

34]The shape of the cellular region for maximum radio coverage is
a. Circular
b. Square
c. Oval
d. Hexagon
ANSWER: Hexagon

35) Hexagon shape is used for radio coverage for a cell because
a. It uses the maximum area for coverage
b. Fewer number of cells are required
c. It approximates circular radiation pattern
d. All of the above
ANSWER: All of the above
36) Centre excited hexagonal cells use
a. Sectored directional antennas
b. Omni directional antennas
c. Yagi uda antennas
d. None of the above
ANSWER: Omni directional antennas
37) Spectrum Efficiency of a cellular network is
a. The traffic carried by whole network
b. The traffic carried per cell divided by the bandwidth of the system and the area of a cell
c. Expressed in Erlang /MHz /km^2
d. Both b and c
e. Both a and c
ANSWER: Both b and c
38) The advantage of using frequency reuse is
a. Increased capacity
b. Limited spectrum is required
c. Same spectrum may be allocated to other network
d. All of the above
ANSWER: All of the above
39) The strategies acquired for channel assignment are
a. Fixed
b. Dynamic
c. Regular
d. Both a and b
e. Both b and c
ANSWER: Both a and b
40) In a fixed channel assignment strategy, if all the assigned channels are occupied, the call
a. Gets transferred to another cell
b. Gets blocked
c. Is kept on waiting
d. All of the above
ANSWER: Gets blocked
41) In a fixed channel assignment strategy
a. Each cell is assigned a predetermined set of frequencies
b. The call is served by unused channels of the cell
c. The call gets blocked if all the channels of the cell are occupied
d. All of the above
ANSWER: All of the above
42) In a dynamic channel assignment strategy,
a. Voice channels are not permanently assigned
b. The serving base station requests for a channel from MSC
c. MSC allocates the channel according to the predetermined algorithm
d. All of the above
ANSWER: All of the above

43) Advantage of using Dynamic channel assignment is
a. Blocking is reduced
b. Capacity of the system is increased
c. Both a & b
d. None of the above
ANSWER: Both a & b
44) Disadvantage of using Dynamic channel assignment is
a. More storage required
b. Calculations and analysis is increased
c. Both a & b
d. None of the above
ANSWER: Both a & b
45) In Dynamic channel assignment, any channel which is being used in one cell can be reassigned simultaneously to another cell in the system at a reasonable distance.
a. True
b. False
ANSWER: True
46) In Handoff
a. Process of transferring the call to the new base station
b. Transfers the call
c. New channel allocation is done
d. All of the above
ANSWER: All of the above
47) Delay in handoffs is caused due to
a. Week signal conditions
b. High traffic conditions
c. Un availability of the channel
d. All of the above
ANSWER: All of the above

48].While handoffs, the termination of call may be avoided by
a. Providing Guard channel
b. Queuing of handoffs
c. Both a & b
d. None of the above
ANSWER: Both a & b

49] Dwell time is the time for
a. A call within the cell
b. Hand off
c. Waiting for channel allocation
d. None of the above
ANSWER: A call within the cell

50) Dwell time depends upon
a. Interference
b. Distance between the subscriber and the base station
c. Propagation of call
d. All of the above
ANSWER: All of the above

51) In Mobile Assisted Handoff (MAHO), the handoff takes place when
a. The power received by the mobile station from other base station is more than the serving base station
b. The channel allocated is not available
c. The mobile station has no signal
d. All of the above

ANSWER: The power received by the mobile station from other base station is more than the serving base station

52) Mobile Assisted Handoff (MAHO) provides
a. Faster handoffs
b. Suitability for frequent handoffs
c. MSC need not monitor the signal strength
d. All of the above
ANSWER: All of the above

53) Trunking in a cellular network refers to
a. Termination of a call
b. Spectrum unavailability
c. Accommodating large number of users in limited spectrum
d. All of the above
ANSWER: Accommodating large number of users in limited spectrum

54) When all of the radio channels are in use in a trunking system
a. The user is blocked
b. The access to the system is denied
c. The queue may be provided
d. All of the above
ANSWER: All of the above

55) Umbrella cell approach
a. Uses large and small cells
b. Uses different antenna heights
c. Is used for high speed users with large coverage area and low speed users with small coverage area
d. All of the above
ANSWER: All of the above

56) Interference in cellular systems is caused by
a. Two base stations operating in same frequency band
b. Two calls in progress in nearby mobile stations
c. Leakage of energy signals by non cellular systems into cellular frequency band
d. All of the above
ANSWER: All of the above
52) Interference in frequency bands may lead to
a. Cross talk
b. Missed calls
c. Blocked calls
d. All of the above
ANSWER: All of the above

57) Co-channel reuse ratio depends upon
a. Radius of the cell
b. Distance between the centers of the co channel cells
c. Frequency allocation of nearest cells
d. Both a and b
e. Both b and c
ANSWER: Both a and b

58) Increase in Co- channel reuse ratio indicates
a. Better transmission quality
b. Larger capacity
c. Low co-channel interference
d. Both a and c
e. Both a and b

ANSWER: Both a and c

59] Grade of service refers to
a. Accommodating large number of users in limited spectrum
b. Ability of a user to access trunked system during busy hour
c. Two calls in progress in nearby mobile stations
d. High speed users with large coverage area
ANSWER: Ability of a user to access trunked system during busy hour

60) Traffic intensity is expressed in
a. Erlangs /MHz /km^2
b. Erlangs
c. λ/ sec
d. dB/sec
ANSWER: Erlangs

61) The techniques used to improve the capacity of cellular systems are
a. Splitting
b. Sectoring
c. Coverage zone approach
d. All of the above
ANSWER: All of the above

62) Distributed antenna systems are used at
a. Transmitters of mobile systems
b. Transmitters of base stations
c. Inputs and outputs of repeaters
d. Receivers of mobile stations
ANSWER: Inputs and outputs of repeaters

63) Antenna down tilting refers to
a. Focusing radio energy towards ground
b. Decreasing the strength of antenna
c. Decreasing the S/N ratio at the antenna input
d. All of the above
ANSWER: Focusing radio energy towards ground

64) Diffraction, at high frequencies, depends upon
1. Geometry of the object
2. Polarization of the incident wave
3. Amplitude of the incident wave
4. Frequency of the incident wave

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 1, 2 and 3 are correct

65) The rainbow pattern seen on a CD is an example of
a. Reflection
b. Refraction
c. Diffraction
d. None of the above
ANSWER: Diffraction

66) Fresnel Reflection Coefficient is a factor of 1. Polarization of the wave
2. Properties of the material at which reflection occurs 3. Angle of incidence of wave

a. 1 and 2 are correct
b. 1 and 3 are correct
c. All the three are correct
d. 2 and 3 are correct
ANSWER: All the three are correct

67) When a wave falls on a perfect conductor
a. Wave is partially reflected and partially transmitted
b. All incident energy is reflected back without loss of energy
c. Part of energy gets absorbed
d. Both a and c
ANSWER: All incident energy is reflected back without loss of energy

68) Brewster angle is the angle at which
a. No reflection occurs at the first medium
b. Reflection coefficient is zero
c. The wave gets refracted in the direction of source
d. Both a and b
e. Both a and c
ANSWER: Both a and b

69) Fading is caused due to
1. Multi path propagation
2. Obstacles
3. Frequency variations at the source
4. Variation in amplitude and phase at receiver

a. 1 and 2 are correct
b. 1, 2 and 4 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 1, 2 and 4 are correct

70) Coherence time refers to
a. Time required to attain a call with the busy base station
b. Time required for synchronization between the transmitter and the receiver
c. Minimum time for change in magnitude and phase of the channel
d. None of the above
ANSWER: Minimum time for change in magnitude and phase of the channel

71) Fading due to shadowing is
a. Fading due to large obstructions
b. Large coherence time of the channel as compared to the delay constraints
c. Small coherence time of the channel as compared to the delay constraints
d. Both a and b
e. Both a and c
ANSWER: Both a and b

72) Deep fade is
1. Strong destructive interference
2. Drop in signal to noise ratio
3. Temporary failure of message transfer

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: All are correct

73) Doppler spread refers to
a. Signal fading due to Doppler shift in the channel
b. Temporary failure of message transfer
c. Large coherence time of the channel as compared to the delay constraints
d. All of the above
ANSWER: Signal fading due to Doppler shift in the channel

74) Friis free space equation
1. Is an expression for noise power
2. Is a function of transmitting and receiving antenna gain
3. Depends upon the distance between transmitting and receiving antenna

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 2 and 3 are correct

75) The free space model of propagation refers to
1. Unobstructed line of sight between the transmitter and receiver
2. Satellite communication systems and Microwave line of sight radio links
3. Propagation along the ground surface

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: 1 and 2 are correct

76) According to Friis free space equation
1. Received power falls with square of the distance between the transmitter and receiver
2. Increases with square of the distance between the transmitter and receiver
3. Received power increases with gains of transmitting and receiving antennas

a. 1 and 2 are correct
b. 1 and 3 are correct
c. All the three are correct
d. 2 and 3 are correct
ANSWER: All the three are correct
77) EIRP is
1. Effective Isotropic Radiated Power
2. Maximum radiated power available by the transmitter
3. A factor of power and gain of transmitter

a. 1 and 2 are correct
b. 1 and 3 are correct
c. All the three are correct
d. 2 and 3 are correct
ANSWER: All the three are correct

78]Fast hopping is
a. More than one frequency hop during each symbol
b. Hopping rate greater than or equal to information symbol rate
c. One or more symbols transmitted between frequency hops
d. Both a and b
e. Both b and c
ANSWER: Both a and b

79) Slow frequency hopping refers to
a. One or more symbols transmitted in time interval between frequency hops
b. More than one frequency hop during each symbol
c. Hopping rate greater than or equal to information symbol rate
d. Both a and c are correct
ANSWER: One or more symbols transmitted in time interval between frequency hops

80]Guard band is
a. The small unused bandwidth between the frequency channels to avoid interference
b. The bandwidth allotted to the signal
c. The channel spectrum
d. The spectrum acquired by the noise between the signal
ANSWER: The small unused bandwidth between the frequency channels to avoid interference

81) Cable television is an example of
a. TDMA
b. FDMA
c. CDMA
d. SDMA
ANSWER: FDMA

82) In FDMA,
1. Each user is assigned unique frequency slots
2. Demand assignment is possible
3. Fixed assignment is possible
4. It is vulnerable to timing problems

a. 1 and 2 are correct
b. 2 and 4 are correct
c. 1, 2 and 3 are correct
d. All four are correct
ANSWER: 1, 2 and 3 are correct

83) FDMA demand assignment uses
1. Single channel per carrier
2. Multi channel per carrier
3. Single transmission in one time slot
4. Multi transmission in one time slot

a. 1 and 2 are correct
b. 2, 3 and 4 are correct
c. 1, 2 and 3 are correct
d. All four are correct
ANSWER: 1 and 2 are correct
84) The advantages of FDMA over TDMA includes
1. Division is simpler
2. Propagation delays are eliminated
3. Cheaper filters with less complicated logic functions
4. Linearity

a. 1, 2 and 3 are correct
b. 1 and 2 are correct
c. 1 and 4 are correct
d. All four are correct
ANSWER: 1 and 2 are correct

85) TDMA is a multiple access technique that has
a. Different users in different time slots
b. Each user is assigned unique frequency slots
c. Each user is assigned a unique code sequence
d. Each signal is modulated with frequency modulation technique
ANSWER: Different users in different time slots

86) In TDMA, the user occupies the whole bandwidth during transmission
a. True
b. False
ANSWER: True

87) TDMA allows the user to have
a. Use of same frequency channel for same time slot
b. Use of same frequency channel for different time slot
c. Use of same time slot for different frequency channel
d. Use of different time slot for different frequency channels
ANSWER: Use of same frequency channel for different time slot

88) GSM is an example of
a. TDMA cellular systems
b. FDMA cellular systems
c. CDMA cellular systems
d. SDMA cellular systems
ANSWER: TDMA cellular systems

89) TDMA is employed with a TDMA frame that has preamble. The preamble contains Address of base station and subscribers
1. Synchronization information
2. Frequency allotted
3. Coded sequence

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 4 are correct
d. All four are correct
ANSWER: 1 and 2 are correct

90) CDMA is
1. Spread spectrum technology
2. Using same communication medium
3. Every user stays at a certain narrowband channel at a specific time period
4. Each user has unique PN code

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All four are correct
ANSWER: 1, 2 and 4 are correct

91) Global Positioning System uses
a. CDMA
b. TDMA
c. SDMA
d. FDMA
ANSWER: CDMA

92) CDMA is advantageous over other Spread Spectrum techniques for

1. The privacy due to unique codes
2. It rejects narrow band interference
3. Resistance to multi path fading
4. Its ability to frequency reuse

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct

93) The wide band usage in CDMA helps in
1. Increased immunity to interference
2. Increased immunity to jamming
3. Multiple user access
4. Different spectrum allocation in different time slots

a. 1, 2 and 3 are correct
b. 2, 3 and 4 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: 1, 2 and 3 are correct

94) The advantages of using a CDMA technique over other spread spectrum techniques are
1. Increased capacity
2. Easier handoff
3. Better measure of security
4. Multiple users occupy different spectrum at a time

a. 1, 2 and 3 are correct
b. 2, 3 and 4 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: 1, 2 and 3 are correct

95) FHMA is
1. Spread spectrum technology
2. Using same communication medium
3. Every user has assigned unique frequency slot
4. Each user has unique PN code

a. 1 and 2 are correct
b. 1, 2 and 4 are correct
c. 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct
96) OFDM is a technique of
1. Encoding digital data
2. Multiple carrier frequencies
3. Wide band digital communication
4. 4G mobile communication

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct

97) Advantages of using OFDM include

1. Avoids complex equalizers
2. Low symbol rate and guard interval
3. Avoids ISI
4. Multiple users at same frequency

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct

98) The troubles that OFDM faces over other spread spectrum techniques are
1. Sensitivity to Doppler shift
2. Frequency synchronization problems
3. Time synchronization problems
4. Low efficiency due to guard intervals

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: 1, 2 and 4 are correct

99]Types of small scale fading, based on Doppler spread are
a. Fast fading
b. Frequency non selective fading
c. Flat fading
d. Frequency selective fading
ANSWER: Fast fading
100) Flat fading or frequency nonselective fading is a type of
a. Multipath delay spread small scale fading
b. Doppler spread small scale fading
c. Both a & b
d. None of the above
ANSWER: Multipath delay spread small scale fading

101) In Frequency Selective Fading, the
a. Coherence Bandwidth of the channel is less than bandwidth of transmitted channel
b. Coherence Bandwidth of the channel is more than bandwidth of transmitted channel
c. Coherence Bandwidth of the channel is equal to bandwidth of transmitted channel
d. None of the above
ANSWER: Coherence Bandwidth of the channel is less than bandwidth of transmitted channel

102) If coherence time of the channel is smaller than the symbol period of the transmitted signal, it is
a. Fast fading
b. Slow fading
c. Frequency selective fading
d. Frequency non selective fading
ANSWER: Fast fading

103]Coherence bandwidth is
a. Channel that passes all spectral components with equal gain
b. The bandwidth of modulated signal
c. Channel that passes all spectral components with linear phase
d. Both a and c
e. Both a and b
ANSWER: Both a and c

104) Small scale multipath propagation is caused due to waves with
1. Different propagation delays
2. Different amplitudes
3. Different phase

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct

104) The effects of small scale multipath propagation are
1. Changes in signal strength
2. Random frequency modulation
3. Time dispersion

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct

105) Impulse response of a multipath channel is determined by the fact that
a. Mobile radio channel may be modeled as linear filter
b. Impulse response is time varying
c. Both a & b
d. None of the above
ANSWER: Both a & b

106) The received signal from a multipath channel is expressed as
a. Convolution of transmitted signal and impulse response
b. Addition of transmitted signal and impulse response
c. Subtraction of transmitted signal and impulse response
d. All of the above
e. None of the above
ANSWER: Convolution of transmitted signal and impulse response

107) Direct RF pulse system helps in calculating
a. Impulse response in frequency domain
b. Impulse response in phase domain
c. Power delay of the channel
d. All of the above
ANSWER: Power delay of the channel

108) The techniques used for small scale multipath measurements are
1. Direct RF pulse system
2. Spread spectrum sliding correlator channel sounding
3. Frequency domain channel sounding

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. All the three are correct
ANSWER: All the three are correct

Unit IV - GSM Fundamentals

1. Which of the following is the world's first cellular system to specify digital modulation and network level architecture?
a) GSM
b) AMPS
c) CDMA
d) IS-54
View Answer
Answer: a
Explanation: GSM was the world's first cellular system to specify digital modulation and level architectures and services. It is the world's most popular 2G technology. It was developed to solve the fragmentation problems of the first cellular systems in Europe.
2. Previously in 1980s, GSM stands for _____
a) Global system for mobile
b) Groupe special mobile
c) Global special mobile
d) Groupe system mobile
View Answer
Answer: b
Explanation: In the mid-1980s GSM was called by the name Groupe special mobile. In 1992, GSM changed its name to Global System for Mobile Communication for marketing reasons.
3. Who sets the standards of GSM?
a) ITU
b) AT & T
c) ETSI
d) USDC
View Answer
Answer: c
Explanation: The setting of standards for GSM is under the aegis of the European Technical Standards Institute (ETSI). GSM task was to specify a common mobile communication system for Europe in the 900 MHZ band.
4. Which of the following does not come under the teleservices of GSM?
a) Standard mobile telephony
b) Mobile originated traffic
c) Base originated traffic
d) Packet switched traffic
View Answer
Answer: d
Explanation: GSM services follow ISDN guidelines and are classified as either teleservices or data services. Teleservices include standard mobile telephony and mobile originated or base originated traffic.
5. Which of the following comes under supplementary ISDN services?
a) Emergency calling
b) Packet switched protocols
c) Call diversion
d) Standard mobile telephony
View Answer
Answer: c
Explanation: Supplementary ISDN services are digital in nature. They include call diversion, closed user groups, and caller identification, and are not available in analog mobile networks. Supplementary services also include short messaging service (SMS).

6. Which of the following memory device stores information such as subscriber's identification number in GSM?
a) Register
b) Flip flop
c) SIM
d) SMS
View Answer
Answer: c
Explanation: SIM (subscriber identity module) is a memory device that stores information such as the subscriber's identification number, the networks and countries where the subscriber is entitled to service, privacy keys, and other user specific information.
7. Which of the following feature makes impossible to eavesdrop on GSM radio transmission?
a) SIM
b) On the air privacy
c) SMS
d) Packet switched traffic
View Answer
Answer: b
Explanation: The on the air privacy feature of GSM makes impossible to eavesdrop on a GSM radio transmission. The privacy is made possible by encrypting the digital bit stream sent by a GSM transmitter, according to a specific secret cryptographic key that is known only to the cellular carrier.
8. Which of the following does not come under subsystem of GSM architecture?
a) BSS
b) NSS
c) OSS
d) Channel
View Answer
Answer: d
Explanation: The GSM architecture consists of three major interconnected subsystems that interact between themselves and with the users through certain network interfaces. The subsystems are BSS (Base Station Subsystem), NSS (Network and Switching Subsystem) and OSS (Operation Support Subsystem).
9. Which of the following subsystem provides radio transmission between mobile station and MSC?
a) BSS
b) NSS
c) OSS
d) BSC
View Answer
Answer: a
Explanation: The BSS provides and manages radio transmission paths between the mobile stations and the Mobile Switching Center (MSC). It also manages the radio interface between the mobile stations and all other subsystems of GSM.
10. _____ manages the switching function in GSM.
a) BSS
b) NSS
c) OSS

d) MSC
View Answer
Answer: b
Explanation: NSS (Network and Switching Subsystem) manages the switching functions of the system. It allows the MSCs to communicate with other networks such as PSTN and ISDN.
11. _____ supports the operation and maintenance of GSM.
a) BSS
b) NSS
c) OSS
d) MSC
View Answer
Answer: c
Explanation: The OSS (Operation Support Subsystem) supports the operation and maintenance of GSM. It allows system engineers to monitor, diagnose, and troubleshoot all aspects of GSM.

SET 1 of GSM fundamentals mcqs

1. How much is uplink frequency for GSM-900?
a. 935-960MHz
b. 890-915MHz
c. 1710-1785MHz
d. 1805-1880MHz

Ans - B

2. B.W of DCS-1800 is
a. 25MHz
b. 50MHz
c. 75MHz
d. 100MHz

Ans - C

3. Mobile Terminal is combination of
a. Hardware & Software
b. More than one Softwares
c. 2 Hardware Kits
d. None of above

Ans - A

4. Size of ID-1 GSM SIM card is
a. Postcard size
b. Credit Card size
c. Passport Size
d. Normal SIM card size

Ans - B

5. How much digits in IMSI Structure?
a. Three Digits
b. Ten Digits
c. Fifteen Digits
d. two or three Digits

Ans - C

6. Abis Interface provides interface between
a. BTS & BSC
b. MS & BTS
c. BTS & MSC
d. BSC & MSC

Ans - A

7. Protocol used in E Interface is
a. MAP/F
b. MAP/D & MAP/E
c. MAP/E & MAP/F
d. MAP/E

Ans - D

8. Which Modulation techniques is used in GSM-900 ?
a. QPSK
b. 0.8 GMSK
c. 0.3 GMSK
d. 4-Ary MSK

Ans - C

9. Who set the standard of GSM?
a. ITU
b. AT & T
c. ETSI
d. USDC

Ans - C

10. Which of the following does not come under subsystem of GSM architecture?
a. BSS
b. NSS
c. OSS
d. Channel

Ans - D

SET 2 of GSM fundamentals mcqs

11. Which of the following subsystem provides radio transmission between mobile station and MSC ?
a. BSS
b. NSS
c. OSS
d. BSC

Ans - A

12. Manages switching function in GSM
a. BSS
b. NSS
c. OSS
d. MSC

Ans - B

13. Which interface is used between MSC to VLR ?
a. B-Interface
b. D-Interface
c. C-Interface
d. F-Interface

Ans - A

14. Which interface is used to support SMS service?
a. B-Interface
b. H-Interface
c. C-Interface
d. F-Interface

Ans - B

15. Maximum digits in TMSI are
a. 8
b. 16
c. 24
d. 32

Ans - D

16. is assigned by mobile equipment manufacturer for its unique identification.
a. TMSI
b. IMEI
c. IMSI
d. SIM

Ans - B

17. Maximum BS power of DCS- 1800 is
a. 55dBm
b. 43dBm
c. 55dBw
d. 43dBw

Ans - B

18. Which layer is based on ISDN LAPD protocol
a. LAPDm Layer
b. Network Layer
c. Physical Layer
d. All of above

Ans - A

19. RR is sub layer of
a. LAPDm Layer
b. Network Layer
c. Physical Layer
d. All of above

Ans - B

20. Modulation Data rate of GSM 900 is
a. 270.83Mbps
b. 270.83Kbps
c. 13.4 Kbps
d. 13.4Mbps

Ans - B

21. What are the main parts of a mobile station in a GSM Network?
a. Mobile Terminal (MT)
b. Subscriber Identify Module (SIM)
c. Both A & B
d. None of above

Ans - C

22. What are the main parts of a NSS of a GSM architecture?
a. MSC
b. HLR & Auc
c. VLR & EIR
d. All of above

Ans - D
23. BTS is also called generally
a. Mobile Tower Exchange

b. Charging Point
c. None of Above

Ans - A

24. IMEI Stands for
a. Internal Mobile Equipment Identify
b. International Mobile Equipment Identity
c. Intra Mobile Enable Identity
d. None

Ans - B

25. Your mobile number is actually called _____ number
a. IMSI
b. SIM
c. MSISDN
d. None

Ans - C

Which is one of the disadvantages of 2G standards?
a) Short Messaging Service (SMS)
b) Digital modulation
c) Limited capacity
d) Limited Internet Browsing
View Answer
Answer: d
Explanation: 2G technologies use circuit switched data modems that limits data users to a single circuit switched voice channel. The advantages of 2G network are that they are digital in nature and supports SMS service.
The 2G GSM technology uses a carrier separation of _____
a) 1.25 MHz
b) 200 KHz
c) 30 KHz
d) 300 KHz
View Answer
Answer: b
Explanation: The Global System for Mobile (GSM) uses a carrier separation of 200 KHz, each channel supporting upto eight users.
S-95 uses which modulation technique?
a) GMSK
b) BPSK
c) QAM
d) AFSK
View Answer
Answer: b
Explanation: IS- 95 uses BPSK (Binary Phase Shift Keying) with quadrature spreading. It is regarded as one of the most robust digital modulation technique and is used for long distance wireless communication.

Which modulation technique is used by GSM?
a) GMSK
b) BPSK
c) QPSK
d) GFSK
View Answer
Answer: a
Explanation: GSM uses a form of modulation known as GMSK (Gaussian Minimum Shift Keying). It is a form of modulation with no phase discontinuities and provides data transmission with efficient spectrum usage.
9. IS-95 uses which modulation technique?

How many users or voice channels are supported for each 200 KHz channel in GSM?
a) Eight
b) Three
c) Sixty four
d) Twelve
View Answer
Answer: a
Explanation: GSM is a circuit switched system that divides each 200 KHz channel into eight 25 KHz time slots, i.e. each radio channel is divided into eight voice channels.
Which of the following multiple access techniques are used by second generation cellular systems?
a) FDMA/FDD and TDMA/FDD
b) TDMA/FDD and CDMA/FDD
c) FDMA/FDD and CDMA/FDD
d) FDMA/FDD only
View Answer
Answer: b
Explanation: First generation cellular system used FDMA/FDD techniques. Second generation standards uses TDMA/FDD and CDMA/FDD multiple access techniques. 2G networks are digital.

Unit-5 GSM Channels and Services

1. TDMA systems transmit in a continuous way.
a) True
b) False
View Answer
Answer: b
Explanation: TDMA systems transmit data in a buffer and burst method. Thus, the transmission for any user is not continuous.
2. Preamble contains _____
a) Address
b) Data
c) Guard bits
d) Trail bits
View Answer

Answer: a
Explanation: TDMA frame is made up of a preamble, an information message and the trail bits. In a TDMA frame, the preamble contains the address and synchronization information that both the base station and the subscribers use to identify each other.
3. _____ are utilized to allow synchronization of the receivers between different slots and frames.
a) Preamble
b) Data
c) Guard bits
d) Trail bits
View Answer
Answer: c
Explanation: Guard times are utilized to allow synchronization of the receivers between different slots and frames. TDMA/FDD systems intentionally induce several time slots of delay between the forward and reverse time slots for a particular user.
4. Which of the following is not true for TDMA?
a) Single carrier frequency for single user
b) Discontinuous data transmission
c) No requirement of duplexers
d) High transmission rates
View Answer
Answer: a
Explanation: TDMA share a single carrier frequency with several users, where each user makes use of non-overlapping time slots. The number of time slots per frame depends on several factors, such as modulation technique, available bandwidth etc.
5. Because of _____ transmissions in TDMA, the handoff process in _____
a) Continuous, complex
b) Continuous, simple
c) Discontinuous, complex
d) Discontinuous, simple
View Answer
Answer: d
Explanation: Because of discontinuous transmissions in TDMA, the handoff process is much simpler for a subscriber unit, since it is able to listen for other base stations during idle time slots.
6. _____ synchronization overhead is required in TDMA due to _____ transmission.
a) High, burst
b) High, continuous
c) Low, burst
d) No, burst
View Answer
Answer: a
Explanation: High synchronization overhead is required in TDMA systems because of burst transmissions. TDMA transmissions are slotted, and this requires the receivers to be synchronized for each data burst.
7. TDMA allocates a single time per frame to different users.
a) True
b) False
View Answer

8. _____ of TDMA system is a measure of the percentage of transmitted data that contains information as opposed to providing overhead for the access scheme.
a) Efficiency
b) Figure of merit
c) Signal to noise ratio
d) Mean
View Answer
Answer: a
Explanation: Efficiency of TDMA system is a measure of the percentage of transmitted data that contains information as opposed to providing overhead for the access scheme. The frame efficiency is the percentage of bits per frame which contain transmitted data.
9. A TDMA system uses 25 MHz for the forward link, which is broken into radio channels of 200 kHz. If 8 speech channels are supported on a single radio channel, how many simultaneous users can be accommodated?
a) 25
b) 200
c) 1600
d) 1000
View Answer
Answer: d
Explanation: For a TDMA system that uses 25 MHz for the forward link, which is broken into radio channels of 200 kHz. If 8 speech channels are supported on a single radio channel, 1000 simultaneous users can be accommodated as N = (25 MHz)/(200 kHz/8).
10. What is the time duration of a bit if data is transmitted at 270.833 kbps in the channel?
a) 270.833 s
b) 3 μs
c) 3.692 μs
d) 3.692 s
View Answer
Answer: c
Explanation: If data is transmitted at 270.833 kbps in the channel, the time duration of a bit will be 3.692 μs, as T_b = (1/270.833 kbps) = 3.692 μs.
1. What is the condition for handoff?
a) A mobile moves into a different cell while in conversation
b) A mobile remains in the same cell while in conversation
c) A mobile moves to different cell when idle
d) A mobile remains in the same cell and is idle
View Answer
Answer: a
Explanation: Handoff occurs when a mobile moves into a different cell while a conversation is in progress. The MSC automatically transfers the call to a new channel belonging to the new base station.
2. Handoff does not require voice and control channel to be allocated to channels associated with the new base station.
a) True
b) False
View Answer
Answer: b
Explanation: Handoff operation involves identifying a new base station. It also requires that the voice and control signal be allocated to channels associated with the new base station.

3. The time over which a call can be maintained within a cell without handoff is called _____
a) Run time
b) Peak time
c) Dwell time
d) Cell time
View Answer
Answer: c
Explanation: The time over which a call is maintained within a cell without handoff is called as dwell time. Dwell time vary depending on speed of user and type of radio coverage.
4. Dwell time does not depend on which of the following factor?
a) Propagation
b) Interference
c) Distance between subscriber and base station
d) Mobile station
View Answer
Answer: d
Explanation: Dwell time of a particular user is governed by a number of factors. They include propagation, interference, distance between the subscriber and the base station, and other time varying effects.
5. Which of the following is associated with the handoff in first generation analog cellular systems?
a) Locator receiver
b) MAHO
c) Cell dragging
d) Breathing cell
View Answer
Answer: a
Explanation: Locator receiver is a spare receiver in each base station. It is used to scan and determine signal strengths of mobile users which are in neighbouring cells.

6. MAHO stands for _____
a) MSC assisted handoff
b) Mobile assisted handoff
c) Machine assisted handoff
d) Man assisted handoff
View Answer
Answer: b
Explanation: MAHO stands for mobile assisted handoff. In 2G systems, handoff decisions are mobile assisted. In MAHO, every mobile station measure the received power from surrounding base station and continuously reports the results to serving base station.
7. A handoff is initiated when the power received from the base station of a neighbouring cell falls behind the power received from the current base station by certain level.
a) True
b) False
View Answer
Answer: b
Explanation: MAHO measures the power received from the surrounding base station. And a handoff is initiated when the power received from the base station of a neighbouring cell begins to exceed the power received from current base station.

8. What is the condition for intersystem interference?
a) Mobile moves from one cell to another cell
b) Mobile remains in the same cell
c) Mobile moves from one cellular system to another cellular system
d) Mobile remains in the same cluster
View Answer
Answer: c
Explanation: An intersystem handoff is initiated when a mobile moves from one cellular system to another during a course of a call. An MSC engages in an intersystem interference when a mobile becomes weak in a given cell and MSC cannot find another cell to which call can be transferred.
9. What is the disadvantage of guard channel?
a) Efficient utilization of spectrum
b) Cross talk
c) Near far effect
d) Reduce total carried traffic
View Answer
Answer: d
Explanation: Guard channel is a concept for handling priority in handoff. Here, a fraction of the total available channels in a cell is reserved exclusively for handoff requests from ongoing calls. This method has the disadvantage of reducing the total carried traffic, as fewer channels are allocated to originating calls.
10. Which of the following priority handoff method decrease the probability of forced termination of a call due to lack of available channels?
a) Queuing
b) Guard channel
c) Cell dragging
d) Near far effect
View Answer
Answer: a
Explanation: Queuing of handoff requests is a method to decrease the probability of forced termination of a call due to lack of available channels. Queuing of handoff is possible due to the fact that there is a finite time interval between the time the received signal level drops below the handoff threshold and the time the call is terminated.
11. Umbrella cell approach is possible by using _____
a) Antenna of same heights
b) Antenna of different heights
c) Different voice channels
d) Different control channels
View Answer
Answer: b
Explanation: Umbrella cell approach is possible by using different antenna heights and different power levels. By using this approach, it is possible to provide large and small cells which are co-located at a single location.
12. Cell dragging is a problem occur due to _____
a) Pedestrian users
b) Stationary users
c) High speed mobile systems
d) Base stations having same frequency
View Answer

Answer: a
Explanation: Cell dragging is a practical handoff problem in microcell system. It results from pedestrian users that provide a very strong signal to the base station.
13. What was the typical handoff time in first generation analog cellular systems?
a) 1 second
b) 10 seconds
c) 1 minute
d) 10 milliseconds
View Answer
Answer: b
Explanation: In first generation analog cellular system, the typical time to make a handoff once the signal level is below the threshold, is about 10 seconds. This requires the value for threshold to be 6 dB to 12 dB.
14. How much time it takes for handoff in digital cellular systems like GSM?
a) 1 second
b) 10 seconds
c) 1 minute
d) 10 milliseconds
View Answer
Answer: a
Explanation: In digital cellular systems, the mobile assista with the handoff procedure by determining the best candidate. Once the decision is made, it typically requires 1 to 2 seconds for handoff.
15. Soft handoff is also known as _____
a) MAHO
b) Hand over
c) Break before make
d) Make before break
View Answer
Answer: d
Explanation: Soft handoff is one in which the channel in the source cell is retained and used for a while in parallel with the channel in the target cell. In this case, the connection with the receiver target is established before the connection to the source is broken, hence this handover is called make-before-break.
1. Which of the following is not a source of interference?
a) Base station in a different cluster
b) Another mobile in same cell
c) A call in progress in neighbouring cell
d) Any BS operating on same frequency
View Answer
Answer: a
Explanation: Interference is a major limiting factor in the performance of cellular radio systems. Sources of interference includes another mobile in the same cell, a call in progress in neighbouring cell, other base stations operating in the same frequency band, or any non-cellular system which inadvertently leaks energy into the cellular frequency band.
2. Interference on voice channels causes _____
a) Blocked calls
b) Cross talk
c) Queuing

d) Missed calls
View Answer
3. Interference in control channel leads to _____
a) Cross talk
b) Queuing
c) Blocked calls
d) Voice traffic
View Answer
Answer: c
Explanation: On control channels, interference leads to missed and blocked calls. This happens due to errors in the digital signalling.
4. Interference is more severe in rural areas.
a) True
b) False
View Answer
Answer: a
Explanation: Interference is more severe in rural areas. It happens due to the greater RF noise floor and the large number of base stations and mobiles.
5. What are co-channel cells?
a) Cells having different base stations
b) Cells using different frequency
c) Cells using adjacent frequency
d) Cells using same frequency
View Answer
Answer: d
Explanation: Due to frequency reuse concept, there are several cells that use the same set of frequencies. These cells are called co-channel cells. And the interference between these cells is called co-channel interference.

6. Co-channel interference is a function of _____
a) Radius of cell
b) Transmitted power
c) Received power
d) Frequency of mobile user
View Answer
Answer: a
Explanation: This is the case when the size of each cell is approximately the same and the base stations transmit the same power. Co-channel interference ratio is independent of the transmitted power and becomes a function of the radius of the cell ® and the distance between centers of the nearest co channel cell (D).
7. Co-channel reuse ratio is define by _____
a) Q=D*R
b) Q=D/R
c) Q=D^R
d) Q=1/R
View Answer
Answer: b
Explanation: Co-channel reuse ratio is defined by Q=D/R. By increasing the ratio of D/R, the spatial separation between co-channel cells relative to the coverage distance of a cell is

increased. Thus, interference I reduced from improved isolation of RF energy from the co-channel cells.
8. Co-channel ratio in terms of cluster size is defined as _____
a) √ (3N)
b) N
c) 3N
d) √N
View Answer
Answer: a
Explanation: Co-channel reuse is defined using √ (3N). A small value of Q provides larger capacity since the cluster size N is small. However, a large value of Q improves the transmission quality, due to smaller level of co-channel interference.
9. What is the cluster size for CDMA?
a) N=10
b) N=100
c) N=1
d) N=50
View Answer
Answer: c
Explanation: CDMA systems have a cluster size of N=1.Therefore, frequency reuse is not as difficult as for TDMA or first generation cellular systems.
10. What is breathing cell effect?
a) Fixed coverage region
b) Dynamic and time varying coverage region
c) Large coverage region
d) Very small coverage region
View Answer
Answer: b
Explanation: Breathing cell is a concept used by CDMA systems. They had a dynamic, time varying coverage region which varies depending on the instantaneous number of users on the CDMA radio channel.
11. Adjacent channel interference occurs due to _____
a) Power transmitted by Base station
b) MSCs
c) Same frequency of mobile users
d) Imperfect receiver filters
View Answer
Answer: d
Explanation: Interference resulting from signals which are adjacent in frequency to the desired signal is called adjacent channel interference. It results from imperfect receiver filters which allow nearby frequencies to leak into the passband.
12. Which of the following problem occur due to adjacent channel interference?
a) Blocked calls
b) Cross talk
c) Near-far effect
d) Missed calls
View Answer
Answer: c
Explanation: One of the main problems with adjacent channel interference is the near-far

effect. It occurs when a mobile close to a base station transmits on a channel close to one being used by a weak mobile.

13. In near-far effect, a nearby transmitter captures the _____

a) Receiver of the subscriber

b) Transmitter of the subscriber

c) Nearby MSC

d) Neighbouring base station

View Answer

Answer: a

Explanation: Near-far effect occurs if an adjacent channel user is transmitting in very close range to a subscriber's receiver while the receiver attempts to receive a base station on the desired channel. In this effect, a nearby transmitter captures the receiver of the subscriber.

14. Adjacent channel interference can be minimized through _____

a) Changing frequency of base stations

b) Careful filtering and channel assignments

c) Increasing number of base stations

d) Increasing number of control channels

View Answer

Answer: b

Explanation: Adjacent channel assignment can be minimized through careful filtering and channel assignments. Each cell is given only a fraction of the available channels, a cell need not be assigned channels which are all adjacent in frequency.

15. In dynamic channel assignment, any channel which is being used in one cell can be reassigned simultaneously to another cell in the system at a reasonable distance.

a) True

b) False

View Answer

Answer: a

Explanation: Dynamic channel assignment (DCA) is one well known solution to the micro cellular channel assignment problem. The dynamic nature of the strategy permits adaptation to spatial and traffic variations while the distribution of control reduces the required computational load.

27) The shape of the cellular region for maximum radio coverage is
a. Circular
b. Square
c. Oval
d. Hexagon
ANSWER: Hexagon
28) Hexagon shape is used for radio coverage for a cell because
a. It uses the maximum area for coverage
b. Fewer number of cells are required
c. It approximates circular radiation pattern
d. All of the above
ANSWER: All of the above
29) Centre excited hexagonal cells use
a. Sectored directional antennas
b. Omni directional antennas
c. Yagi uda antennas
d. None of the above
ANSWER: Omni directional antennas
30) Spectrum Efficiency of a cellular network is
a. The traffic carried by whole network
b. The traffic carried per cell divided by the bandwidth of the system and the area of a cell
c. Expressed in Erlang /MHz /km^2
d. Both b and c
e. Both a and c
ANSWER: Both b and c
31) The advantage of using frequency reuse is
a. Increased capacity
b. Limited spectrum is required
c. Same spectrum may be allocated to other network
d. All of the above
ANSWER: All of the above
32) The strategies acquired for channel assignment are
a. Fixed
b. Dynamic
c. Regular
d. Both a and b
e. Both b and c
ANSWER: Both a and b
33) In a fixed channel assignment strategy, if all the assigned channels are occupied, the call
a. Gets transferred to another cell
b. Gets blocked
c. Is kept on waiting
d. All of the above
ANSWER: Gets blocked
34) In a fixed channel assignment strategy
a. Each cell is assigned a predetermined set of frequencies
b. The call is served by unused channels of the cell
c. The call gets blocked if all the channels of the cell are occupied
d. All of the above

ANSWER: All of the above

35) In a dynamic channel assignment strategy,

a. Voice channels are not permanently assigned

b. The serving base station requests for a channel from MSC

c. MSC allocates the channel according to the predetermined algorithm

d. All of the above

ANSWER: All of the above

36) Advantage of using Dynamic channel assignment is

a. Blocking is reduced

b. Capacity of the system is increased

c. Both a & b

d. None of the above

ANSWER: Both a & b

37) Disadvantage of using Dynamic channel assignment is

a. More storage required

b. Calculations and analysis is increased

c. Both a & b

d. None of the above

ANSWER: Both a & b

38) In Dynamic channel assignment, any channel which is being used in one cell can be reassigned simultaneously to another cell in the system at a reasonable distance.

a. True

b. False

ANSWER: True

39) In Handoff

a. Process of transferring the call to the new base station

b. Transfers the call

c. New channel allocation is done

d. All of the above

ANSWER: All of the above

40) Delay in handoffs is caused due to

a. Week signal conditions

b. High traffic conditions

c. Un availability of the channel

d. All of the above

ANSWER: All of the above

41) Inter system Handoffs are done

a. When mobile station moves in two cellular systems with different MSC

b. When mobile station moves between two cellular systems

c. When mobile station receives more power from other base station than the serving base station

d. All of the above

ANSWER: All of the above

42) When a fraction of assigned channel is reserved for handoffs, it is

a. Guard channel concept

b. Fixed channel assignment

c. Dynamic channel assignment

d. None of the above

ANSWER: Guard channel concept

43) While handoffs, the termination of call may be avoided by

a. Providing Guard channel
b. Queuing of handoffs
c. Both a & b
d. None of the above
ANSWER: Both a & b
60) Diffraction, at high frequencies, depends upon
1. Geometry of the object
2. Polarization of the incident wave
3. Amplitude of the incident wave
4. Frequency of the incident wave

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 1, 2 and 3 are correct
62) Fresnel Reflection Coefficient is a factor of
1. Polarization of the wave
2. Properties of the material at which reflection occurs
3. Angle of incidence of wave

a. 1 and 2 are correct
b. 1 and 3 are correct
c. All the three are correct
d. 2 and 3 are correct
ANSWER: All the three are correct
65) Fading is caused due to
1. Multi path propagation
2. Obstacles
3. Frequency variations at the source
4. Variation in amplitude and phase at receiver

a. 1 and 2 are correct
b. 1, 2 and 4 are correct
c. 2 and 3 are correct
d. All are correct
ANSWER: 1, 2 and 4 are correct
66) Coherence time refers to
a. Time required to attain a call with the busy base station
b. Time required for synchronization between the transmitter and the receiver
c. Minimum time for change in magnitude and phase of the channel
d. None of the above
ANSWER: Minimum time for change in magnitude and phase of the channel
68) Deep fade is
1. Strong destructive interference
2. Drop in signal to noise ratio
3. Temporary failure of message transfer

a. 1 and 2 are correct
b. 1 and 3 are correct

c. 2 and 3 are correct
d. All are correct
ANSWER: All are correct

122) TDMA is a multiple access technique that has
a. Different users in different time slots
b. Each user is assigned unique frequency slots
c. Each user is assigned a unique code sequence
d. Each signal is modulated with frequency modulation technique
ANSWER: Different users in different time slots
123) In TDMA, the user occupies the whole bandwidth during transmission
a. True
b. False
ANSWER: True
124) TDMA allows the user to have
a. Use of same frequency channel for same time slot
b. Use of same frequency channel for different time slot
c. Use of same time slot for different frequency channel
d. Use of different time slot for different frequency channels
ANSWER: Use of same frequency channel for different time slot
125) GSM is an example of
a. TDMA cellular systems
b. FDMA cellular systems
c. CDMA cellular systems
d. SDMA cellular systems
ANSWER: TDMA cellular systems
126) TDMA is employed with a TDMA frame that has preamble. The preamble contains Address of base station and subscribers
1. Synchronization information
2. Frequency allotted
3. Coded sequence

a. 1 and 2 are correct
b. 1, 2 and 3 are correct
c. 2 and 4 are correct
d. All four are correct
ANSWER: 1 and 2 are correct
127) CDMA is
1. Spread spectrum technology
2. Using same communication medium
3. Every user stays at a certain narrowband channel at a specific time period
4. Each user has unique PN code

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All four are correct
ANSWER: 1, 2 and 4 are correct
129) CDMA is advantageous over other Spread Spectrum techniques for

1. The privacy due to unique codes
2. It rejects narrow band interference
3. Resistance to multi path fading
4. Its ability to frequency reuse

a. 1, 2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: All the four are correct
130) The wide band usage in CDMA helps in
1. Increased immunity to interference
2. Increased immunity to jamming
3. Multiple user access
4. Different spectrum allocation in different time slots

a. 1, 2 and 3 are correct
b. 2, 3 and 4 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: 1, 2 and 3 are correct
131) The advantages of using a CDMA technique over other spread spectrum techniques are
1. Increased capacity
2. Easier handoff
3. Better measure of security
4. Multiple users occupy different spectrum at a time

a. 1, 2 and 3 are correct
b. 2, 3 and 4 are correct
c. 1, 2 and 4 are correct
d. All the four are correct
ANSWER: 1, 2 and 3 are correct
136) The guard interval is provided in OFDM
a. To eliminate the need of pulse shaping filter
b. To eliminate ISI
c. High symbol rate
d. Both a and b
e. Both b and c
ANSWER: Both a and b
144) Coherence time is
a. Directly proportional to Doppler spread
b. Indirectly proportional to Doppler spread
c. Directly proportional to square of Doppler spread
d. Directly proportional to twice of Doppler spread
ANSWER: Directly proportional to Doppler spread
****
***

1) What does LTE stands for?
A) Level Telecom Advanced
B) Long Terminal Advanced
C) Long Term Evolution
D) Long Time Evolution
Answer [=] C
2) Though LTE is treated as a 4G (Fourth Generation) network, it is actually a ___ generation technology as it does not meet expectations.
A) 2.5G
B) 3G
C) 3.5G
D) 3.9G
Answer [=] D
3) What is the Access technique used by an LTE or LTE-A network?
A) WCDMA
B) FDMA
C) PDMA
D) OFDMA
Answer [=]
D
4) What does OFDMA stands for?
A) Original Frequency Division Multiple Access
B) Orthogonal Frequency Division Multiple Access
C) Omitted Frequency Division Multiple Access
D) None
Answer [=]
B
5) What is the carrier Bandwidth in a typical 3G WCDMA based network?
A) 1.4 Mhz
B) 3MHz
C) 5 MHz
D) 10 MHz
Answer [=]
C
6) The Air interface or Radio interface of a 4G LTE network is ____ as a 3G network.
A) Same
B) Not same
C) -
D) -
Answer [=]
B
7) ITU stands for ___.
A) International Television Union
B) Internal Telecommunication Union
C) Inventions for Telecommunication Union
D) International Telecommunication Union
Answer [=]
D

8) IMT-A (International Mobile Telecommunications Advanced) is _____.
A) LTE-A (LTE Advanced)
B) The system that implements specifications of ITU-R(ITU Radiocommunication)
C) Also known as 4.5G
D) All the above
Answer [=]
D

9) What is the name of a Base Transceiver Station in 2G system equivalent in a 4G LTE system?
A) nodeB
B) eNodeB
C) aNodeB
D) nodeBPro
Answer [=]
B
Explanation:
It is nothing but the tower side equipment that serves its users data and voice.
10) The Evolution-Data Optimized Voice (EVDV) based 4G networks are according to ___ standards. (3GPP / 3GPP2)
A) 3GPP
B) 3GPP2
C) -
D) -
Answer [=]
D
Explanation:
3GPP is an acronym for Third Generation Partnership Projects.
11) What is the other name for a 3GPP2 based 4G network?
A) Super Mobile Broadband (SMB)
B) Advanced Mobile Broadband (AMB)
C) Ultra Mobile Broadband (UMB)
D) None
Answer [=]
C
Explanation:
It is based on CDMA 1xEV-DO technology.
12) UMB 4G networks are superseded by ___ networks.
A) EV-DV networks
B) LTE
C) WCDMA
D) None
Answer [=]
B
Explanation:
UMB networks were once deployed and abandoned in North America and a few other countries.
13) What does WIMAX stands for?
A) Wireless Maximum
B) Wireless Intermediate Microwave Access
C) Wireless Interoperability for Microwave Access
D) None
Answer [=]
C
14) What are the advantages of a 4G LTE network over 3G network?
A) More Spectral Efficiency
B) Low power consumption
C) Scalability and Flexibility with other networks
D) All the above
Answer [=]
D

15) What does MIMO stand for?
A) Minimum Interference Maximum Output
B) Minimum Input Multiple Output
C) Multiple Input Multiple Output
D) None

Answer [=]
C
16) What is the round trip latency between a Mobile phone and Base station in a 4G LTE network?
A) 1ms
B) 5ms
C) 10ms
D) 20ms
Answer [=]
C
17) What does AAS represent in a UMB (Ultra Mobile Broadband) based 4G network?
A) Antenna Average System
B) Advanced Antenna System
C) Analog Amplitude System
D) None
Answer [=]
B
18) What is the name given to a 4G LTE or UMB based Core Network Architecture?
A) SAE (System Architecture Evolution)
B) SAP (System Architecture Pro)
C) CAS (Core System Architecture)
D) None
Answer [=]
A
19) What are the differences between FDM and OFDM?
A) FDM uses Guard bands. OFDM does not need Guard bands.
B) FDM transmits data in a big channel. OFDM transmits chunks of data through a group of small channels.
C) FDM is sensitive to Multipath effects and Noise. In OFDM, only very few Sub-channels are affected by Noise and Multipath diversity.
D) All the above
Answer [=]
D
20) Initial 4G LTE standard supported Carrier Aggregation. State TRUE or FALSE.
A) TRUE
B) FALSE
C) -
D) -
Answer [=]
B
Explanation:
Only LTE-A and LTE-A-PRO support Carrier-Aggregation.

This set of Wireless & Mobile Communications Multiple Choice Questions & Answers (MCQs) focuses on “Long Term Evolution (LTE)”.

1. Which UE category supports 64 QAM on the uplink?
a) Only category 5
b) Only category 4
c) Only category 3
d) Category 3,4 and 5
View Answer
Answer: a
Explanation: Category information is used to allow the eNB to communicate effectively with all the UEs connected to it. The UE-category defines a combined uplink and downlink capability. Only UE category 5 supports 64 QAM on the uplink.

2. What type of handovers is supported by LTE?
a) Hard handover only
b) Soft handover only
c) Hard and soft handover
d) Hard, soft and softest handover
View Answer
Answer: a
Explanation: LTE supports only hard handover. It does not receive data from two frequencies at the same time because switching between different carrier frequencies is very fast so soft handover is not required.
3. What is the minimum amount of RF spectrum needed for an FDD LTE radio channel?
a) 1.4 MHz
b) 2.8 MHz
c) 5 MHz
d) 20 MHz
View Answer
Answer: b
Explanation: In telecommunication, Long-Term Evolution (LTE) is a standard for high-speed wireless communication for mobile devices and data terminals, based on the GSM/EDGE and UMTS/HSPA technologies. The minimum amount of RF spectrum needed for an FDD LTE radio channel is 2.8 MHz.
4. Which organization is responsible for developing LTE standards?
a) UMTS
b) 3GPP
c) 3GPP2
d) ISO
View Answer
Answer: b
Explanation: The 3rd Generation Partnership Project (3GPP) is a collaboration between groups of telecommunications standards associations, known as the Organizational Partners. LTE (Long Term Evolution) introduced in 3GPP R8, is the access part of the Evolved Packet System (EPS).
5. Which channel indicates the number of symbols used by the PDCCH?
a) PHICH
b) PDCCH
c) PBCH
d) PCFICH
View Answer

1. 5G was introduced in .....

- July 2016
- July 2019
- July 2020
- July 2018

View Answer
July 2016

2. 5G is the fifth generation technology standard for .....

- Laptops
- Telivisions
- Broadband cellular networks
- None of above

View Answer
Broadband cellular networks

3. 5G was developed by .....

- 3GPP's
- Google
- IBM
- TRAI

View Answer
3GPP's

4. What does G means in 5G?

- Global
- Generation
- Grade
- Gigabytes

View Answer
Generation

5. Are 4G cellphones able to use the 5G networks?

- Yes
- No

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View Answer
No

6. 5G networks operate on up to three frequency bands. these are .....

- Low
- Medium

- High
- All of the Above

View Answer
All of the Above

7. 5G can support up to a ..... devices per square kilometer.

- Million
- Thousand
- Hundred
- None of above

View Answer
Million

8. Which is the first 5G supported smartphone.

- Lenovo Z6 Pro
- iPhone 12 Pro
- Google Pixel 5A
- Samsung Galaxy S20

View Answer
Samsung Galaxy S20

9. The first phase of 3GPP 5G specifications in Release-15 is scheduled to complete in .....

- 2018
- 2019
- 2020
- 2021

View Answer
2019

10. 5G speeds will range from ~50 Mbit/s to over a gigabit/s.

- True
- False

View Answer
True

11. 5G uses an adaptive signal coding system to keep the bit error rate low.

- True
- False

View Answer
True

12. The main advantages of the 5G networks are that they will have .....

- Greater bandwidth
- Higher download speeds
- Higher uploading speeds
- All of the Above

View Answer
All of the Above

Column1	Column2	Column4	Column5	Column6	Column7	Column 8
This sheet is for 3 Mark questions						
S.r No	Question	a	b	c	d	Correct Answer
1	If coherence time of the channel is smaller than the symbol period of the transmitted signal, it is	a. Fast fading	b. Slow fading	c. Frequency selective fading	d. Frequency non selective fading	a
2	In Frequency Selective Fading, the	a. Coherence Bandwidth of the channel is less than bandwidth of transmitted channel	b. Coherence Bandwidth of the channel is more than bandwidth of transmitted channel	c. Coherence Bandwidth of the channel is equal to bandwidth of transmitted channel	d. None of the above	a
3	Flat fading or frequency nonselective fading is a type of	a. Multipath delay spread small scale fading	b. Doppler spread small scale fading	c. Both a & b	d. None of the above	a
4	Coherence time is	a. Directly proportional to Doppler spread	b. Indirectly proportional to Doppler spread	c. Directly proportional to square of Doppler spread	d. Directly proportional to twice of Doppler spread	a
5	To make antenna more directional, either its size must be increased or	a. the number of its feed horns must be increased	b. the frequency of its transmission must be increased	c. its effective isotropic radiated power (EIRP) must be increased	d. its footprint must be increased	b
6	The number of days when Earth's shadow falls on a geosynchronous satellite is	a. 88	b. 277	c. 5	d. 10	a
7	A helical antenna is used for satellite tracking because of …….	a. Circular polarization	b. Manoeuvrability	c. Beamwidth	d. Gain	a
8	……is a loss of power of a satellite downlink signal due to earth's atmosphere.	a. Atmospheric loss	b. Path loss	c. Radiation loss	d. RFI	b

9	At present, the radio-frequency band mainly used by most satellites is …….	a. EHF	b. UHF	c. VHF	d. SHF	d
10	Orbital disturbances of a geosynchronous satellite are caused by the	a. moon	b. sun	c. earth	d. all of the above	d
This sheet is for 2 Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**Correct Answer**
1	What is the name of the database that stores subscriber information under an MSC and his eligible services?	a. MSC	b. HLR	c. EIR	d. AuC	b
2	What is the name of a database used mainly that stores information of a subscriber along with eligible services under roaming or another MSC area?	a. HLR	b. VLR	c. EIR	d. AuC	b
3	Covering area of an MSC is also called ____ ?	a. VLR	b. HLR	c. EIR	d. AUC	b
4	Usually, VLR contains a copy of data of _____ ?	a. HLR	b. EIR	c. AUC	d. none	a
5	Between VLR and HLR, which one is used mostly allow or bar services to the user?	a. VLR	b. HLR	c. Both are used equally	d. None	a
6	Usually, VLR is part of _____ ?	a. HLR	b. EIR	c. AUC	d. MSC	d

7	As VLR is fast to access, VLR avoids frequent accessing of _____ ?	a. EIR	b. AUC	c. HLR	d. None	c
8	In a GSM architecture, which system provides Authentication and Encryption services?	a. HLR	b. VLR	c. EIR	d. AUC	d
9	In a GSM architecture, which system stores the IMEI numbers of all working mobile phones under the network?	a. HLR	b. VLR	c. EIR	d. AUC	c
10	What are the types of lists maintained by EIR (Equipment Identification Register)?	a. Whitelist	b. Grey List	c. Black List	d. All	d
11	Mobile calls to or from Fixed Networks (Landlines) are handled by _____ ?	a. MSC	b. GMSC (Gateway MSC.	c. HLR	d. VLR	b
12	Each cell in a GSM network has ?	a. Cell number	b. Cell Global number	c. Cell Global Identity number	d. None	c
13	A group of cells in a GSM network has a _____ number.	a. Location number	b. Location Area number	c. Location Area Identity number	d. None	c
14	A single MSC or VLR can have many _____ ?	a. HLR	b. Location Areas (LA)	c. CGI - Cell Global Index	d. None	b
15	Total area served by one network operator is called _____ ?	a. PSTN	b. PLMN	c. LA	d. CGI	b
This sheet is for 1 Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**Correct Answer**
1	1G or First-Generation Mobile Network is _____?	a. Analog	b. Digital	c. Sequential	d. Fuzzy	a.
2	In a 1G network, the type of communication between Tower of BTS and Switching Center is _____?	a. Analog	b. Digital	c. Discrete	d. Diminished	b.

3	What are main problems in 1G technology?	a. Noise	b. Security	c. Poor Battery backup	d. All the above	d.
4	What is the Cell Size or Coverage Area in 1G technology?	a. 1-5Km	b. 20-60Km	c. 5-50Km	d. 2-30Km	d.
5	Modulation technique employed by AMPS 1G network is _____?	a. TDMA	b. FDMA	c. CDMA	d. PDMA	b.
6	DAMPS or Digital-AMPS network is treated as a ___ network.	a. 1G	b. 2G	c. 1.5G	d. None of the above	b.
7	What are the three main parts of a GSM Architecture or Structure?	a. Mobile Station	b. BSS - Base Station Subsystem	c. NSS - Network and Switching Subsystem	d. All the above	d.
8	What are the main parts of a Mobile Station in a GSM Network?	a. MT - Mobile Terminal	b. SIM - Subscriber Identity Module	c. Both A and B	d. None	c.
9	What are the main parts of a BSS (Base Station Subsystem) in a GSM network?	a. BTS - Base Transceiver Station	b. BSC - Base Station Controller	c. A and B	d. None	c.
10	What are the main parts of a NSS (Network and Switching Subsystem) of a GSM Architecture?	a. MSC - Mobile Switching Center	b. HLR & AuC	c. VLR, EIR	d. All the above	d.
11	A BTS is also called _____ by general public?	a. Mobile tower	b. Exchange	c. Charging Point	d. None	a.
12	What controller a group of BTS or Cell Towers?	a. BSC	b. MSC	c. HLR	d. VLR	a.
13	What are the functions of a BSC?	a. Handovers, exchange functions	b. Frequency hopping	c. Control of radio frequency power level of BTS	d. All	d.
14	What is the main function of NSS?	a. Establishing communication between mobile and landline numbers.	b. Providing eligible services to the subscriber	c. Providing parameters for Authentication and Encryption	d. All	d.

15	Each SIM is identified by a unique _____ number?	a. IMSI	b. IMEI	c. MSDN	d. None	a.
UNIT2						
This sheet is for 3 Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**Correct Answer**
1	If more number of cells are necessary in the frequency reuse distance, then the segmentation & dualization techniques get _____	**a.** united	**b.** divided	**c.** restricted	**d.** filtered	a
2	Which method of cellular network assists in minimizing the co-channel interference associated with the angle of degree?	**a.** Cell Splitting	**b.** Cell Sectoring	**c.** Cell Segmentation & Dualization	**d.** None of the above	b
3	Which effect is widespread in adjacent-channel interference especially after the reception of a weak signal by a mobile user from the base-station?	**a.** Near-far effect	**b.** Doppler's effect	**c.** Capture effect	**d.** Kendall effect	a
4	In a cellular telephone system, which type of interference results from imperfect design of filters in receivers by allowing nearby frequencies to enter the receiver?	**a.** Co-channel Interference	**b.** Adjacent-channel Interference	**c.** Both a and b	**d.** None of the above	b
5	Which antennas are used at the center of the cells for the system with hexagonal-shaped cells?	**a.** Omni-directional antennas	**b.** Sectored directional antennas	**c.** Both a and b	**d.** None of the above	a
6	If the system is designed with the usage of hexagonal-shaped cells, how are the base-stations located?	**a.** At the centre of cell	**b.** At the edge of cell	**c.** At the corner of the cell	**d.** All of the above	d
7	Which hand-off stage deals with the relinquishment of unnecessary frequency channels by keeping the availability for other mobile users?	**a.** Initialization	**b.** Resource Reservation	**c.** Call Execution	**d.** Call Completion	d

8	In cellular telephone network, which component controls the switching between public wireline telephone network and the base station of cells for supporting the different calls between landline to mobile, mobile to landline and mobile to mobile calls?	**a.** Electronic Switching Center (ESC)	**b.** A Cell Controller	**c.** Radio Transmitter & Receiver	**d.** A common communication protocol	a
9	Which among the following represents the flawless hand-off with no perceivable interruption of service?	**a.** Hard hand-off	**b.** Soft hand-off	**c.** Intracell hand-off	**d.** Intercell hand-off	b
#	Coherence time refers to	a. Time required to attain a call with the busy base station	b. Time required for synchronization between the transmitter and the receiver	c. Minimum time for change in magnitude and phase of the channel	d. None of the above	c
This sheet is for 2 Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**Correct Answer**
1	Radio capacity may be increased in cellular concept by	a. Increase in radio spectrum	b. Increasing the number of base stations & reusing the channels	c. Both a & b	d. None of the above	b
2	Spectrum Efficiency of a cellular network is	a. The traffic carried by whole network	b. The traffic carried per cell divided by the bandwidth of the system and the area of a cell	c. Expressed in Erlang /MHz /km2	d. Both b and c	d
3	The advantage of using frequency reuse is	a. Increased capacity	b. Limited spectrum is required	c. Same spectrum may be allocated to other network	d. All of the above	d
4	The strategies acquired for channel assignment are	a. Fixed	b. Dynamic	c. Regular	d. Both a and b	d

5	The techniques used to improve the capacity of cellular systems are	a. Splitting	b. Sectoring	c. Coverage zone approach	d. All of the above	d
6	In spread spectrum technique, the multiple users are assigned with	a. Same spectrum and same PN code	b. Same spectrum and different PN code	c. Different spectrum and different PN code	d. Different spectrum and same PN code	b
7	Direct sequence spread spectrum demodulation uses	a. DPSK	b. FSK	c. ASK	d. QPSK	a
8	Fast hopping is	a. More than one frequency hop during each symbol	b. Hopping rate greater than or equal to information symbol rate	c. One or more symbols transmitted between frequency hops	d. Both a and b	d
9	Pure ALOHA is a	a. Random access protocol	b. Scheduled access protocol	c. Hybrid access protocol	d. Demand access protocol	a
10	The increase in number of users in PURE ALOHA causes	a. Increase in delay	b. Increase in probability of collision	c. Increase in spectrum	d. Both a and b	d
This sheet is for 1 Mark questions						
S.r No	Question	a	b	c	d	Correct Answer
1	In Handoff	a. Process of transferring the call to the new base station	b. transfers the call	c. New channel allocation is done	d. All of the above	d
#	Delay in handoffs is caused due to	a. Week signal conditions	b. High traffic conditions	c. Un availability of the channel	d. All of the above	d

#	Inter system Handoffs are done	a. When mobile station moves in two cellular systems with different MSC	b. When mobile station moves between two cellular systems	c. When mobile station receives more power from other base station than the serving base station	d. All of the above	d
4	When a fraction of assigned channel is reserved for handoffs, it is	a. Guard channel concept	b. Fixed channel assignment	c. Dynamic channel assignment	d. None of the above	a
#	While handoffs, the termination of call may be avoided by	a. Providing Guard channel	b. Queuing of handoffs	c. Both a) and b)	d. None of the above	c
#	Dwell time is the time for	a. A call within the cell	b. Hand off	c. Waiting for channel allocation	d. None of the above	a
7	Dwell time depends upon	a. Interference	b. Distance between the subscriber and the base station	c. Propagation of call	d. All of the above	d
8	Mobile Assisted Handoff (MAHO) provides	a. Faster handoffs	b. Suitability for frequent handoffs	c. MSC need not monitor the signal strength	d. All of the above	d
9	Co- channel reuse ratio depends upon	a. Radius of the cell	b. Distance between the centers of the co channel cells	c. Frequency allocation of nearest cells	d. Both a) and b)	d
#	Interference in frequency bands may lead to	a. Cross talk	b. Missed calls	c. Blocked calls	d. All of the above	d
UNIT 3						
This sheet is for 3 Mark						

questions						
S.r No	Question	a	b	c	d	Correct Answer
1	What is the size of MAC Address?	a. 48 bits	b. 16 bits	c. 32 bits	d. 8 bits	a
2	The guard interval is provided in OFDM	a. To eliminate the need of pulse shaping filter	b. To eliminate ISI	c. High symbol rate	d. Both a) and b)	d
3	The increase in number of users in PURE ALOHA causes	a. Increase in delay	b. Increase in probability of collision	c. Increase in spectrum	d. Both a) and b)	d
4	TDMA is used instead of TDM when:	a. all the signals come from the same source	b. the signals come from different sources	c. TDM is used in RF communications	d. they mean the same thing	b
5	When calculating the maximum number of users, a limiting factor in FDM is:	a. the type of media used	b. the length of the channel	c. the bandwidth of each signal	d. all of the above	c
6	Spread-spectrum can be done by using:	a. computer-controlled frequency reuse	b. frequency-hopping	c. direct-sequence method	d. all of the above	d
7	For a given data rate, direct-sequence systems, compared to standard RF systems, use:	a. about the same bandwidth	b. much more bandwidth	c. much less bandwidth	d. approximately double the bandwidth	b
8	A receiver for frequency-hopping spread-spectrum would be:	a. a narrowband receiver	b. a wideband receiver	c. a direct-conversion receiver	d. a CDMA receiver	a
9	CDMA:	a. cannot be used with frequency-hopping spread-spectrum	b. cannot be used with direct-sequence spread-spectrum	c. cannot be used on an RF channel	d. allows many transmitters to use a band simultaneously	d
#	For optimal performance, CDMA requires the use of:	a. orthogonal PN sequences	b. non-orthogonal PN sequences	c. true-random PN sequences	d. none of the above	a

This sheet is for 2 Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**Correct Answer**
1	Which filter is used to get the final FHSS signal?	**a.** Low pass filter	**b.** High pass filter	**c.** Band pass filter	**d.** Band stop filter	c
2	The minimum spacing between consecutive hop positions gives the	**a.** Minimum number of chips necessary	**b.** Maximum number of chips necessary	**c.** Chip rate	**d.** None of the mentioned	a
3	Which system allows larger processing gain?	**a.** Direct sequence	**b**. Frequency hopping	**c.** Direct sequence & Frequency hopping	**d.** None of the mentioned	b
4	Spread spectrum makes _____ difficult.	**a.** Jamming	**b.** Interception	**c.** Jamming & Interception	**d.** None of the mentioned	c
5	Spread spectrum has immunity from	**1.** Noise	**2.** Multi-path distortion	**3.** Noise & Multi-path distortion	**4.** None of the mentioned	c
6	Frequency hopping system can provide reliable mitigation only if	**a.** Hopping rate is greater than the symbol rate	**b.** Hopping bandwidth is large	**c.** Hopping rate is greater than the symbol rate & its bandwidth is large	**d.** None of the mentioned	c
7	For QAM, a “constellation diagram” shows:	a. location of symbols in “symbol space”	b. separation of symbols in “symbol space”	c. effects of noise on symbols	d. all of the above	d
8	For QAM, the two dimensions of its symbol space are:	a. amplitude and frequency	b. amplitude and phase angle	c. frequency and phase angle	d. I-bits and Q-bits	b
9	**QPSK is a modulation scheme where each symbol consists of**	a. 4 bits	b. 2 bits	c. 1 bit	d. M number of bits, depending upon the requirement	b
10	**The data rate of QPSK is _____ of BPSK.**	a. Thrice	b. Four times	c. Twice	d. same	c
This sheet is for 1 Mark						

questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**Correct Answer**
1	_____ is a server problem of wireless networks using CDM	a. Hidden and Exposed Terminals.	b. Near and Far Terminals.	c. Open and Close Terminals.	d. First and Last terminals.	b
2	TDMA is a multiple access technique that has	a. Different users in different time slots	b. Each user is assigned unique frequency slots	c. Each user is assigned a unique code sequence	d. Each signal is modulated with frequency modulation technique	a
3	TDMA allows the user to have	a. Use of same frequency channel for same time slot	b. Use of same frequency channel for different time slot	c. Use of same time slot for different frequency channel	d. Use of different time slot for different frequency channels	b
4	GSM is an example of	a. TDMA cellular systems	b. FDMA cellular systems	c. CDMA cellular systems	d. SDMA cellular systems	a
5	Global Positioning System uses	a. CDMA	b. TDMA	c. SDMA	d. FDMA	a
6	The guard interval is provided in OFDM	a. To eliminate the need of pulse shaping filter	b. To eliminate ISI	c. High symbol rate	d. Both a and b	d
7	In DSSS the signal is recovered using	a. Low pass filter	b. High pass filter	c. Band pass filter	d. Band stop filter	c
8	Fast frequency hopping is	a. Several modulations per hop	b. Several modulations per symbol	c. Several symbols per modulation	d. None of the mentioned	d
9	In which technique is phase coherence hard to maintain?	a. Direct sequence	b. Frequency hopping	c. Direct sequence & Frequency hopping	d. None of the mentioned	b
10	The frequency hopping system uses _____ modulation scheme.	a. FSK	b. BPSK	c. MFSK	d. MPSK	c
UNIT 4						
This sheet is for 3 Mark						

questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**Correct Answer**
1	Which technique of GSM Architecture tells the mobile to advance it's transmission bursts (data) so that overlap with other bursts may be avoided at channel?	a. DTX	b. TA - Timing Advance	c. Power Control	d. None	b
2	What is the total number of Carrier Frequencies that can be formed in a 25MHz band width of either Uplink or Downlink of GSM?	a. 128	b. 126	c. 124	d. None	c
3	What is the data rate or speed offered by a GPRS connection?	a. 56-115kbps	b. 9-256kbps	c. 64-128kbps	d. None	a
4	GPRS uses which unused channels for transportation of Data in general?	a. SDCCH	b. BCCH	c. TCH	d. SCH	c
5	In a GPRS network, SGSN is the equivalent of _____ system in GSM.	a. BSC	b. MSC	c. VLR	d. GMSC	b
6	GPRS Roaming from one SGSN to another SGSN is offered by ?	a. GMSC	b. GGSN	c. HLR	d. VLR	b
7	A GPRS network contains Firewalls to _____?	a. Hack phones	b. Intercept phones	c. Protection from Virus	d. None	c
8	A GPRS Network is a part of ____ in GSM network.	a. BTS	b. BSS	c. NSS	d. VLR	c
9	Which is the main protocol that transfers packets in a GPRS Core network?	a. GTP	b. SSTP	c. SCTP	d. None	a
#	What is the interface between GGSN and External Packet Network(Internet) in a GPRS structure?	a. Gs	b. Gn	c. Gi	d. Gp	c
This sheet is for 2 Mark questions						

S.r No	Question	a	b	c	d	Correct Answer
1	Each cell in a GSM network has ?	a. Cell number	b. Cell Global number	c. Cell Global Identity number	d. None	c
2	A group of cells in a GSM network has a _____ number.	a. Location number	b. Location Area number	c. Location Area Identity number	d. None	c
3	Power control feature in a GSM network works on the _____ side?	a. Mobile side	b. BTS side	c. Both Mobile side and BTS side	d. None	c
4	Discontinuous Reception in a GSM network is aimed at saving _____ power.	a. BTS	b. BSC	c. Mobile Station	d. None	c
5	Discontinuous Reception is implemented with _____ in a GSM network.	a. Sideband channel	b. Pilot channel	c. Paging channel Sub channels	d. None	c
6	What is the duration of a GSM TDMA Frame?	a. 4.614ms	b. 5.614ms	c. 6.614ms	d. None	a
7	What are the types of Logical channels in a GSM Structure or Architecture?	a. Traffic channels	b. Broadcasting channels	c. Common control channels, Dedicated control channels	d. All	d
8	Majority of the GSM Channels work on _____ interface?	a. Abis interface	b. A interface	c. Um interface	d. M interface	c
9	Choose a Broadcast channel in GSM Architecture?	a. BCCH (Broadcast Control Channel)	b. FCCH (Frequency Correction Channel)	c. SCH (Synchronization Channel), CBCH (Cell Broadcast Channel)	d. All	d
#	What is TRUE about a SCH channel of GSM Architecture?	a. It carries Time Synchronization data	b. It contains BSIC (Base Station Identity Code)	c. It contains TDMA Frame number	d. All	d
This						

sheet is for 1 Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**Correct Answer**
1	What are the three main parts of a GSM Architecture or Structure?	a. Mobile Station	b. BSS - Base Station Subsystem	c. NSS - Network and Switching Subsystem	d. All the above	d
2	What are the main parts of a Mobile Station in a GSM Network?	a. MT - Mobile Terminal	b. SIM - Subscriber Identity Module	c. Both A and B	d. None	c
3	What are the main parts of a BSS (Base Station Subsystem) in a GSM network?	a. BTS - Base Transceiver Station	b. BSC - Base Station Controller	c. A and B	d. None	c
4	Each Mobile Terminal is identified by a unique _____ number?	a. IMEI	b. SIM	c. IMSI	d. None	a
5	Each SIM is identified by a unique _____ number?	a. IMSI	b. IMEI	c. MSDN	d. None	a
6	Your mobile number is actually called _____ number.	a. IMSI	b. SIM	c. MSISDN	d. None	c
7	IMSI number of a SIM is also called?	a. MSISDN	b. IMEI	c. ICCID	d. None	a
8	What is PUK code of a SIM?	a. PIN Unlock Key	b. 4 digit code	c. It is like a password to enter after inserting SIM in a mobile for the first time. It prevents misuse.	d. All	d
9	What is the maximum number of Transceivers a BTS can handle is ?	a. 8	b. 12	c. 16	d. 22	c

#	What are the functions of a BSC?	a. Handovers, exchange functions	b. Frequency hopping	c. Control of radio frequency power level of BTS	d. All	d
UNIT 5						
This sheet is for 3 Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**Correct Answer**
1	What is the interface between NodeB and RNC in a WCDMA network?	a. Lub	b. Luc	c. Lud	d. Lue	a
2	Which is the technology used by WCDMA to transfer data packets in its RAN network (Air Interface + Nodeb.?	a. IP	b. Frame Relay	c. ATM (Asynchronous Transfer Mode)	d. None	c
3	Identify CDMA Forward Channels below.	a. F-PICH (Forward Pilot Channel)	b. F-PCH (Forward Paging Channel)	c. F-SYNCH (Forward Sync Channel)	d. All the above	d
4	Identify CDMA Reverse Channels below.	a. R-SCH (Reverse Supplemental Channel)	b. R-SCCH (Reverse Supplemental Code Channel)	c. R-PCSCH (Reverse Power Control Sub-Channel)	d. All the above	d
5	Which technology among the following offers High-Speed Packet Data?	a. CDMAOne	b. CDMA2000 1x	c. CDMA 1xEV	d. None	c
6	What is the Channel bandwidth of an EV-DO carrier?	a. 1 MHz	b. 1.25 MHz	c. 5 MHz	d. None	b
7	An EV-DO carrier has the same bandwidth of ____.	a. IS-95A CDMA	b. IS-2000 1xRTT	c. IS-95A and IS-2000 1xRTT	d. None	c
8	A CDMA2000 1xEV-DO offers data services through ___ switching.	a. Circuit Switching	b. Packet Switching	c. Circuit and Packet Switching	d. None	b

9	High Rate Packet Data Access (HRPDa. of a EV-DO Rev-A provided good data rates due to _____ techniques.	a. Spread Carrier	b. Mobility Management	c. Both SC (Spread Carrier) and MM (Mobility Management)	d. None	c
#	In a CDMA2000 1xEV-DO network, Forward channels always transmit at ____ power.	a. Half power	b. Variable Power	c. Full Power	d. None	c
This sheet is for 2 Mark questions						

S.r No	Question	a	b	c	d	Correct Answer
1	EDGE services are considered as _____ generation services.	a. 2G	b. 2.5G	c. 3G	d. None of the above	a
2	What is the maximum data rate supported by a 3G network or UMTS network?	a. 384 kbps	b. 2 Mbps	c. 32 Mbps	d. 42 Mbps	d
3	CDMA2000 technology is also a ___ network.	a. 2G	b. 3G	c. 4G	d. None	b
4	Most of the CDMA2000 (IS-2000) channels and functionalities are similar to ___.	a. IS-95	b. EVDO-95	c. UMTS	d. WCDMA	a
5	What does EVDO stand for in a CDMA2000 1x network?	a. Evolved Variable Data Optimized	b. Evolution-Data Optimized	c. Enhanced Data Optimized	d. None	b
6	CDMA 1x Ev-DO is a successor to ____.	a. CDMAOne	b. CDMA2000 1x	c. CDMA IS-95	d. None	b
7	What does CDMA2000 1x provides?	a. Voice	b. Data	c. Voice and Data	d. None	c
8	What is the basic data rate (Minimum data rate) in an EV-DO network?	a. 32 Kbps	b. 38.4 Kbps	c. 56 Kbps	d. 64 Kbps	b
9	In an EVDO network, all users of the same Sector share ___ in a TDMA mode.	a. Channel	b. Frequency	c. Code	d. None	a
#	CDMA2000 1xEV-DO follows ___ power control for Reverse channels.	a. Fixed	b. Dynamic	c. No power control	d. -	b
This						

sheet is for 1 Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**Correct Answer**
1	EDGE stands for?	a. Enhanced Data Rate for GSM Evolution	b. Enhanced Data for GSM	c. Enhanced Data for GSM Enhanced	d. None of the above	a
2	3GPP stands for ____?	a. 3rd Generation Pulse Project	b. 3rd Generation Partnership Project	c. 3rd Generation Protocols Project	d. None	b
3	What is the modulation technique used by WCDMA technology?	a. Amplitude Modulation	b. Separate Spectrum Modulation	c. Spread Spectrum Modulation	d. None	d
4	What is the Code name for CDMA2000 1xEV-DO?	a. IS-95	b. IS-2000	c. IS-856	d. None	c
5	EV-DV stands for ___.	a. Evolution-Data Variable	b. Evolution-Data Versatile	c. Evolution Data and Voice	d. Enhanced Data and Voice	c
6	What is the Multiplexing technique followed by an 1xEV-DO network?	a. FDM (Frequency Division Multiplexing)	b. PDM (Phase Division Multiplexing)	c. TDM (Time Division Multiplexing)	d. None	c
7	A Virtual Soft Handoff in a 1xEVDO system works in ___ way.	a. Forward	b. Reverse	c. Both Forward and Reverse	d. None	a
8	What are the handoffs implemented in a CDMA2000 1x network?	a. Soft Forward and Soft Reverse handoffs	b. Hard Forward and Hard Reverse Handoffs	c. Both A and B	d. None	c
9	Choose a correct statement about CDMA2000 1x network.	a. It uses Convolution Code	b. It uses Turbo Code	c. It uses 48 Order FIR filter.	d. All	d
#	What are the Handoffs implemented in a CDMA2000 1x-EV-DO network?	a. Forward Virtual Soft Handoff	b. Reverse Soft Handoff	c. A and B	d. None	c
UNIT 6						

This sheet is for 3 Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**correct answer**
#	How will we interact with technology in the future?	a. A Keyboard	b. Voice	c. Eyes	d. Thoughts	d
2	An example of non-immersive VR device is	a. An IMAX	b. An iPad	c. A virtual reality headset	d. A screen projection	b
#	Virtual Reality	a. places the experiencer in another location entirely. Whether that location has been generated by a computer or captured by video, it entirely occludes the experiencer's natural surroundings.	b.is the view that is visible to the experiencer while rotating their head from a fixed body position. The average human field of view is approximately 200 degrees.	c. Anything related to or that will impact the user's attitude or emotions for a product, system or service.	d. a set of goggles or a helmet with tiny monitors in front of each eye to generate images seen by the wearer as three-dimensional	a
#	Which definition best fits "Augmented Reality"?	a. Technology that turns physical objects into digital objects	b. Technology that overlays digital information on top of real world items	c. Technology that completely immerses users in a new digital environment	d. Technology that can achieve a human-level understanding of images	b

#	Virtual Reality	a. An open-source operating system for mobile devices created by Google	b. Images, videos, animations or even 3D models that appear whenever Cospaces sees an image that it recognises	c. The computer-generated simulation of a three-dimensional image or environment that can be interacted with in a seemingly real or physical way by a person using special electronic equipment, such as the Oculus Rift	d. An image or graphic superimposed over an Image Target	c
This sheet is for 3 Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**correct answer**
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This sheet is for 2 Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**correct answer**
1	What is the other name for a 3GPP2 based 4G network?	A) Super Mobile Broadband (SMB)	B) Advanced Mobile Broadband (AMB)	C) Ultra Mobile Broadband (UMB)	D) None	c
2	This game launched augmented reality (AR) into the spotlight in recent years...	a. Super Mario	b. Pokemon	cWorld of Warcraft	d.Fortnite	b

3	Augmented reality (AR) provides features that are...	a. Visual, interactive, and 3D	b. Collaborative, virtual, and simulated	c. Computer-generated, sensory, and virtual	d. Sounds, sensory, and cost-efficient	a
4	Which definition best fits "Augmented Reality"?	a. Technology that turns physical objects into digital objects	b. Technology that overlays digital information on top of real world items	c. Technology that puts users in a new digital environment	d. Technology that can achieve a human-level understanding of images	b
5	AR technology allows students to interact with the physical world by _____.	a. Moving around to change perspectives	b. Moving closer/further to change scale	c. Select virtual objects by pointing to them	d. All of the above	d
6	What group was one of the first to start using Augmented Reality?	a. Doctors	b. The Military	c.Businessmen	d. Engineers	b
7	What is AR?	a. When environment is fully computer generated	b. Users immersed in virtual environment	c. A type of video camera	d. A reindeer stuck in a bucket	a
8	Mixed Reality is _____.	a. curve fitting	b. When virtual object overlaid on real-world environment	c. When virtual world combined with real- world	d. All of the above	c
9	Which of the following is a characteristic of Virtual Reality?	a. Simulates complete or partial real-world experience	b. Created by a computer	c. Stimulates senses like sight, hearing, and touch	d. All of the answers are correct.	d
#	Which one of the senses does not applied in Virtual Reality?	a. Sound	b. Vision	c. Touch	d. Taste	d
This sheet is for 1						

Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**correct answer**
1	What is the Access technique used by an LTE or LTE-A network?	A) WCDMA	B) FDMA	C) PDMA	D) OFDMA	d
2	What is the main way we interact with technology currently?	a. A Keyboard	b. Voice	c. Eyes	d. Thoughts	a
3	How do most people use AR currently?	a. Their computers	b.Their phones	c. Their TV's	d. AR Goggles	b
4	What does 5G stand for?	a.The fifth generation of mobile device technology.	b. The fifth generation of wireless network technology.	c. The fifth generation of data processing techology.	d. None of these	b
5	_____ is the foundation of our 4G LTE network.	a. 600MHz	b. 800MHz	c. 700MHz	d. None of these	a
6	Which of the following is NOT a constraint of VR?	a. It can only be used for Science and Geography	b. It can be costly	c. Developing lessons/experiences can be time consuming	d.Resistance to new technology from teachers	a
7	What are the 3 types of VR?	a. Immersive, 3D, non-immersive	b. Immersive, semi-immersive, non-immersive	c. Digital, semi-immersive, projective	d. 3D, non-immersive, digital	b
8	Difference between VR and AR	a. VR adds to your vision | AR replaces it	b. VR is real world | AR is virtual environment	c.VR is like YouTube | AR is like African Technology	d.VR replaces your vision | AR adds to it	d
9	What does AR stand for?	a. Augmented Realistic	b. Armed Reindeers	c. Augmented Reality	d. Augmented Real	c
#	What is VR NOT used for?	a. Video Games	b. Military Training	c.Flight Simulation	d.Swimming Goggles	d

This sheet is for 1 Mark questions							
S.r No	Question	Image	a	b	c	d	Correct Answer
1	1G or First-Generation Mobile Network is _____?		a. Analog	b. Digital	c. Sequential	d. Fuzzy	a.
2	In a 1G network, the type of communication between Tower of BTS and Switching Center is _____?		a. Analog	b. Digital	c. Discrete	d. Diminished	b.
3	What are main problems in 1G technology?		a. Noise	b. Security	c. Poor Battery backup	d. All the above	d.
4	What is the Cell Size or Coverage Area in 1G technology?		a. 1-5Km	b. 20-60Km	c. 5-50Km	d. 2-30Km	d.
5	Modulation technique employed by AMPS 1G network is _____?		a. TDMA	b. FDMA	c. CDMA	d. PDMA	b.
6	DAMPS or Digital-AMPS network is treated as a ___ network.		a. 1G	b. 2G	c. 1.5G	d. None of the above	b.
7	What are the three main parts of a GSM Architecture or Structure?		a. Mobile Station	b. BSS - Base Station Subsystem	c. NSS - Network and Switching Subsystem	d. All the above	d.
8	What are the main parts of a Mobile Station in a GSM Network?		a. MT - Mobile Terminal	b. SIM - Subscriber Identity Module	c. Both A and B	d. None	c.
9	What are the main parts of a BSS (Base Station Subsystem) in a GSM network?		a. BTS - Base Transceiver Station	b. BSC - Base Station Controller	c. A and B	d. None	c.
10	What are the main parts of a NSS (Network and Switching Subsystem) of a GSM Architecture?		a. MSC - Mobile Switching Center	b. HLR & AuC	c. VLR, EIR	d. All the above	d.
11	A BTS is also called _____ by general public?		a. Mobile tower	b. Exchange	c. Charging Point	d. None	a.
12	What controller a group of BTS or Cell Towers?		a. BSC	b. MSC	c. HLR	d. VLR	a.

13	What are the functions of a BSC?		a. Handovers, exchange functions	b. Frequency hopping	c. Control of radio frequency power level of BTS	d. All	d.
14	What is the main function of NSS?		a. Establishing communication between mobile and landline numbers.	b. Providing eligible services to the subscriber	c. Providing parameters for Authentication and Encryption	d. All	d.
15	Each SIM is identified by a unique _____ number?		a. IMSI	b. IMEI	c. MSDN	d. None	a.

This sheet is for 2 Mark questions							
S.r No	**Question**	**Image**	**a**	**b**	**c**	**d**	**Correct Answer**
1	What is the name of the database that stores subscriber information under an MSC and his eligible services?		a. MSC	b. HLR	c. EIR	d. AuC	b
2	What is the name of a database used mainly that stores information of a subscriber along with eligible services under roaming or another MSC area?		a. HLR	b. VLR	c. EIR	d. AuC	b
3	Covering area of an MSC is also called ____ ?		a. VLR	b. HLR	c. EIR	d. AUC	b
4	Usually, VLR contains a copy of data of _____ ?		a. HLR	b. EIR	c. AUC	d. none	a
5	Between VLR and HLR, which one is used mostly allow or bar services to the user?		a. VLR	b. HLR	c. Both a	d. None	a
6	Usually, VLR is part of _____?		a. HLR	b. EIR	c. AUC	d. MSC	d
7	As VLR is fast to access, VLR avoids frequent accessing of _____ ?		a. EIR	b. AUC	c. HLR	d. None	c
8	In a GSM architecture, which system provides Authentication and Encryption services?		a. HLR	b. VLR	c. EIR	d. AUC	d
9	In a GSM architecture, which system stores the IMEI numbers of all working mobile phones under the network?		a. HLR	b. VLR	c. EIR	d. AUC	c

10	What are the types of lists maintained by EIR (Equipment Identification Register)?		a. Whitelist	b. Grey List	c. Black List	d. All	d
11	Mobile calls to or from Fixed Networks (Landlines) are handled by _____ ?		a. MSC	b. GMSC (Gateway MSC.	c. HLR	d. VLR	b
12	Each cell in a GSM network has ?		a. Cell number	b. Cell Global number	c. Cell Global Identity number	d. None	c
13	A group of cells in a GSM network has a _____ number.		a. Location number	b. Location Area number	c. Location Area Identity number	d. None	c
14	A single MSC or VLR can have many _____ ?		a. HLR	b. Location Areas (LA)	c. CGI - Cell Global Index	d. None	b
15	Total area served by one network operator is called _____ ?		a. PSTN	b. PLMN	c. LA	d. CGI	b

This sheet is for 3 Mark questions							
S.r No	Question	Image	a	b	c	d	Correct Answer
1	If coherence time of the channel is smaller than the symbol period of the transmitted signal, it is		a. Fast fading	b. Slow fading	c. Frequency selective fading	d. Frequency non selective fading	a
2	In Frequency Selective Fading, the		a. Coherence Bandwidth of the channel is less than bandwidth of transmitted channel	b. Coherence Bandwidth of the channel is more than bandwidth of transmitted channel	c. Coherence Bandwidth of the channel is equal to bandwidth of transmitted channel	d. None of the above	a
3	Flat fading or frequency nonselective fading is a type of		a. Multipath delay spread small scale fading	b. Doppler spread small scale fading	c. Both a & b	d. None of the above	a
4	Coherence time is		a. Directly proportional to Doppler spread	b. Indirectly proportional to Doppler spread	c. Directly proportional to square of Doppler spread	d. Directly proportional to twice of Doppler spread	a
5	To make antenna more directional, either its size must be increased or		a. the number of its feed horns must be increased	b. the frequency of its transmission must be increased	c. its effective isotropic radiated power (EIRP) must be increased	d. its footprint must be increased	b
6	The number of days when Earth's shadow falls on a geosynchronous satellite is		a. 88	b. 277	c. 5	d. 10	a
7	A helical antenna is used for satellite tracking because of ……..		a. Circular polarization	b. Manoeuvrability	c. Beamwidth	d. Gain	a
8	…….is a loss of power of a satellite downlink signal due to earth's atmosphere.		a. Atmospheric loss	b. Path loss	c. Radiation loss	d. RFI	b

9	At present, the radio-frequency band mainly used by most satellites is …….		a. EHF	b. UHF	c. VHF	d. SHF	d	
10	Orbital disturbances of a geosynchronous satellite are caused by the		a. moon	b. sun	c. earth	d. all of the above	d	

This sheet is for 1 Mark questions							
S.r No	Question	Image	a	b	c	d	Correct Answer
1	In Handoff		a. Process of transferring the call to the new base station	b. transfers the call	c. New channel allocation is done	d. All of the above	d
2	Delay in handoffs is caused due to		a. Week signal conditions	b. High traffic conditions	c. Un availability of the channel	d. All of the above	d
3	Inter system Handoffs are done		a. When mobile station moves in two cellular systems with different MSC	b. When mobile station moves between two cellular systems	c. When mobile station receives more power from other base station than the serving base station	d. All of the above	d
4	When a fraction of assigned channel is reserved for handoffs, it is		a. Guard channel concept	b. Fixed channel assignment	c. Dynamic channel assignment	d. None of the above	a
5	While handoffs, the termination of call may be avoided by		a. Providing Guard channel	b. Queuing of handoffs	c. Both a) and b)	d. None of the above	c
6	Dwell time is the time for		a. A call within the cell	b. Hand off	c. Waiting for channel allocation	d. None of the above	a
7	Dwell time depends upon		a. Interference	b. Distance between the subscriber and the base station	c. Propagation of call	d. All of the above	d

8	Mobile Assisted Handoff (MAHO) provides		a. Faster handoffs	b. Suitability for frequent handoffs	c. MSC need not monitor the signal strength	d. All of the above	d
9	Co- channel reuse ratio depends upon		a. Radius of the cell	b. Distance between the centers of the co channel cells	c. Frequency allocation of nearest cells	d. Both a) and b)	d
10	Interference in frequency bands may lead to		a. Cross talk	b. Missed calls	c. Blocked calls	d. All of the above	d
					s		

This sheet is for 2 Mark questions							
S.r No	Question	Image	a	b	c	d	Correct Answer
1	Radio capacity may be increased in cellular concept by		a. Increase in radio spectrum	b. Increasing the number of base stations & reusing the channels	c. Both a & b	d. None of the above	b
2	Spectrum Efficiency of a cellular network is		a. The traffic carried by whole network	b. The traffic carried per cell divided by the bandwidth of the system and the area of a cell	c. Expressed in Erlang / MHz /km2	d. Both b and c	d
3	The advantage of using frequency reuse is		a. Increased capacity	b. Limited spectrum is required	c. Same spectrum may be allocated to other network	d. All of the above	d
4	The strategies acquired for channel assignment are		a. Fixed	b. Dynamic	c. Regular	d. Both a and b	d
5	The techniques used to improve the capacity of cellular systems are		a. Splitting	b. Sectoring	c. Coverage zone approach	d. All of the above	d
6	In spread spectrum technique, the multiple users are assigned with		a. Same spectrum and same PN code	b. Same spectrum and different PN code	c. Different spectrum and different PN code	d. Different spectrum and same PN code	b
7	Direct sequence spread spectrum demodulation uses		a. DPSK	b. FSK	c. ASK	d. QPSK	a

8	Fast hopping is		a. More than one frequency hop during each symbol	b. Hopping rate greater than or equal to information symbol rate	c. One or more symbols transmitted between frequency hops	d. Both a and b	d	
9	Pure ALOHA is a		a. Random access protocol	b. Scheduled access protocol	c. Hybrid access protocol	d. Demand access protocol	a	
10	The increase in number of users in PURE ALOHA causes		a. Increase in delay	b. Increase in probability of collision	c. Increase in spectrum	d. Both a and b	d	

This sheet is for 3 Mark questions							
S.r No	Question	Image	a	b	c	d	Correct Answer
1	If more number of cells are necessary in the frequency reuse distance, then the segmentation & dualization techniques get _____		**a.** united	**b.** divided	**c.** restricted	**d.** filtered	a
2	Which method of cellular network assists in minimizing the co-channel interference associated with the angle of degree?		**a.** Cell Splitting	**b.** Cell Sectoring	**c.** Cell Segmentation & Dualization	**d.** None of the above	b
3	Which effect is widespread in adjacent-channel interference especially after the reception of a weak signal by a mobile user from the base-station?		**a.** Near-far effect	**b.** Doppler's effect	**c.** Capture effect	**d.** Kendall effect	a
4	In a cellular telephone system, which type of interference results from imperfect design of filters in receivers by allowing nearby frequencies to enter the receiver?		**a.** Co-channel Interference	**b.** Adjacent-cha Interference	**c.** Both a and b	**d.** None of the above	b
5	Which antennas are used at the center of the cells for the system with hexagonal-shaped cells?		**a.** Omni-direct antennas	**b.** Sectored directional antennas	**c.** Both a and b	**d.** None of the above	a
6	If the system is designed with the usage of hexagonal-shaped cells, how are the base-stations located?		**a.** At the centre of cell	**b.** At the edge of cell	**c.** At the corner of the cell	**d.** All of the above	d
7	Which hand-off stage deals with the relinquishment of unnecessary frequency channels by keeping the availability for other mobile users?		**a.** Initialization	**b.** Resource Reservation	**c.** Call Execution	**d.** Call Completion	d

8	In cellular telephone network, which component controls the switching between public wireline telephone network and the base station of cells for supporting the different calls between landline to mobile, mobile to landline and mobile to mobile calls?		**a.** Electronic Switching Center (ESC)	**b.** A Cell Controller	**c.** Radio Transmitter & Receiver	**d.** A common communication protocol	a	
9	Which among the following represents the flawless hand-off with no perceivable interruption of service?		**a.** Hard hand-off	**b.** Soft hand-off	**c.** Intracell hand-off	**d.** Intercell hand-off	b	
10	Coherence time refers to		a. Time required to attain a call with the busy base station	b. Time required for synchronization between the transmitter and the receiver	c. Minimum time for change in magnitude and phase of the channel	d. None of the above	c	

This sheet is for 1 Mark questions							
S.r No	Question	Image	a	b	c	d	Correct Answer
1	_____ is a server problem of wireless networks using CDM		a. Hidden and Exposed Terminals.	b. Near and Far Terminals.	c. Open and Close Terminals.	d. First and Last terminals.	b
2	TDMA is a multiple access technique that has		a. Different users in different time slots	b. Each user is assigned unique frequency slots	c. Each user is assigned a unique code sequence	d. Each signal is modulated with frequency modulation technique	a
3	TDMA allows the user to have		a. Use of same frequency channel for same time slot	b. Use of same frequency channel for different time slot	c. Use of same time slot for different frequency channel	d. Use of different time slot for different frequency channels	b
4	GSM is an example of		a. TDMA cellular systems	b. FDMA cellular systems	c. CDMA cellular systems	d. SDMA cellular systems	a
5	Global Positioning System uses		a. CDMA	b. TDMA	c. SDMA	d. FDMA	a
6	The guard interval is provided in OFDM		a. To eliminate the need of pulse shaping filter	b. To eliminate ISI	c. High symbol rate	d. Both a and b	d
7	In DSSS the signal is recovered using		a. Low pass filter	b. High pass filter	c. Band pass filter	d. Band stop filter	c
8	Fast frequency hopping is		a. Several modulations per hop	b. Several modulations per symbol	c. Several symbols per modulation	d. None of the mentioned	d
9	In which technique is phase coherence hard to maintain?		a. Direct sequence	b. Frequency hopping	c. Direct sequence & Frequency hopping	d. None of the mentioned	b

10	The frequency hopping system uses _____ modulation scheme.		a. FSK	b. BPSK	c. MFSK	d. MPSK	c

This sheet is for 2 Mark questions							
S.r No	**Question**	**Image**	**a**	**b**	**c**	**d**	**Correct Answer**
1	Which filter is used to get the final FHSS signal?		**a.** Low pass filter	**b.** High pass filter	**c.** Band pass filter	**d.** Band stop filter	c
2	The minimum spacing between consecutive hop positions gives the		**a.** Minimum number of chips necessary	**b.** Maximum number of chips necessary	**c.** Chip rate	**d.** None of the mentioned	a
3	Which system allows larger processing gain?		**a.** Direct sequence	**b.** Frequency hopping	**c.** Direct sequence & Frequency hopping	**d.** None of the mentioned	b
4	Spread spectrum makes _____ difficult.		**a.** Jamming	**b.** Interception	**c.** Jamming & Interception	**d.** None of the mentioned	c
5	Spread spectrum has immunity from		**1.** Noise	**2.** Multi-path distortion	**3.** Noise & Multi-path distortion	**4.** None of the mentioned	c
6	Frequency hopping system can provide reliable mitigation only if		**a.** Hopping rate is greater than the symbol rate	**b.** Hopping bandwidth is large	**c.** Hopping rate is greater than the symbol rate & its bandwidth is	**d.** None of the mentioned	c
7	For QAM, a “constellation diagram” shows:		a. location of symbols in “symbol space”	b. separation of symbols in “symbol space”	c. effects of noise on symbols	d. all of the above	d
8	For QAM, the two dimensions of its symbol space are:		a. amplitude and frequency	b. amplitude and phase angle	c. frequency and phase angle	d. I-bits and Q-bits	b
9	**QPSK is a modulation scheme where each symbol consists of**		a. 4 bits	b. 2 bits	c. 1 bit	d. M number of bits, depending upon the requirement	b
10	**The data rate of QPSK is _____ of BPSK.**		a. Thrice	b. Four times	c. Twice	d. same	c

This sheet is for 3 Mark questions							
S.r No	Question	Image	a	b	c	d	Correct Answer
1	What is the size of MAC Address?		a. 48 bits	b. 16 bits	c. 32 bits	d. 8 bits	a
2	The guard interval is provided in OFDM		a. To eliminate the need of	b. To eliminate	c. High symbol rate	d. Both a) and b)	d
3	The increase in number of users in PURE ALOHA causes		a. Increase in delay	b. Increase in probability of collision	c. Increase in spectrum	d. Both a) and b)	d
4	TDMA is used instead of TDM when:		a. all the signals come from the same source	b. the signals come from different sources	c. TDM is used in RF communications	d. they mean the same thing	b
5	When calculating the maximum number of users, a limiting factor in FDM is:		a. the type of media used	b. the length of the channel	c. the bandwidth of each signal	d. all of the above	c
6	Spread-spectrum can be done by using:		a. computer-controlled frequency reuse	b. frequency-hopping	c. direct-sequence method	d. all of the above	d
7	For a given data rate, direct-sequence systems, compared to standard RF systems, use:		a. about the same bandwidth	b. much more bandwidth	c. much less bandwidth	d. approximately double the bandwidth	b
8	A receiver for frequency-hopping spread-spectrum would be:		a. a narrowband receiver	b. a wideband receiver	c. a direct-conversion receiver	d. a CDMA receiver	a
9	CDMA:		a. cannot be used with frequency-hopping spread-spectrum	b. cannot be used with direct-sequence spread-spectrum	c. cannot be used on an RF channel	d. allows many transmitters to use a band simultaneously	d

10	For optimal performance, CDMA requires the use of:		a. orthogonal PN sequences	b. non-orthogonal PN sequences	c. true-random PN sequences	d. none of the above	a	

This sheet is for 1 Mark questions							
S.r No	**Question**	**Image**	**a**	**b**	**c**	**d**	**Correct Answer**
1	What are the three main parts of a GSM Architecture or Structure?		a. Mobile Station	b. BSS - Base Station Subsystem	c. NSS - Network and Switching Subsystem	d. All the above	d
2	What are the main parts of a Mobile Station in a GSM Network?		a. MT - Mobile Terminal	b. SIM - Subscriber Identity Module	c. Both A and B	d. None	c
3	What are the main parts of a BSS (Base Station Subsystem) in a GSM network?		a. BTS - Base Transceiver Station	b. BSC - Base Station Controller	c. A and B	d. None	c
4	Each Mobile Terminal is identified by a unique _____ number?		a. IMEI	b. SIM	c. IMSI	d. None	a
5	Each SIM is identified by a unique _____ number?		a. IMSI	b. IMEI	c. MSDN	d. None	a
6	Your mobile number is actually called _____ number.		a. IMSI	b. SIM	c. MSISDN	d. None	c
7	IMSI number of a SIM is also called?		a. MSISDN	b. IMEI	c. ICCID	d. None	a
8	What is PUK code of a SIM?		a. PIN Unlock Key	b. 4 digit code	c. It is like a password to enter after inserting SIM in a mobile for the first time. It prevents misuse.	d. All	d
9	What is the maximum number of Transceivers a BTS can handle is ?		a. 8	b. 12	c. 16	d. 22	c
10	What are the functions of a BSC?		a. Handovers, exchange functions	b. Frequency hopping	c. Control of radio frequency power level of BTS	d. All	d

This sheet is for 2 Mark questions							
S.r No	Question	Image	a	b	c	d	Correct Answer
1	Each cell in a GSM network has ?		a. Cell number	b. Cell Global number	c. Cell Global Identity number	d. None	c
2	A group of cells in a GSM network has a _____ number.		a. Location number	b. Location Area number	c. Location Area Identity number	d. None	c
3	Power control feature in a GSM network works on the _____ side?		a. Mobile side	b. BTS side	c. Both Mobile side and BTS side	d. None	c
4	Discontinuous Reception in a GSM network is aimed at saving _____ power.		a. BTS	b. BSC	c. Mobile Station	d. None	c
5	Discontinuous Reception is implemented with _____ in a GSM network.		a. Sideband channel	b. Pilot channel	c. Paging channel Sub channels	d. None	c
6	What is the duration of a GSM TDMA Frame?		a. 4.614ms	b. 5.614ms	c. 6.614ms	d. None	a
7	What are the types of Logical channels in a GSM Structure or Architecture?		a. Traffic channels	b. Broadcasting channels	c. Common control channels, Dedicated control channels	d. All	d
8	Majority of the GSM Channels work on _____ interface?		a. Abis interface	b. A interface	c. Um interface	d. M interface	c
9	Choose a Broadcast channel in GSM Architecture?		a. BCCH (Broadcast Control Channel)	b. FCCH (Frequency Correction Channel)	c. SCH (Synchronization Channel), CBCH (Cell Broadcast Channel)	d. All	d
10	What is TRUE about a SCH channel of GSM Architecture?		a. It carries Time Synchronization data	b. It contains BSIC (Base Station Identity Code)	c. It contains TDMA Frame number	d. All	d

This sheet is for 3 Mark questions							
S.r No	Question	Image	a	b	c	d	Correct Answer
1	Which technique of GSM Architecture tells the mobile to advance it's transmission bursts (data) so that overlap with other bursts may be avoided at channel?		a. DTX	b. TA - Timing Advance	c. Power Control	d. None	b
2	What is the total number of Carrier Frequencies that can be formed in a 25MHz band width of either Uplink or Downlink of GSM?		a. 128	b. 126	c. 124	d. None	c
3	What is the data rate or speed offered by a GPRS connection?		a. 56-115kbps	b. 9-256kbps	c. 64-128kbps	d. None	a
4	GPRS uses which unused channels for transportation of Data in general?		a. SDCCH	b. BCCH	c. TCH	d. SCH	c
5	In a GPRS network, SGSN is the equivalent of _____ system in GSM.		a. BSC	b. MSC	c. VLR	d. GMSC	b
6	GPRS Roaming from one SGSN to another SGSN is offered by ?		a. GMSC	b. GGSN	c. HLR	d. VLR	b
7	A GPRS network contains Firewalls to _____?		a. Hack phones	b. Intercept phones	c. Protection from Virus	d. None	c
8	A GPRS Network is a part of ____ in GSM network.		a. BTS	b. BSS	c. NSS	d. VLR	c
9	Which is the main protocol that transfers packets in a GPRS Core network?		a. GTP	b. SSTP	c. SCTP	d. None	a
10	What is the interface between GGSN and External Packet Network(Internet) in a GPRS structure?		a. Gs	b. Gn	c. Gi	d. Gp	c

This sheet is for 1 Mark questions							
S.r No	**Question**	**Image**	**a**	**b**	**c**	**d**	**Correct Answer**
1	EDGE stands for?		a. Enhanced Data Rate for GSM Evolution	b. Enhanced Data for GSM	c. Enhanced Data for GSM Enhanced	d. None of the above	a
2	3GPP stands for ____?		a. 3rd Generation Pulse Project	b. 3rd Generation Partnership Project	c. 3rd Generation Protocols Project	d. None	b
3	What is the modulation technique used by WCDMA technology?		a. Amplitude Modulation	b. Separate Spectrum Modulation	c. Spread Spectrum Modulation	d. None	d
4	What is the Code name for CDMA2000 1xEV-DO?		a. IS-95	b. IS-2000	c. IS-856	d. None	c
5	EV-DV stands for ___.		a. Evolution-Data Variable	b. Evolution-Data Versatile	c. Evolution Data and Voice	d. Enhanced Data and Voice	c
6	What is the Multiplexing technique followed by an 1xEV-DO network?		a. FDM (Frequency Division Multiplexing)	b. PDM (Phase Divisi on Multiplexing)	c. TDM (Time Division Multiplexing)	d. None	c
7	A Virtual Soft Handoff in a 1xEVDO system works in ___ way.		a. Forward	b. Reverse	c. Both Forward and Reverse	d. None	a
8	What are the handoffs implemented in a CDMA2000 1x network?		a. Soft Forward and Soft Reverse handoffs	b. Hard Forward and Hard Reverse Handoffs	c. Both A and B	d. None	c
9	Choose a correct statement about CDMA2000 1x network.		a. It uses Convolution Code	b. It uses Turbo Code	c. It uses 48 Order FIR filter.	d. All	d

10	What are the Handoffs implemented in a CDMA2000 1x-EV-DO network?		a. Forward Virtual Soft Handoff	b. Reverse Soft Handoff	c. A and B	d. None	c

This sheet is for 2 Mark questions							
S.r No	Question	Image	a	b	c	d	Correct Answer
1	EDGE services are considered as _____ generation services.		a. 2G	b. 2.5G	c. 3G	d. None of the above	a
2	What is the maximum data rate supported by a 3G network or UMTS network?		a. 384 kbps	b. 2 Mbps	c. 32 Mbps	d. 42 Mbps	d
3	CDMA2000 technology is also a ___ network.		a. 2G	b. 3G	c. 4G	d. None	b
4	Most of the CDMA2000 (IS-2000) channels and functionalities are similar to ___.		a. IS-95	b. EVDO-95	c. UMTS	d. WCDMA	a
5	What does EVDO stand for in a CDMA2000 1x network?		a. Evolved Variable Data Optimized	b. Evolution-Data Optimized	c. Enhanced Data Optimized	d. None	b
6	CDMA 1x Ev-DO is a successor to ____.		a. CDMAOne	b. CDMA2000 1x	c. CDMA IS-95	d. None	b
7	What does CDMA2000 1x provides?		a. Voice	b. Data	c. Voice and Data	d. None	c
8	What is the basic data rate (Minimum data rate) in an EV-DO network?		a. 32 Kbps	b. 38.4 Kbps	c. 56 Kbps	d. 64 Kbps	b
9	In an EVDO network, all users of the same Sector share ___ in a TDMA mode.		a. Channel	b. Frequency	c. Code	d. None	a

10	CDMA2000 1xEV-DO follows ___ power control for Reverse channels.		a. Fixed	b. Dynamic	c. No power control	d. -	b	

This sheet is for 3 Mark questions							
S.r No	Question	Image	a	b	c	d	Correct Answer
1	What is the interface between NodeB and RNC in a WCDMA network?		a. Lub	b. Luc	c. Lud	d. Lue	a
2	Which is the technology used by WCDMA to transfer data packets in its RAN network (Air Interface + Nodeb.?		a. IP	b. Frame Relay	c. ATM (Asynchronous Transfer Mode)	d. None	c
3	Identify CDMA Forward Channels below.		a. F-PICH (Forward Pilot Channel)	b. F-PCH (Forward Paging Channel)	c. F-SYNCH (Forward Sync Channel)	d. All the above	d
4	Identify CDMA Reverse Channels below.		a. R-SCH (Reverse Supplemental Channel)	b. R-SCCH (Reverse Supplemental Code Channel)	c. R-PCSCH (Reverse Power Control Sub-Channel)	d. All the above	d
5	Which technology among the following offers High-Speed Packet Data?		a. CDMAOne	b. CDMA2000 1x	c. CDMA 1xEV	d. None	c
6	What is the Channel bandwidth of an EV-DO carrier?		a. 1 MHz	b. 1.25 MHz	c. 5 MHz	d. None	b
7	An EV-DO carrier has the same bandwidth of ____.		a. IS-95A CDMA	b. IS-2000 1xRTT	c. IS-95A and IS-2000 1xRTT	d. None	c
8	A CDMA2000 1xEV-DO offers data services through ___ switching.		a. Circuit Switching	b. Packet Switching	c. Circuit and Packet Switching	d. None	b

9	High Rate Packet Data Access (HRPDa. of a EV-DO Rev-A provided good data rates due to _____ techniques.		a. Spread Carrier	b. Mobility Managemen t	c. Both SC (Spread Carrier) and MM (Mobility Management)	d. None	c	
10	In a CDMA2000 1xEV-DO network, Forward channels always transmit at ____ power.		a. Half power	b. Variable Power	c. Full Power	d. None	c	

This sheet is for 1 Mark questions							
S.r No	Question	Image	a	b	c	d	correct answer
1	What is the Access technique used by an LTE or LTE-A network?		A) WCDMA	B) FDMA	C) PDMA	D) OFDMA	d
2	What is the main way we interact with technology currently?		a. A Keyboard	b. Voice	c. Eyes	d. Thoughts	a
3	How do most people use AR currently?		a. Their computers	b.Their phones	c. Their TV's	d. AR Goggles	b
4	What does 5G stand for?		a.The fifth generation of mobile device technology.	b. The fifth generation of wireless network technology.	c. The fifth generation of data processing techology.	d. None of these	b
5	_____ is the foundation of our 4G LTE network.		a. 600MHz	b. 800MHz	c. 700MHz	d. None of these	a
6	Which of the following is NOT a constraint of VR?		a. It can only be used for Science and Geography	b. It can be costly	c. Developing lessons/ experiences can be time consuming	d.Resistance to new technology from teachers	a
7	What are the 3 types of VR?		a. Immersive, 3D, non-immersive	b. Immersive, semi-immersive, non-immersive	c. Digital, semi-immersive, projective	d. 3D, non-immersive, digital	b
8	Difference between VR and AR		a. VR adds to your vision | AR replaces it	b. VR is real world | AR is virtual environment	c.VR is like YouTube | AR is like African Technology	d.VR replaces your vision | AR adds to it	d
9	What does AR stand for?		a. Augmented Realistic	b. Armed Reindeers	c. Augmented Reality	d. Augmented Real	c

10	What is VR NOT used for?		a. Video Games	b. Military Training	c.Flight Simulation	d.Swimming Goggles	d

This sheet is for 2 Mark questions							
S.r No	Question	Image	a	b	c	d	correct answer
1	What is the other name for a 3GPP2 based 4G network?		A) Super Mobile Broadband (SMB)	B) Advanced Mobile Broadband (AMB)	C) Ultra Mobile Broadband (UMB)	D) None	c
2	This game launched augmented reality (AR) into the spotlight in recent years...		a. Super Mario	b. Pokemon	cWorld of Warcraft	d.Fortnite	b
3	Augmented reality (AR) provides features that are...		a. Visual, interactive, and 3D	b. Collaborative, virtual, and simulated	c. Computer-generated, sensory, and virtual	d. Sounds, sensory, and cost-efficient	a
4	Which definition best fits "Augmented Reality"?		a. Technology that turns physical objects into digital objects	b. Technology that overlays digital information on top of real world items	c. Technology that puts users in a new digital environment	d. Technology that can achieve a human-level understanding of images	b
5	AR technology allows students to interact with the physical world by _____.		a. Moving around to change perspectives	b. Moving closer/further to change scale	c. Select virtual objects by pointing to them	d. All of the above	d
6	What group was one of the first to start using Augmented Reality?		a. Doctors	b. The Military	c.Businessmen	d. Engineers	b
7	What is AR?		a. When environment is fully computer generated	b. Users immersed in virtual environment	c. A type of video camera	d. A reindeer stuck in a bucket	a
8	Mixed Reality is _____.		a. curve fitting	b. When virtual object overlaid on real-world environment	c. When virtual world combined with real- world	d. All of the above	c

9	Which of the following is a characteristic of Virtual Reality?		a. Simulates complete or partial real-world experience	b. Created by a computer	c. Stimulates senses like sight, hearing, and touch	d. All of the answers are correct.	d
10	Which one of the senses does not applied in Virtual Reality?		a. Sound	b. Vision	c. Touch	d. Taste	d

This sheet is for 3 Mark questions							
S.r No	Question	Image	a	b	c	d	correct answer
1	How will we interact with technology in the future?		a. A Keyboard	b. Voice	c. Eyes	d. Thoughts	d
2	An example of non-immersive VR device is		a. An IMAX	b. An iPad	c. A virtual reality headset	d. A screen projection	b
3	Virtual Reality		a. places the experiencer in another location entirely. Whether that location has been generated by a computer or captured by video, it entirely occludes the experiencer's natural surroundings.	b.is the view that is visible to the experiencer while rotating their head from a fixed body position. The average human field of view is approximately 200 degrees.	c. Anything related to or that will impact the user's attitude or emotions for a product, system or service.	d. a set of goggles or a helmet with tiny monitors in front of each eye to generate images seen by the wearer as three-dimensional	a
4	Which definition best fits "Augmented Reality"?		a. Technology that turns physical objects into digital objects	b. Technology that overlays digital information on top of real world items	c. Technology that completely immerses users in a new digital environment	d. Technology that can achieve a human-level understanding of images	b
5	Virtual Reality		a. An open-source operating system for mobile devices created by Google	b. Images, videos, animations or even 3D models that appear whenever Cospaces sees an image that it recognises	c. The computer-generated simulation of a three-dimensional image or environment that can be interacted with in a seemingly real or physical way by a person using special electronic equipment, such as the Oculus Rift	d. An image or graphic superimposed over an Image Target	c

Unit 1: Introduction to Cellular Networks

Q1. 1G or First Generation Mobile Network is____?

A) Analog
B) Digital
C) Sequential
D) Fuzzy

Correct Answer – A

1G is analog. 2G is digital.

Q2. In a 1G network, the type of communication between Tower to BTS and Switching Center is _____?
A) Analog
B) Digital
C) Discrete
D) Diminished
Answer: B
Digital

Q3. What are main problems in 1G technology?
A) Noise
B) Security
C) Poor Battery backup
D) All the above

Answer: D

Noise, Security, Poor Battery Backup

Q4. What is the Cell Size or Coverage Area in 1G technology?
A) 1-5Km
B) 20-60Km
C) 5-50Km
D) 2-30Km
Answer: D
2-30 Km
Explanation: 1G network covers a lot of area. With less number of towers or BTS, you can achieve robust coverage.

5. Which of the following is supported data rates of 4G Networks?

a. 1024kbps
b. 100mbs

c. 200mbps

d. None of the above

Answer: b

Explanation: The rate of data transfer or speed of the 4G network is approximately 100mbps, which is 20 times faster than that of 3G networks. The maximum speed of the 4g network is about 300mbps or more, but such speed is only achievable in well-controlled laboratory environments. So the correct answer will be B.

6. When was the 2G communication introduced in the market?

a. 1982

b. 1984

c. 1986

d. 1988

Answer: d

Explanation: The 2G communication was first launched in early 1988 in the market. So the correct answer is D.

7. PCS/PCN provides only wired communication.
a) True
b) False

Answer: b
Explanation: The objective of personal communication systems (PCS) or personal communication networks (PCNs) is to provide ubiquitous wireless communications coverage, enabling users to access telephone network and Internet.

8. Concept of PCS/PCN is based on _____
a) Advanced intelligent network
b) Artificial intelligent network
c) CDPD
d) SS7

Answer: a
Explanation: The concept of PCS/PCN is based on an advanced intelligent network (AIN). The mobile and fixed networks will be integrated to provide universal access to the network and its databases.

9. Circuit switching has more advantage than packet switching for PCS.
a) True
b) False

Answer: b
Explanation: Packet switching technology will have more advantages for PCS/PCN than circuit switching. PCS is required to serve a wide range of services including voice, data, e-mail and digital video.

10._____ is used for transmission of packets in the cellular switched architecture.
a) Packet switching techniques
b) Circuit switching techniques
c) Packet and circuit switched technique
d) Datagram technique

Answer: a
Explanation: Packet switching techniques are used for transmission of packets in the cellular switched architecture. Packet switching is attractive for wireless networks because the addresses and other information in packet headers make it possible for dispersed network elements to respond to a mobile user without intervention central controllers.

11. The 2G cellular network uses
a. TDMA/FDD
b. CDMA/FDD
c. Digital modulation formats
d. All of the above
ANSWER: All of the above

12. 2G standards support
a. Limited internet browsing
b. Short Messaging Service
c. Both a & b
d. None of the above
ANSWER: Both a & b

13. The shape of the cellular region for maximum radio coverage is
a. Circular
b. Square
c. Oval
d. Hexagon
ANSWER: Hexagon

14. Hexagon shape is used for radio coverage for a cell because
a. It uses the maximum area for coverage
b. Fewer number of cells are required
c. It approximates circular radiation pattern
d. All of the above
ANSWER: All of the above

15. The process of transferring a mobile station from one base station to another is
a. MSC
b. Roamer
c. Hand off
d. Forward channel
ANSWER: Hand off

16. Which of the following memory device stores information such as subscriber's identification number in GSM?
a) Register
b) Flip flop
c) SIM
d) SMS

Answer: c
Explanation: SIM (subscriber identity module) is a memory device that stores information such as the subscriber's identification number, the networks and countries where the subscriber is entitled to service, privacy keys, and other user specific information.

17. Which of the following subsystem provides radio transmission between mobile station and MSC?
a) BSS
b) NSS
c) OSS
d) BSC

Answer: a
Explanation: The BSS provides and manages radio transmission paths between the mobile stations and the Mobile Switching Center (MSC). It also manages the radio interface between the mobile stations and all other subsystems of GSM.

18. _____ manages the switching function in GSM.
a) BSS
b) NSS
c) OSS
d) MSC

Answer: b
Explanation: NSS (Network and Switching Subsystem) manages the switching functions of the system. It allows the MSCs to communicate with other networks such as PSTN and ISDN.

19) What are the three main parts of a GSM Architecture or Structure?
A) Mobile Station
B) BSS - Base Station Subsystem
C) NSS - Network and Switching Subsystem
D) All the above
Answer: D

20) What are the main parts of a Mobile Station in a GSM Network?
A) ME - Mobile Equipment (ME)
B) SIM - Subscriber Identity Module
C) Both A and B
D) None
Answer: C

21) What are the main parts of a BSS (Base Station Subsystem) in a GSM network?
A) BTS - Base Transceiver Station
B) BSC - Base Station Controller
C) A and B
D) None
Answer: C

22) What are the main parts of an MSC (Mobile Switching Centre) system in a GSM structure?

A) MGW - Media Gateway

B) MSC Server

C) Both A and B

D) None

Answer: C

Explanation: Draft the function of system of call and the commutation, the advance of call, the information of invoicing and the collection of base

23) What is the name of the database that stores subscriber information under an MSC and his eligible services?
A) MSC
B) HLR
C) EIR
D) AUC
Answer: B

Explanation: HLR also stores the location of a customer.

24) What is the name of a database used mainly that stores information of a subscriber along with eligible services under roaming or another MSC area?
A) HLR
B) VLR
C) EIR
D) AUC
Answer: B

Explanation: A visitor location register (VLR) is a server in a cellular network that supports roaming functions for users outside the coverage area of their own HLR.

25) Covering area of an MSC is also called ____ ?
A) VLR
B) HLR
C) EIR
D) AUC
Answer: B

26. Which of the following stores all the user-related data that is relevant for the GSM system in mobile computing?

1. SIM
2. HLR
3. ELR
4. VLR

Answer: 1

Explanation: Subscriber Identity Module stores all customer related information.

27. Which of the following stores Mobile Subscriber ISDN number – MSISDN?

1. Home location register
2. Visitor location register
3. Entity equipment register
4. None of the above

Answer 1

28. The base station covers a specific area that is called a ——

1. Cell
2. Tessellate
3. Mobile station
4. None of the above

Answer 1

Explanation: A mobile phone **base station** provides coverage to a geographic **area** known as a “cell”. Cells are aligned next to each other in a similar pattern to a honeycomb, and it is for this reason that mobile phone networks are sometimes referred to as “cellular” networks.

29. In a cellular system, the shape of the cell depends on —–

1. Environmental conditions
2. Social conditions
3. Political conditions
4. None of the above

Answer: 1

30. _____ is defined as the ratio of desired signal power to undesired noise power.
a) Signal to noise ratio
b) Noise to signal ratio
c) Noise figure
d) Noise temperature

Answer: a
Explanation: SNR is defined as the ratio of desired signal power to undesired noise power, and so is dependent on the signal power. When noise and a desired signal are applied to the input of a noise less network, both noise and signal will be attenuated or amplified by the same factor, so that the signal to noise ratio will be unchanged.

31. _____ is defined as the ratio of input signal to noise ratio to the output signal to noise ratio.
a) Noise figure
b) Noise temperature
c) SNRo
d) None of the mentioned

Answer: a

Explanation: Noise figure is defined as the ratio of input signal to noise ratio to the output signal to noise ratio of a system or a receiver. SNR_i is the signal to noise ratio measured at the input terminals of the device. SNR_0 is the output signal to noise ratio measured at the output terminals of the device.

Q32. The broad spectrum of the transmitted signal gives rise to
a). Fading
b). Noise
c). Spread Spectrum
d). All of the above
Answer: C

Explanation: **spread-spectrum** techniques are methods by which a signal (e.g., an electrical, electromagnetic, or acoustic signal) generated with a particular bandwidth is deliberately **spread** in the frequency domain, resulting in a signal with a wider bandwidth.

Q33. What is channel assignment?

a) For efficient utilization of radio spectrum a frequency reuse scheme with increasing capacity and minimizing interference is required.
b) For efficient utilization of radio spectrum a frequency reuse scheme with increasing capacity and maximizing interference is required.
c) a & b
d) None of the above

Answer: A

Explanation: Channel Allocation means to allocate the available **channels** to the cells in a **cellular** system. ... **Channel Allocation** Strategies are designed in such a way that there is efficient use of frequencies, time slots and bandwidth.

34. _____ leads to time dispersion and frequency selective fading.
a) Doppler spread
b) Multipath delay spread
c) Time dispersive parameters
d) Frequency delay spread

Answer: b
Explanation: Multipath delay spread leads to time dispersion and frequency selective fading. Doppler spread leads to frequency dispersion and time selective fading. These two propagation mechanism are independent of each other.

35. Which of the following is not a characteristic of flat fading?
a) Mobile radio channel has constant gain
b) Linear phase response
c) Non-linear phase response
d) Bandwidth is greater than the bandwidth of transmitted signal

Answer: c
Explanation: The received signal will undergo flat fading if mobile radio channel has a constant gain and linear phase response over a bandwidth which is greater than the bandwidth of transmitted signal. It is the most common type of fading.

36. Spectral characteristics of the channel changes with time in flat fading.
a) True
b) False

Answer: b
Explanation: In flat fading, the multipath structure of the channel is such that spectral characteristics of the transmitted signal are preserved at the receiver. But, the strength of the received signal changes with time due to fluctuations in the gain of channel caused by multipath.

37. Flat fading channel is also known as _____
a) Amplitude varying channel
b) Wideband channel
c) Phase varying channel
d) Frequency varying channel

Answer: a
Explanation: Flat fading channel is also known as amplitude varying channel. They are also sometimes referred to as narrowband channel. In flat fading channel, the bandwidth of the applied signal is narrow as compared to the channel flat fading bandwidth.

38. The GSM technology uses a combination of … multiplexing techniques.
A. FDMA and TDMA
B. SDMA and TDMA
C. FDMA and CDMA

Answer: A

GSM uses TDMA and **FDMA** for user and cell separation

39. GSM system consists of the … administrative region assigned to one mobile switching centre.
A. minimum one
B. maximum one
C. minimum two
D. maximum two

Answer: A

GSM System Hierarchy consists at the minimum one administrative region assigned to one MSC (Mobile Switching Centre)

40. The … includes Mobile Equipment (ME) and the Subscriber Identity Module (SIM).
A. Base Station Subsystem (BSS)
B. Base Station Controller (BSC)

C. Mobile Station (MS)
D. Mobile Switching Centre (MSC)

Answer: C

Mobile Station in GSM consist of ME and SIM.

41) The advantages of FDMA over TDMA includes
1. Division is simpler
2. Propagation delays are eliminated
3. Cheaper filters with less complicated logic functions
4. Linearity

a. 1, 2 and 3 are correct
b. 1 and 2 are correct
c. 1 and 4 are correct
d. All four are correct
ANSWER: 1 and 2 are correct

42. Which of the following statement is defined as line of sight distance?
a) Distance covered by a direct space wave from transmitting to receiving antenna
b) Distance covered by an indirect space wave from transmitting to receiving antenna
c) Distance covered by a direct sky wave from transmitting to receiving antenna
d) Distance covered by an indirect sky wave from transmitting to receiving antenna

Answer: a
Explanation: LOS (Line of sight) is defined for space wave propagation. It is the distance covered by a direct space wave from transmitting to receiving antenna. It depends on the height of the transmitting and receiving antennas and effective earth's radius factor k.

43. On which of the following factors does the LOS distance depends?
a) Height of receiving antenna alone
b) Height of transmitting antenna alone
c) Only on height of transmitting and receiving antenna
d) On height of transmitting and receiving antenna and effective earths radius factor k

Answer:d
Explanation: LOS (Line of sight) is the distance covered by a direct space wave from transmitting to receiving antenna. The LS distance depends on the effective earth's radius factor k and height of the transmitting and receiving antennas. The LOS distance is given by d=4.12(ht−−√+hr−−√) in km.

44. Signals with a frequency propagation above 30MHz use __ transmission

A. ground

B. sky

C. line-of-sight

D. none of the above

Answer: C

45. The MSC with an interface to other network like Public Switched Telephone (PSTN) is called ____ .

A. Gateway main switching centre.

B. Main Switching Centre

C. Base Station Subsystem

D. Base Transceiver Station

Answer: A

The MSC with an interface to other network like Public Switched Telephone (PSTN) is called gateway main switching centre.

46. _____ has a function to authenticate each SIM card that attempts to connect to the GSM core network.

A. Authentication centre (AUC)

B. Equipment Identity Register

C. Subscriber Identity Module (SIM)

D. Base Station Controller (BSC)

Answer: A

AUC look after not in favour of robber or thief during air interface. It keeps the authentication keys and granted the security triplets. It is normally linked with the HLR.

47. BSS consists of following elements.

A. One BTS, Two BSC, Two TRAU (Transcoding Rate and Adaptation Unit)
B. One or more BTS, Two BSC, One TRAU (Transcoding Rate and Adaptation Unit)
C. One or more BTS, One BSC, One TRAU (Transcoding Rate and Adaptation Unit)
D. One BTS, One or more BSC, One TRAU (Transcoding Rate and Adaptation Unit)
Answer: C

Explanation: With air interface BSS provides MS and NSS (Network Station Subsystem). BSS consists of following elements.

- One or more BTS
- One BSC
- One TRAU (Transcoding Rate and Adaptation Unit)

48. Radio Uplink transmission path from?
A. HLR to VLR
B. Mobile Station (Cell Phone) to a Base Station (Cell Site)
C.BSC to BSS
D.SIM to ME
Answer: B
Explanation: The radio uplink is the transmission path from the Mobile Station (Cell Phone) to a Base Station (Cell Site).

49. Path loss in free space model is defined as difference of _____
a) Effective transmitted power and gain
b) Effective received power and distance between T-R
c) Gain and received power
d) Effective transmitter power and receiver power

Answer: d
Explanation: I Path loss is defined as difference of effective transmitter power and receiver power. Free-space path loss is the loss in signal strength of an electromagnetic wave that would result from a line-of-sight path through free space, with no obstacles nearby to cause reflection or diffraction.

50. Fading is caused due to

1. Multi path propagation
2. Obstacles
3. Frequency variations at the source
4. Variation in amplitude and phase at receiver

a. 1) and 2) are correct
b. 1), 2) and 4) are correct
c. 2) and 3) are correct
d. All are correct

ANSWER: b. 1), 2) and 4) are correct

Explanation: Fading can be either due to multipath, called as **multipath fading** or due to **shadowing** from obstacles affecting the wave propagation

UNIT 2 MOBILE COMMUNICATION MCQ

1. What is frequency reuse?
   a) Process of selecting and allocating channels
   b) Process of selection of mobile users
   c) Process of selecting frequency of mobile equipment
   d) Process of selection of number of cells

Answer: a

2. Which of the following is a universally adopted shape of cell?
   a) Square
   b) Circle
   c) Triangle
   d) Hexagon

Answer: d

3. Capacity of a cellular system is directly proportional to _____
   a) Number of cells
   b) Number of times a cluster is replicated
   c) Number of Base stations
   d) Number of users

Answer: b

4. In fixed channel assignment strategy, each cell is allocated a predetermined set of _____
   a) Voice channels
   b) Control channels
   c) Frequency
   d) base stations

Answer: a

5. What is a borrowing strategy in fixed channel assignments?
   a) Borrowing channels from neighbouring cell
   b) Borrowing channels from neighbouring cluster
   c) Borrowing channels from same cell
   d) Borrowing channels from other base station in same cell

Answer: a

6. In dynamic channel assignment strategy, base station requests channel from _____
   a) MSC
   b) Neighbouring cell

c) Neighbouring cluster
d) Neighbouring base station

Answer: a

7. What is the condition for handoff?
   a) A mobile moves into a different cell while in conversation
   b) A mobile remains in the same cell while in conversation
   c) A mobile moves to different cell when idle
   d) A mobile remains in the same cell and is idle

Answer: a

8. The time over which a call can be maintained within a cell without handoff is called _____
   a) Run time
   b) Peak time
   c) Dwell time
   d) Cell time

Answer: c

9. Which of the following is associated with the handoff in first generation analog cellular systems?
   a) Locator receiver
   b) MAHO
   c) Cell dragging
   d) Breathing cell

Answer: a

10. A handoff is initiated when the power received from the base station of a neighbouring cell falls behind the power received from the current base station by certain level.
   a) True
   b) False

Answer: b

11. What is the condition for intersystem interference?
   a) Mobile moves from one cell to another cell
   b) Mobile remains in the same cell
   c) Mobile moves from one cellular system to another cellular system
   d) Mobile remains in the same cluster

Answer: c

12. Umbrella cell approach is possible by using _____
   a) Antenna of same heights

b) Antenna of different heights
c) Different voice channels
d) Different control channels

Answer: b

13. Soft handoff is also known as _____
a) MAHO
b) Hand over
c) Break before make
d) Make before break

Answer: d

14. The process of transferring a mobile station from one base station to another is

a. MSC
b. Roamer
c. Hand off
d. Forward channel

ANSWER: c

15. Hexagon shape is used for radio coverage for a cell because

a. It uses the maximum area for coverage
b. Fewer number of cells are required
c. It approximates circular radiation pattern
d. All of the above

Answer : d

16. In which one of the following codes with specific characteristics can be applied to the transmission?

a) VLR
b) HMR
c) CMR
d) SIM

Answer: d

17. Which of the following offers packet mode data transfer service over the cellular network?

a. TCP

b. GPRS
c. GSM
d. None of the above

Answer: b

18. Which one of the following enables us to use the entire bandwidth simultaneously?

a. TDMA
b. CDMA
c. FDMA
d. All of the above

Answer: b

19. In a Cellular network, which of the following is used to use the same frequency for others?

a. Frequency hopping
b. Frequency reuse
c. Frequency planning
d. None of the above

Answer: b

20. In general, a mobile computing environment can also be considered as the type of _____ environment.

a. Grid computing
b. Mobile computing
c. Distributed computing
d. None of the above

Answer: c

21. Which of the following is a fundamental principle of wireless communication?

a. Electromagnetic waves
b. Microwaves
c. Both A and B

d. None of the above

Answer: a

22. Which of the following is required to transmit the digital information using a certain frequency by translating it into an analog signal?

a. Demodulation
b. Modulation
c. QPSK
d. BSPK

Answer: b

23. How many types of security services are provided by the GSM?

a. 1
b. 2
c. 3
d. None of the above

Answer: c

24. In which one of the following, the early FM push to talk telephone system, was used?

a. Half Duplex
b. Full Duplex
c. Simple Duplex
d. None of the above

Answer: a

25. Which of the following statements about the Half Duplex is correct?

a. It is a type of communication in one direction
b. It is a type of communication in one direction at a time
c. It is a type of by directional communication at the same time
d. None of the above

Answer:b

26. Radio capacity may be increased in cellular by_____

a. Increase in the radio spectrum
b. Increasing the number of base stations & reusing the channels
c. None of the above
d. Both a & b

Answer: b

27. Commonly used mode for 3G networks is

a. TDMA
b. FDMA
c. TDD
d. FDD

ANSWER: d.

27. State whether True of False.
i) The cells or subdivisions of a geographical area are always hexagonal.
ii) A land to Mobile call originates through the Telephone exchange.

A) True, False
B) False, True
C) False, False
D) True, True

Answer : B

28. The basic GSM is based on _____ traffic channels.

A) connection oriented.
B) connection less.
C) packet switching.
D) circuit switching.

Answer : A

29. In ..... Frequency Spectrum is divided into smaller spectra and is allocated to each user.

A) TDMA
B) CDMA
C) FDMA
D) FGMA

Anwer : C

30. What are co-channel cells?

a) Cells having different base stations

b) Cells using different frequency

c) Cells using adjacent frequency

d) Cells using same frequency

Answer: d

31. Interference is more severe in rural areas.

a) True

b) False

Answer: a

32. Co-channel interference is a function of _____

a) Radius of cell

b) Transmitted power

c) Received power

d) Frequency of mobile user

Answer: a

33. What is breathing cell effect?

a) Fixed coverage region

b) Dynamic and time varying coverage region

c) Large coverage region

d) Very small coverage region

Answer: b

34. Which of the following problem occur due to adjacent channel interference?

a) Blocked calls

b) Cross talk

c) Near-far effect

d) Missed calls

Answer: c

35. Interference in frequency bands may lead to

a. Cross talk
b. Missed calls
c. Blocked calls
d. All of the above

ANSWER: d.

36. Co- channel reuse ratio depends upon

a. Radius of the cell
b. Distance between the centers of the co channel cells
c. Frequency allocation of nearest cells
d. Both a) and b)
e. Both b) and c)

ANSWER: d.

37. Which among the following represents the flawless hand-off with no perceivable interruption of service?

a. Hard hand-off

b. Soft hand-off

c. Intracell hand-off

d. Intercell hand-off

ANSWER: b

38. If the system is designed with the usage of hexagonal-shaped cells, how are the base-stations located?

a. At the centre of cell

b. At the edge of cell

c. At the corner of the cell

d. All of the above

ANSWER: d

39. Which method of cellular network assists in minimizing the co-channel interference associated with the angle of degree?

a. Cell Splitting

b. Cell Sectoring

c. Cell Segmentation & Dualization

d. None of the above

ANSWER: b

40. Which of the following does not come under the teleservices of GSM?

a) Standard mobile telephony

b) Mobile originated traffic

c) Base originated traffic

d) Packet switched traffic

Answer: d

41. Which of the following comes under supplementary ISDN services?

a) Emergency calling

b) Packet switched protocols

c) Call diversion

d) Standard mobile telephony

Answer: c

42. Which of the following feature makes impossible to eavesdrop on GSM radio transmission?

a) SIM

b) On the air privacy

c) SMS

d) Packet switched traffic

Answer: b

43. Which of the following does not come under subsystem of GSM architecture?

a) BSS

b) NSS

c) OSS

d) Channel

Answer: d

44. What is the abbreviation of CDMA?

A) Code Digital Multiple Access

B) Code Duplex Multiple Access

C) Code Division Multiple Access

D) None

Answer : C

45. The GSM technology uses a combination of … multiplexing techniques.

A. FDMA and TDMA

B. FDMA and TDMA

C. SDMA and TDMA

D. FDMA and CDMA

Answer : B

45. While handoffs, the termination of call may be avoided by

A Providing Guard channel
B Queuing of handoffs
C Both a & b
D None of the above

Answer: C

46. Umbrella cell approach

A Uses large and small cells
B Uses different antenna heights
C Is used for high speed users with large coverage area and low speed users with small coverage area
D All of the above

Answer: D

47. In time diversity

A Multiple versions of signals are transmitted at different time instants
B Signal is transmitted with different polarization
C The signal is transmitted using multiple channels
D All of the above

Answer: a

48. The main aim of the file system is to support_____

a. Transparent access to data
b. Efficient access to data
c. Consistent access to data
d. All of the above

Answer: d

49. One of the essential challenges of distributed systems apply to DFS is/are

a. Migration of data
b. Concurrent access to data
c. Replication of data
d. All of the above

Answer: d

50. Which of the following can be considered as the advantage of using frequency reuse?

a. The same spectrum can be allocated to the other networks
b. Only a limited spectrum is required
c. Increase capacity
d. All of the above

Answer: d

UNIT 3 MOBILE COMMUNICATION MCQ

Q1 : The field of the MAC frame that alerts the receiver and enables it synchronize is known as

a:SFD
b:preamble
c:source address
d:destination address

Ans: preamble

Q2 : Medium Access Control is the sub layer of

a:LLC
b:IEEE
c:ANSI
d:both a and c

Ans: IEEE

Q3 : The Medium Access Control layer frame has

a: 5 Fields

b: 7 Fields
c: 9 Fields
d: 11 Fields

Ans: 7 Fields

Q4 : The value of the frame body field of Medium Access Control frame is in between

a: 0 and 512 bytes
b: 0 and 1214 bytes
c: 0 and 2312 bytes
d: 0 and 3450 bytes

Ans: 0 to 2312 bytes

Q5: The duration field D of Medium Access Control layer frame contains

a: 2 bytes
b: 4 bytes
c: 6 bytes
d: 8 bytes

Ans: 2 bytes

Q6: Which multiple access technique is used by IEEE 802.11 standard for wireless LAN?

a: CDMA
b: CDMA/CD
c: CDMA/CA
d: None of the Above

Ans: CDMA/CA

Q7: What is the size of MAC address?

a:16-bits
b:32-bits
c:48-bits
d:64-bits

Ans : 48 Bits

Q8: This is what happens if two devices on the same Ethernet network determine the network is free, but attempt to transmit data at exactly the same time.

a: overlap
b: crossover
c: collision
d: None of the above

Ans: collision

Q9: This describes how the Ethernet protocol regulates communication among connection points.

a: Carrier Sense Multiple Access/Collision Detect
b: Discontinuous transmission
c: Aggregator
d: Wait and response

Ans: : Carrier Sense Multiple Access/Collision Detect

Q10: GSM is an example of

a: TDMA
b: FDMA
c: CDMA
d: SDMA

Ans: TDMA

Q11: Global Positioning System uses

a: CDMA
b: TDMA
c: SDMA
d: FDMA

Ans: CDMA

Q12: SDMA technique employs

a: Smart antenna technology
b: Use of spatial locations of mobile units within the cell

c: More Battery Consumption
d: Both a and b

Ans: Both a and b

Q13: The advantage of using SDMA over other spread spectrum technique

a: Mobile Station
b: Reduced spectral efficiency
c: Increased spectral efficiency
d: Both a and c

Ans: Both a and c

Q14: The increased capacity of SDMA is due to

a: Focused signal transmitted into narrow transmission beams
b: Smart antennas pointing towards mobile stations
c: Use of different frequencies at same time slot
d: Both a and b

Ans: Both a and b

Q15: In FDMA

1: Each user is assigned unique frequency slots
2: Demand assignment is possible
3: Fixed assignment is possible
4: It is vulnerable to timing problems

a: 1 and 2 are correct
b: 2 and 4 are correct
c: 1,2 and 3 are correct
d: All four are correct

Ans: 1,2 and 3 are correct

Q16: In TDMA , the user occupies the whole bandwidth during transmission

a: True

b: False

Ans: True

Q17: TDMA allows the user to have

a: Use of the same frequency channel for same time slot
b: Use of the same frequency channel for different time slot
c: Use of same time slot for different frequency channel
d: Use of different time slot for different frequency channels

Ans: b:Use of same frequency channel for different time slot

Q18: Direct Sequence Spread Spectrum demodulation uses

a: DPSK
b: FSK
c: ASK
d: QPSK

Ans: a: DPSK

Q19: OFDM is a technique of

1: Encoding digital data
2: Multiple carrier frequencies
3: Wide band digital communication
4: 4G mobile communication

a: 1,2 and 3 are correct
b: 2 and 3 are correct
c: 1,2 and 4 are correct
d: All four are correct

Ans: All four are correct

Q20: The troubles that OFDM faces over other spread spectrum techniques are

1: Sensitivity to Doppler shift
2: Frequency synchronization problems
3: Time synchronization problems

4: Low efficiency due to guard intervals

a: 1,2 and 3 are correct
b: 2 and 3 are correct
c: 1,2 and 4 are correct
d: All four are correct

Ans: 1,2 and 4 are correct

Q21: The guard interval is provided in OFDM

1: To eliminate the need of pulse shaping filter
2: To eliminate ISI
3: High symbol rate
4: Both a and b

Ans: Both a and b

Q22: Which of the following statements is correct about the FHSS?

a: FHSS is a type of narrowband signal
b: It uses the 78 frequency in the 2.4 GHz
c: It is referred as Frequency Hopping Spread Spectrum
d: All of the above

Ans: All of the above

Q23: DSSS system spreads the baseband signal by _____ the baseband pulses with a pseudo noise sequence.
a) Adding
b) Subtracting
c) Multiplying
d) Dividing

Answer: c: Multiplying

Q24: The bandwidth of the channel used in the hopset is called _____
a) Hopping bandwidth
b) Total hopping bandwidth
c) Instantaneous bandwidth

d) 3 dB bandwidth

Ans: c: Instantaneous bandwidth

Q25: In fast frequency hopping, hopping rate is less than the information symbol rate.
a) True
b) False

Ans: b: false

Q26: Minimum shift keying is similar to

a) Continuous phase frequency shift keying
b) Binary phase shift keying
c) Binary frequency shift keying
d) QPSK

Ans: a) Continuous phase frequency shift keying

Q27: The technique that may be used to reduce the side band power is

a) MSK
b) BPSK
c) Gaussian minimum shift keying
d) BFSK

Ans: c) Gaussian minimum shift keying

Q28: The technique that may be used to reduce the side band power is

a) MSK
b) BPSK
c) Gaussian minimum shift keying
d) BFSK

Ans: c) Gaussian minimum shift keying

Q29: The modulation techniques employed in for telephone modems is?

a: QAM

b: GMSK

c: QPSK

d: GFSK

Answer a) QAM

Q30: Quadrature Amplitude Modulation (QAM) is

a. Have same bandwidth used for two DSB-SC signals
b. Is also known as Bandwidth Conservation scheme
c. Is used in color television
d. All of the above

ANSWER: (d) All of the above

Q31: Which UE categories support 64QAM on the uplink?

a: Only category 5
b: Categories 3,4 and 5
c: None of them
d: All of them

Ans: A) Only category 5

Q32: What does the DC subcarrier indicate?

a: The identity of the cell
b: The antenna configuration
c: The center of the OFDM channel
d: The format of the data channel

Ans: C) The center of the OFDM channel

Q33: What processing step combines multiple OFDM subcarriers into a single signal for transmission?

a: FFT
b: IFFT
c: RF Combining
d: Channel Mapping

Ans: B) IFFT

Q34: In OFDM, what is the relationship between the subcarrier spacing f and the symbol time t?

a: There is no fixed relation

b: f = t

c: f * t = 2048
d: f = 1/t

Ans: d) f = 1/t

Q35: The constellation diagram of 16-QAM has _____ dots.

a: 4
b: 8
c: 16
d: None

Ans: c) 16

Q36: Which of the following is not an analog-to-analog conversion?

a: QAM
b: AM
c: PM
d: FM

Ans: a) QAM

Q37: If the baud rate for a 64-QAM signal is 2000, what is the bit rate?

a: 12000
b: 1000
c: 400
d: 300

Ans: a) 12000

Q38: 8PSK

a: 1 bit can be communicated in each modulation-symbol interval
b: 2 bits can be communicated in each modulation-symbol interval
c: 3 bits can be communicated in each modulation-symbol interval
d: 6 bits can be communicated in each modulation-symbol interval

Ans: C) 3 bits can be communicated in each modulation-symbol interval

Q39: 64QAM

a: 2 bits can be communicated in each modulation-symbol interval
b: 3 bits can be communicated in each modulation-symbol interval
c: 4 bits can be communicated in each modulation-symbol interval
d: 6 bits can be communicated in each modulation-symbol interval

Ans: d) 6 bits can be communicated in each modulation-symbol interval

Q40: Combining 16QAM or 64QAM with channel coding may produce less bit-error probability, compared to QPSK.

a: True
b: False

Ans: A) True

Q41: 16QAM or 64QAM uses more bandwidth and produces less bit-error probability compared to QPSK.

a: True
b: False

Ans: B) False

Q42: The modulation scheme that has the highest variations in instantaneous transmit power is

a: 64QAM
b: QPSK
c: 16QAM
d: 48QAM

Ans: A)64QAM

Q43: The reasons for using OFDM in 4G systems are

1: Better performance against time dispersion
2: Better performance against frequency selectivity
3: The design for an equalizer is easier for bandwidths larger than 5 MHz
4: It can perform well even at the edge of a cell

a: 1 and 2
b: 2,3 and 4
c: 1 and 3
d: All of the above

Ans: D) All of the above

Q44: The troubles that OFDM faces over other spread spectrum techniques are

1. Sensitivity to Doppler shift
2. Frequency synchronization problems
3. Time synchronization problems
4. Low efficiency due to guard intervals

a. 1,2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four correct

ANSWER: c. 1, 2 and 4 are correct

Q45: When we divide the band of orthogonal frequency division multiplexing (OFDM) into sub bands, it diminishes the effects of

a: Noise
b: Collision
c: Interference
d: Signal's absence

Ans: C) Interference

Q46: Advantages of using OFDM include

1. Avoids complex equalizers
2. Low symbol rate and guard interval
3. Avoids ISI
4. Multiple users at same frequency

a. 1,2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four correct

ANSWER: d. All the four correct

Q47: Which new modulation technique is used by EDGE

a: BPSK
b: 8 PSK
c: DQPSK
d: AFSK

Ans: B)8 PSK

Q48: What is the set of possible carrier frequencies in FH-SS?

a) Hopset
b) Hop
c) Chips
d) Symbols

Ans: A) Hopset

Q49: What is the set of possible carrier frequencies in FH-SS?

a) Hopset
b) Hop
c) Chips
d) Symbols

Ans: A) Hopset

Q50: Orthogonal Frequency Division Multiplexing (OFDM) is similar to

a) TDM
b) FSD
c) BPS
d) FDM

Ans: D) FDM

Q51: The inputs to an 8-QAM modulator is C=0 I=0 Q=1 with a reference of –sinwct. The output is

a) 0.765V, -45
b) 0.665V, -55
c) 0.565V, -45
d) 0.465V, -55

Ans: A) 0.765V, -45

Q52: What is the bandwidth efficiency of 128QAM systems?

a) 5
b) 6
c) 7
d) 4

Ans: c) 7

Unit 4 – GSM

Q1) Which of the following is the world's first cellular system to specify digital modulation and network level architecture?

Options:-
a) GSM
b) AMPS
c) CDMA
d) IS-54

Correct Answer: option a

Explanation: GSM was the world's first cellular system to specify digital modulation and level architectures and services. It is the world's most popular 2G technology. It was developed to solve the fragmentation problems of the first cellular systems in Europe.

Q2) Previously in 1980s, GSM stands for _____

Options:-

a) Global system for mobile
b) Groupe special mobile
c) Global special mobile
d) Groupe system mobile

Correct Answer: option b

Explanation: In the mid-1980s GSM was called by the name Groupe special mobile. In 1992, GSM changed its name to Global System for Mobile Communication for marketing reasons.

Q3) Who sets the standards of GSM?

Options:-
a) ITU
b) AT & T
c) ETSI
d) USDC

Correct Answer:- option c

Explanation: The setting of standards for GSM is under the aegis of the European Technical Standards Institute (ETSI). GSM task was to specify a common mobile communication system for Europe in the 900 MHZ band.

Q4) Which of the following does not come under the teleservices of GSM?

Options:-

a) Standard mobile telephony
b) Mobile originated traffic
c) Base originated traffic
d) Packet switched traffic

Correct Answer: option d
Explanation: GSM services follow ISDN guidelines and are classified as either teleservices or data services. Teleservices include standard mobile telephony and mobile originated or base originated traffic.

Q5) Which of the following comes under supplementary ISDN services?

Options:-
a) Emergency calling
b) Packet switched protocols
c) Call diversion
d) Standard mobile telephony

Correct Answer: option c
Explanation: Supplementary ISDN services are digital in nature. They include call diversion, closed user groups, and caller identification, and are not available in analog mobile networks. Supplementary services also include short messaging service (SMS).

Q6) Which of the following memory device stores information such as subscriber's identification number in GSM?

Options:-
a) Register
b) Flip flop
c) SIM
d) SMS

Correct Answer: option c
Explanation: SIM (subscriber identity module) is a memory device that stores information such as the subscriber's identification number, the networks and countries where the subscriber is entitled to service, privacy keys, and other user specific information.

Q7) Which of the following feature makes impossible to eavesdrop on GSM radio transmission?

Options:-
a) SIM
b) On the air privacy
c) SMS
d) Packet switched traffic

Correct Answer: option b
Explanation: The on the air privacy feature of GSM makes impossible to eavesdrop on a GSM radio transmission. The privacy is made possible by encrypting the digital bit stream sent by a GSM transmitter, according to a specific secret cryptographic key that is known only to the cellular carrier.

Q8) Which of the following does not come under subsystem of GSM architecture?

Options:-

a) BSS
b) NSS
c) OSS
d) Channel

Correct Answer: option d
Explanation: The GSM architecture consists of three major interconnected subsystems that interact between themselves and with the users through certain network interfaces. The subsystems are BSS (Base Station Subsystem), NSS (Network and Switching Subsystem) and OSS (Operation Support Subsystem).

Q9) Which of the following subsystem provides radio transmission between mobile station and MSC?

Options:-
a) BSS
b) NSS
c) OSS
d) BSC

Correct Answer: option a
Explanation: The BSS provides and manages radio transmission paths between the mobile stations and the Mobile Switching Center (MSC). It also manages the radio interface between the mobile stations and all other subsystems of GSM.

Q10) _____ manages the switching function in GSM.

Options:-
a) BSS
b) NSS
c) OSS
d) MSC

Correct Answer: option b
Explanation: NSS (Network and Switching Subsystem) manages the switching functions of the system. It allows the MSCs to communicate with other networks such as PSTN and ISDN.

Q11) _____ supports the operation and maintenance of GSM.

Options:-
a) BSS
b) NSS
c) OSS
d) MSC

Correct Answer: option c
Explanation: The OSS (Operation Support Subsystem) supports the operation and maintenance of GSM. It allows system engineers to monitor, diagnose, and troubleshoot all aspects of GSM.

Q12) _____ carries digitally encoded user data.

Options:-
a) Traffic channels
b) Control channels
c) Signalling channels
d) Forward channels

Correct Answer: option a
Explanation: Traffic channels carry digitally encoded user speech or user data. It has identical functions and formats on both the forward and reverse links.

Q13) _____ carries signalling and synchronizing commands.

Options:-
a) Traffic channels
b) Control channels
c) Signalling channels
d) Forward channels

Correct Answer: option b
Explanation: Control channels carry signalling and synchronizing commands between the base station and mobile station. Certain types of control channels are defined for just the forward or reverse link.

Q14) Which of the following is not a control channel of GSM?

Options:-
a) BCH
b) CCCH
c) DCCH
d) TCH

Correct Answer: option d
Explanation: There are three main control channels in the GSM system. These are the broadcast channel (BCH), the common control channel (CCCH) and the dedicated control channel (DCCH). Each control channel consists of several logical channels.

Q15) Which of the following is the forward control channel that is used to broadcast information?

Options:-
a) BCCH
b) CCCH
c) DCCH
d) TCH

Correct Answer: option a
Explanation: The broadcast control channel (BCCH) is a forward channel that is used to broadcast information such as cell and network identity, and operating characteristics of the cell.

Q16) Which of the following channel does not come under CCCH?

Options:-
a) PCH
b) RACH
c) DCCH
d) AGCH

Correct Answer: option c
Explanation: CCCH consists of three different channels. They are paging channel (PCH), which is a forward link channel, the random access channel (RACH) which is a reverse link channel, and the access grant channel (AGCH) which is a forward link channel.

Q17) Which of the following channel provides paging signals from base station to all mobiles in the cell?

Options:-
a) RACH
b) AGCH
c) DCCH
d) PCH

Correct Answer: option d
Explanation: The PCH provides paging signals from the base station to all mobiles in the cell. It notifies a specific mobile of an incoming call which originates from the PSTN.

Q18) _____ is a reverse link channel used by a subscriber unit to acknowledge.

Options:-
a) RACH
b) AGCH
c) DCCH
d) PCH

Correct Answer: option a
Explanation: The RACH (Random Access Channel) is a reverse link channel used by a subscriber unit to acknowledge a page from the PCH. It is also used by mobiles to originate a call.

Q19) Which of the following channel is used by base station to provide forward link communication to mobile?

Options:-
a) RACH
b) AGCH
c) DCCH
d) PCH

Correct Answer: option b
Explanation: The AGCH (Access Grant Channel) is used by the base station to provide forward link communication to the mobile. It carries data which instructs the mobile to operate in a particular physical channel with particular dedicated control channel.

Q20) Which of the following burst is used to broadcast the frequency and time synchronization control messages?

Options:-
a) FCCH and SCH
b) TCH and DCCH
c) RACH and TCH
d) FCCH and DCCH

Correct Answer: option a
Explanation: FCCH and SCH burst are used to broadcast the frequency and time synchronization control messages. They are used in TS0 of specific frames.

Q21) Which of the following burst is used to access service from any base station?

Options:-
a) TCH
b) RACH
c) SCH
d) FCCH

Correct Answer: option b
Explanation: Each user transmits a burst of data during the time slot assigned to it. The RACH burst is used by all mobiles to access service from any base station, and dummy burst is used as filter information for unused timeslots on forward link.

Q22) Group of superframes in GSM is called multiframe.

Options:-
a) True
b) False

Correct Answer: option b
Explanation: Each of the normal speech frames are grouped into larger structures called multiframes. These multiframes are grouped into superframes and hyperframes.

Q23) What is the total number of Carrier Frequencies that can be formed in a 25MHz band width of either Uplink or Downlink of GSM?

Options:-

A) 128

B) 126

C) 124

D) None

Correct Answer:- option C

Explanation:- The method chosen by GSM is a combination of Time- and Frequency-Division Multiple Access (TDMA/FDMA). The FDMA part involves the division by frequency of the (maximum) 25 MHz bandwidth into 124 carrier frequencies spaced 200 kHz apart.

Q24) What is the spacing between each carrier frequency to avoid interference and crosstalk?

Options:-

A) 100KHz

B) 200KHz

C) 128KHz

D) 256KHz

Correct Answer:- option b

Explanation:- The method chosen by GSM is a combination of Time- and Frequency-Division Multiple Access (TDMA/FDMA). The FDMA part involves the division by frequency of the (maximum) 25 MHz bandwidth into 124 carrier frequencies spaced 200 kHz apart.

Q25) In GSM-1800 band, the total number of Carrier Frequencies are ?

Options:-

A) 124

B) 248

C) 374

D) 448

Correct Option:- option C

Explanation:- 375 x 200KHz = 75 MHz

Q26) In a GSM-900 Band, what is the duplex spacing between uplink and downlink channels?

Options:-

A) 25MHz

B) 35MHz

C) 45MHz

D) None

Correct Answer:- option C

Explanation:-GSM-900 uses 890 - 915 MHz to send information from the Mobile Station to the Base Transceiver Station (BTS) (This is the “uplink”) and 935 - 960 MHz for the other direction (downlink), providing 124 RF channels spaced at 200 kHz. Duplex spacing of 45 MHz is used.

Q27) In a GSM-1800 Band, what is the duplex spacing between downlink and uplink channels?

Options:-

A) 75MHz

B) 85MHz

C) 95MHz

D) None

Correct Answer: Option C

Explanation:- GSM-1800 uses 1710 - 1785 MHz for the uplink and 1805 - 1880 downlink, providing 299 channels. Duplex spacing is 95 MHz.

Q28) What are the types of Logical channels in a GSM Structure or Architecture?

Options:-

A) Traffic channels

B) Broadcasting channels

C) control channels

D) All

Correct Answer: option d

Explanation: There are three types of logical channels: traffic channels (TCHs), control channels (CCHs), and the cell broadcast channel (CBCH).

Q29) Broadcasting is a concept of transferring information from _____ to _____?

Option:-

A) One to one

B) Many to one

C) One to many

D) Many to many

Correct Answer:- option c

Explanation: A BTS broadcasts a BCCH to all eligible mobiles for further negotiation.

Q30) What is the total bitrate after channel coding in a Half Rate TCH channel?

Options:-

A) 11.4kbps

B) 22.8kbps

C) 34.2kbps

D) None

Correct Answer: option a

Explanation: A GSM half rate channel uses 12 frames out of a 26-multiframe. The channel bit rate of a half-rate GSM channel is 11.4 kbit/s, although the actual data capacity is 4.8-7 kbit/s, depending on the channel coding.

Q31) What is the duration of a GSM TDMA Frame?

Options:-

A) 4.614ms

B) 5.614ms

C) 6.614ms

D) None

Correct Answer:- Option a

Explanation:- A GSM Multiframe is the basic unit, and is 120 ms long. There are 26 Frames in each Multiframe, with each Frame being 4.61538 ms long (120 ms/26).

Q32) BCCH (Broadcast Control Channel) frequency is also called _____?

Options:-

A) Engine

B) Driver

C) Pilot

D) None

Correct Answer:- Option c

Explanation: Pilot is another name of BCCH frequency.

Q33) Majority of the GSM Channels work on _____ interface?

Options:-

A) Abis interface

B) A interface

C) Um interface

D) M interface

Correct Answer:- option c

Explanation:- Um interface is also called Air interface. It works in between Mobile and BTS.

Q34) The type of information transferred in Traffic Channel (TCH) is ____ ?

Options:-

A) Voice

B) Data

C) Both Voice and Data

D) Signalling

Correct Answer:- Option c

Explanation:- Voice and Data are the type of information transferred in Traffic Channel.

Q35) What are the data rates of services available in ISDN and other services that can be transmitted in a TCH channel?

Options:-

A) 2.4kbps

B) 4.8kbps

C) 9.6kbps

D) All

Correct Answer:- Option D

Explanation:- With a TCH-Full rate (TCH/F), the maximum effective data rate possible is 9.6 Kbps. With a TCH-Half rate (TCH/H), the maximum data rate is 4.8 Kbps. The GSM PLMN also provides high-speed circuit switched data (HSCSD), which combines multiple TCH/Fs and can provide a maximum data rate of 56 Kbps.

Q36) Choose a Broadcast channel in GSM Architecture?

Options:-

A) BCCH (Broadcast Control Channel)

B) FCCH (Frequency Correction Channel)

C) SCH (Synchronization Channel), CBCH (Cell Broadcast Channel)

D) All

Correct Answer:- Option d

Explanation :- Broadcast Control Channel, Frequency Correction Channel, Synchronization Channel and Cell Broadcast Channel are Broadcast channel in GSM Architecture.

Q37) Choose a Broadcast Channel below.

Options:-

A) PCH (paging Channel)

B) AGCH (Access Grant Channel)

C) RACH (Random Access Channel)

D) None

Correct Option :- Option D

Explanation:- FCCH, SCH and CBCH are Broadcast Channel.

Q38) The channel BCCH is always defined in which time slot?

Options:-

A) Timeslot 0

B) Timeslot 1

C) Timeslot 4

D) Timeslot 8

correct Option:- Option A

Explanation:- Note that the BCCH is always transmitted in timeslot 0 on the first defined frequency.

Q39) If there are two TRX in a given Sector or Cell, BCCH is defined on the _____ TRX or frequency.

Options:-

A) First

B) Second

C) First or second

D) First and second

Correct Option:- Option A

Explantion:- Only first frequency is chosen for BCCH.

Q40) How many timeslots are present in a GSM TDMA frame whose time duration is 4.615ms?

Options:-

A) 4

B) 8

C) 16

D) 32

Correct Option:- Option B

Explanation:- 8 x 0.577ms = 4.615ms

Q41) What are the TDMA Multi frames used for TCH/H and TCH/F ?

Options:-

A) 26 TDMA frames

B) 51 TDMA frames

C) 26 or 51 TDMA frames

D) None

Correct Option:- Option C

Explanation:- traffic channel (TCH) is used to carry speech and data traffic. Traffic channels are

defined using a 26-frame multi frame, or group of 26 TDMA frames. The length of a

26-frame multi frame is 120ms. Out of the 26 frames, 24 are used for traffic, 1 is

used for the slow associated control channel.

Q42) Which is TRUE about maximum length of an SMS in a GSM network?

Options:-

A) 160 7-bit characters

B) 140 8-bit characters

C) 70 16-bit characters

D) All

Correct Option:- Option D

Explanation:- User can configure Support for Characters in SMS settings. Most of the phones display "Limited Character Set" or "Full Character Set" options or "Use Simple Characters" etc.

Q43) What is the maximum number of SMS that can be sent to a Mobile in one minute time?

Options:-

A) 1-5

B) 6-10

C) 11-15

D) 15-20

Correct Option:- Option B

Explanation:-To limit a modem to 10 messages per minute, define a limit of 10 messages per 60 seconds or 1 messages per 6 seconds.

Q44) Power control feature aims at receiving all bursts of transmission at _____ power level.

Options:-

A) Different

B) Variable

C) Same

D) None

Correct Option:- Option c

Explanation:- If different transmissions arrive at different power level, it causes interference.

Q45) What is the transmission bitrate between BTS and BSC?

Options:-

A) 8kbps

B) 16kbps

C) 32kbps

D) 64kbps

Correct Option:- Option B

Explanation:- TRAU multiplexes 16kbps bursts up to 64kbps before sending to MSC.

Q46) IMSI comprises of which parts_____

Options:-

A)MMC

B)CI

C)LAI

D)None

Correct Option: Option A

Explanation: In three parts IMSI comprises i.e. MMC, MNC and MSIN.

Q47) Radio transmitter in the base station of cellular communication contains____

Options:

A) Monopole
B) Guy wire
C) Audio processing
D) Free standing

Correct Option: Option C

Explanation: Radio transmitter in the base station of cellular communication contains of audio processing, Modulation and RF power amplifier assemblies.

Q48) GSM cellular communication system can operate in which frequency band?

Options:

A)400 MHz

B)200 MHz

C)1000 MHz

D) None

Correct Option : Option A

Explanation: GSM cellular communication system can operate in several band i.e. 400 MHz, 800 MHz, 900 MHz, 1800 MHz and 1900 MHz frequency bands.

Q49) which of the following is not in GSM transmitter System?

Options:

A) Segmentation
B) Channel coding
C) Guard band frequency
D) Interleaving

Correct Answer: Option c

Explanation: GSM transmission process steps are 1. A/D conversion, 2. Segmentation, 3 speech coding, 4 channel coding, 5 Interleaving, 6 Burst formatting, 7 encryption and Modulation and transmission.

Q50) Q50) What is the duration of a HYPERFRAME?

Options:

A) 3H 28M 2.2S

B) 3H 28M 50S

C) 3H 28M 53.76s

D) 3.5H

Correct Answer: Option C

Explanation: The longest recurrent time period of the structure is called hyperframe and has a duration of 3 h 28 mn 53 s 760 ms (or 12 533,76 s).

UNIT V : Current 3G and 4G Technologies for GSM and CDMA

Q1) EDGE is sometimes also referred as _____
a) HSCSD
b) 3GPP
c) EGPRS
d) EGSCSD
Answer: c
Explanation: EDGE is sometimes also referred to as Enhanced GPRS (EGPRS). It is an enhancement of a GSM network in which EDGE is introduced on top of the General Packet Radio Service (GPRS). It is used to transfer data in a packet switched mode on various time slots.

Q2) GPRS and EDGE supports which 2G standard?
a) GSM only
b) IS-136 only
c) GSM and IS-136 both
d) PDC

Answer: c
Explanation: GPRS (General Packet Radio Service) network provides a packet network on dedicated GSM or IS-136 radio channels. EDGE (Enhanced Data rates for GSM Evolution) is also developed keeping in desire both GSM and IS-136 operators.

Q3) Which new modulation technique is used by EDGE?
a) BPSK
b) 8- PSK
c) DQPSK
d) AFSK
Answer: b
Explanation: EDGE uses a new digital modulation format, 8- PSK (Octal Phase Shift Keying). It is used in addition to GSM's standard GMSK (Gaussian Minimum Shift Keying) modulation.

Q4) What is one disadvantage of EDGE in comparison to HSCSD and GPRS?
a) Low data rates
b) Small coverage range
c) Low speed
d) No advancement
Answer: b
Explanation: Because of the higher data rates and relaxed error control covering in many of the selectable air interface formats, the coverage range is smaller in EDGE than in HSCSD or GPRS.

Q5) Which new modulation technique is used by EDGE?
a) BPSK
b) 8- PSK
c) DQPSK
d) AFSK
Answer: b
Explanation: EDGE uses a new digital modulation format, 8- PSK (Octal Phase Shift Keying). It is used in addition to GSM's standard GMSK (Gaussian Minimum Shift Keying) modulation.

Q6)UMTS use which multiple-access technique?
a) CDMA
b) TDMA
c) FDMA
d) SDMA
Answer: a
Explanation: Although UMTS is designed to operate on evolved GSM core networks, it uses code division multiple access (CDMA) for its air interface. The majority of the 3G systems in operation employ CDMA, while the rest use TDMA. CDMA allows various users to share a channel at the same time, while TDMA allows users to share the same channel by chopping it into different time slots.

Q7) What is the minimum spectrum allocation required by W-CDMA?
a) 5 MHz
b) 20MHz
c) 1.25 MHz
d) 200 KHz
Answer: a
Explanation: W-CDMA/UMTS requires a minimum spectrum allocation of 5 MHz. Using this bandwidth, it has the capacity to carry over 100 simultaneous voice calls. It is able to carry data at speeds up to 2 Mbps in its original format. 20 MHz is the bandwidth defined for LTE. CdmaOne uses a bandwidth of 1.25 MHz. GSM's bandwidth is 200 KHz.

Q8) Which of the following is not a characteristic of Cdma2000?
a) Adaptable baseband signalling rates
b) Adaptable baseband chipping rates
c) Multicarrier technologies
d) OFDMA
Answer: d
Explanation: Cdma2000 does not use OFDMA technique. OFDMA is used by 4G networks. Cdma2000 uses rapidly adaptable baseband signalling rates and chipping rates for each user. It also provides multi-level keying within the same framework.

Q9) Cdma2000 1xEV was developed by _____
a) Motorola
b) AT&T Laboratories
c) Qualcomm
d) NTT
Answer: c
Explanation: Cdma2000 is an evolutionary advancement for CDMA. It was developed by Qualcomm Inc. It is a proprietary high data rate (HDR) packet standard that can be overlaid upon existing IS-95, IS-95B and Cdma2000 networks.

Q10) Which one of the following enables us to use the entire bandwidth simultaneously?
a. TDMA
b. CDMA
c. FDMA
d. All of the above
Answer: b
Explanation: CDMA (or code division multiple access) is a type of multiplexing that allows different signals to occupy only one transmission channel. In short, we can also say that CDMA allows us to use the entire bandwidth simultaneously.

Q11) In which one of the following times is specifically divided into several time slots that are in the fixed patterns?
a. CDMA
b. TDMA
c. FDMA
d. All of the above
Answer: b
Explanation: The TDMA is a type of digital cellular telephone communication technology. It allows the users to use the same frequency without interference. In the TDMA (or Time Division Multiple Access), time is divided into several required time slots that are in the fixed patterns. So the correct answer will be B.

Q12) Which of the following is not a TDMA standard of 2.5G network?
a) HSCSD
b) GPRS
c) EDGE
d) GSM
Answer: d
Explanation: GSM (Global System for Mobile) is a TDMA standard for 2G network. HSCSD (High Speed Circuit Switched Data), GPRS (General Packet Radio Service) and EDGE (Enhanced Data rates for GSM Evolution) are TDMA standards of 2.5G technology.

Q13) The interference between the neighboring base stations is avoided by
a. Assigning different group of channels
b. Using transmitters with different power level
c. Using different antennas
d. All of the above
ANSWER: a. Assigning different group of channels
Explanation: The interference between the neighbouring base stations is avoided by assigning different group of channels and reusing the same channel after a certain amount of distance.

Q14) In which one of the following codes with specific characteristics can be applied to the transmission?
a. CDMA
b. GPRS
c. GSM
d. All of the above
Answer: a
Explanation: The CDMA (or Code Division Multiple Access) is a type of multiplexing which allows various signals to occupy only the transmission channel. It usually optimized the use of the bandwidth in an efficient manner. So the correct answer is CDMA.

Q15) What is the full form of WLAN?
a) Wide Local Area Network
b) Wireless Local Area Network
c) Wireless Land Access Network
d) Wireless Local Area Node
Answer: b
Explanation: WLAN stands for Wireless Local Area Network. Wireless networks are increasingly used as a replacement for wires within homes, buildings, and office settings through the deployment of wireless local area networks (WLANs).

Q16) What is WISP?
a) Wideband Internet Service Protocol
b) Wireless Internet Service Provider
c) Wireless Instantaneous Source Provider
d) Wideband Internet Source Protocol
Answer: b
Explanation: WISP is wireless Internet Service Provider used to explore public LANs (publican). It builds a nationwide infrastructure of WLAN access points in selected hotels, restaurants or airports. It then charges a monthly subscription fee to users who wish to have always on Internet access in those selected locations.

Q17) What is the full form of UMTS?
a) Universal Mobile Telephone System
b) Ubiquitous Mobile Telephone System
c) Ubiquitous Mobile Telemetry System
d) Universal Machine Telemedicine System
Answer: a
Explanation: UMTS (Universal Mobile Telephone System) is a visionary air interface standard that was introduced in 1996. European carriers, manufacturers, and government regulators collectively developed the early version of UMTS as an open air interface standard for third generation wireless telecommunication.

Q18) UMTS does not has backward compatibility with _____
a) GSM
b) IS-136
c) IS-95
d) GPRS
Answer: c
Explanation: UMTS assures backward compatibility with the second generation GSM, IS-136 and PDC TDMA technologies. It is also compatible with all 2.5G TDMA techniques like GPRS and EDGE. But it does not provide compatibility to CDMA technologies of 2G and 2.5 G. IS-95 is a CDMA standard of 2G.

Q19) UMTS is also known as _____
a) IS-95
b) GPRS
c) CdmaOne
d) W-CDMA
Answer: d
Explanation: UMTS uses Wideband CDMA (W-CDMA) to carry the radio transmissions. Therefore, it is also referred to as W-CDMA. W-CDMA offers greater spectral efficiency and bandwidth to mobile network operators.

Q20) How much increase in spectral efficiency is provided by W-CDMA in comparison to GSM?
a) Two times
b) Three times
c) No increase
d) Six times
Answer: d
Explanation: W-CDMA can provide at least six times an increase in spectral efficiency over GSM at system level. Such a wider bandwidth is chosen to higher data rates as low as 8 kbps to as high as 2 Mbps on a single 5 MHz W-CDMA radio channel.

Q21) W-CDMA requires a complete change of RF equipment at each base station.
a) True
b) False
Answer: a
Explanation: W-CDMA is designed to provide backward compatibility and interoperability for all GSM, IS-136/PDC, GPRS and EDGE equipment. But due to a wider air interface bandwidth of W-CDMA, it requires a complete change of RF-equipment at each base station.

Q22) W-CDMA works in FDD mode only.
a) True
b) False
Answer: b
Explanation: W-CDMA works in both FDD and TDD mode. W-CDMA developed for wide area cellular coverage uses FDD. And TDD is used by W-CDMA for indoor cordless type applications.

Q23) What is the chip rate of W-CDMA?
a) 1.2288 Mcps
b) 3.84 Mcps
c) 270.833 Ksps
d) 100 Mcps
Answer: b
Explanation: W-CDMA uses a chip rate of 3.84 Mcps. Chip rate is the product of symbol rate and spreading factor. If the symbol rate is 960 Kbps and spreading factor is 4 for W-CDMA, then the chip rate is 3.84 Mcps. The chip rate for Cdma2000 and GSM are 1.2288 Mcps and 27.0833 Ksps respectively.

Q24) US digital cellular system based on CDMA was standardized as _____
a) IS-54
b) IS-136
c) IS-95
d) IS-76
Answer: c
Explanation: A US digital cellular system based on CDMA was standardized as Interim Standard 95 (IS-95). It was standardized by US Telecommunication Industry Association (TIA) and promised increased capacity.

Q25) User data in IS-95 is spread to a channel chip rate of _____
a) 1.2288 Mchip/s
b) 9.6 Mchip/s
c) 12.288 Mchip/s
d) 0.96 Mchip/s
Answer: a
Explanation: User data is spread to a channel chip rate of 1.2288 Mchip/s (a total spreading factor of 128) using a combination of techniques. The spreading process is different for the forward and reverse links in the original CDMA specification.

26) What does LTE stands for?
A) Level Telecom Advanced
B) Long Terminal Advanced
C) Long Term Evolution
D) Long Time Evolution

ANS (C) Long Term Evolution
Explanation: GPP engineers named the technology "Long Term Evolution" because it represents the next step (4G) in a progression from GSM, a 2G standard, to UMTS, the 3G technologies based upon GSM.

27) Though LTE is treated as a 4G (Fourth Generation) network, it is actually a ___ generation technology as it does not meet expectations.
A) 2.5G
B) 3G
C) 3.5G
D) 3.9G
ANS (D) 3.9G

28) What is the Access technique used by an LTE or LTE-A network?
A) WCDMA
B) FDMA
C) PDMA
D) OFDMA

ANS D) OFDMA
Explanation: For the LTE uplink, a different concept is used for the access technique.
Although still using a form of OFDMA technology, the implementation is called Single Carrier Frequency Division Multiple Access (SC-FDMA).
One of the key parameters that affects all mobiles is that of battery life.

29) What does OFDMA stands for?
A) Original Frequency Division Multiple Access
B) Orthogonal Frequency Division Multiple Access
C) Omitted Frequency Division Multiple Access
D) None

ANS: B) Orthogonal Frequency Division Multiple Access
Explanation: Orthogonal Frequency Division Multiple Access. OFDMA is the multi-user variant of the OFDM scheme where multiple access is achieved by assigning subsets of time-frequency resources to different users, allowing simultaneous data transmission from several users

30) What is the carrier Bandwidth in a typical 3G WCDMA-based network?
A) 1.4 Mhz
B) 3MHz
C) 5 MHz
D) 10 MHz
ANS C) 5 MHz
Explanation: UMTS uses Wideband CDMA - WCDMA - as the radio transmission standard.
It employs a 5 MHz channel bandwidth. Using this bandwidth it has the capacity to carry over 100 simultaneous voice calls,
or it is able to carry data at speeds up to 2 Mbps in its original format.

31) IMT-A (International Mobile Telecommunications Advanced) is _____.
A) LTE-A (LTE Advanced)
B) The system that implements specifications of ITU-R(ITU Radiocommunication)
C) Also known as 4.5G
D) All the above
ANS D) All the above

32) What is the other name for a 3GPP2 based 4G network?
A) Super Mobile Broadband (SMB)
B) Advanced Mobile Broadband (AMB)
C) Ultra Mobile Broadband (UMB)
D) None
ANS C) Ultra Mobile Broadband (UMB)
Explanation: **Ultra Mobile Broadband** (**UMB**) is a leading **mobile broadband** Orthogonal Frequency Division Multiple Access (OFDMA) solution that utilizes wider bandwidths (up to 20 MHz) to produce an **ultra** fast user experience.It is based on CDMA 1xEV-DO technology.

33) Which technology among the following offers High-Speed Packet Data?
A) CDMAOne
B) CDMA2000 1x
C) CDMA 1xEV
D) None
ANS C) CDMA 1xEV
Explanation:
CDMA 1xEV is the same as CDMA 1xEVDO.

34) Selecting a data rate for a Forward Channel or Reverse Channel is based on the ___ Ratio.
A) A/B
B) VSWR
C) C/I
D) None
ANS C) C/I
Explanation:
C/I = Carrier/Interference. It is pronounced as C BAR I ratio.

35) In a 1xEV-DO network, Reverse Links are implemented with ___ multiplexing.
A) Time Division
B) Code Division
C) Time Division and Code Division
D) None
ANS B) Code Division
Explanation:
Only the Forward links are implemented with both CDMA and TDM techniques.

36) What are the channels used in a CDMA 1xEVDO network?
A) Access channels similar to CDMA2000 1x systems
B) Similar to Enhanced Access channels of CDMA2000 1x
C) DeAccess channels
D) None

ANS A) Access channels similar to CDMA2000 1x systems
Explanation:
Only the plain CDMA2000 1x network uses both the Access channels and Enhanced Access channels.

37) Who gave the TIA-856 name to the 1xEV-DO standard?
A) ANSI
B) ITU
C) 3GPP
D) None

ANS B) ITU
Explanation:
ITU (International Telecommuniation Union)

38) SIM in a 3G network is called _____?
A) Micro SIM
B) Nano SIM
C) USIM
D) RSIM

ANS C) USIM
Explanation:
USIM = User SIM

39) What is the name of BSC equivalent part in a 3G mobile network?
A) Controller
B) Radio Switch Controller
C) Radio Network Controller
D) Radio Command Center

ANS C) Radio Network Controller
Explanation:
RNC = Radio Network Controller

40) A UMTS(Universal Mobile Telecommunication) network is a ___ network.
A) First Generation
B) Second Generation
C) Third Generation
D) Fourth Generation
ANS C) Third Generation

41) What is the maximum data rate supported by a 3G network or UMTS network?
A) 384 kbps
B) 2 Mbps
C) 32 Mbps
D) 42 Mbps
ANS D) 42 Mbps

42) State TRUE or FALSE. Closed-Loop Power Control is efficient than Open Loop Power Control.
A) FALSE
B) TRUE
ANS B) TRUE

Explanation:
As the Node-B sends power control bits every 0.66 ms to all Mobile Stations, power is adjusted immediately. It saves battery life.

43) If a 3G tower has 3 antennae, what is the total number of pilot frequencies under the tower?
A) 1
B) 3
C) 6
D) 8
ANS A) 1
Explanation:
Since it is code division multiplexing, one frequency is sufficient.

44)3G networks with TD-SCDMA technology are deployed mainly in ___ country.
A) Russia
B) China
C) Finland
D) USA

ANS B) China
Explanation:
SCDMA (Synchronous CDMA) was invented by CATT(Chinese Academy of Telecommunications Technology) to avoid licensing fee to other countries and save money.

45) What are the advantages of a TD-SCDMA-enabled 3G network?
A) Variable number of downlink and uplink channels with flexibility for support uneven traffic
B) Any spectrum (Spread Spectrum) can be used.
C) Sudden traffics can be augmented easily.
D) All the above
ANS D) All the above

46) What is the type of ARQ (Automatic Repeat Request) followed by a CDMA2000 1xEVDO network?
A) Hybrid ARQ
B) Redundancy ARQ
C) Incremental Redundancy Hybrid ARQ
D) None
ANS C) Incremental Redundancy Hybrid ARQ

47) What is the name given to a 4G LTE or UMB based Core Network Architecture?
A) SAE (System Architecture Evolution)
B) SAP (System Architecture Pro)
C) CAS (Core System Architecture)
D) None

ANS A) SAE (System Architecture Evolution)

48) What does AAS represent in a UMB (Ultra Mobile Broadband) based 4G network?
A) Antenna Average System
B) Advanced Antenna System
C) Analog Amplitude System
D) None
ANS B) Advanced Antenna System

49) The Evolution-Data Optimized Voice (EVDV) based 4G networks are according to ___ standards. (3GPP / 3GPP2)
A) 3GPP
B) 3GPP2
C) ANSI
D) ITU
ANS: A) 3GPP
Explanation:
3GPP is an acronym for Third Generation Partnership Projects.

50) The Forward Link Scheduling algorithm is also called ___ as it guarantees minimum service to all users.
A) Hybrid Algorithm
B) Kries Algorithm
C) Proportional Fair algorithm
D) None
ANS C) Proportional Fair algorithm

WPS Office

WPS Office

Mobile Communication MCQs

Unit 6

1. A field of technology that deals with a combination of real world and the data generated from computer.

A. ML

B. AI

C. AR

D. IoT

Correct Answer: C

Explanation: AR that is Augmented Reality is a field of technology that deals with a combination of real world and the data generated from computer.

---

2. Technology that completely involve a user inside a synthetic environment.

A. AR

B. VR

C. AI

D. ML

Correct Answer: B

Explanation: The answer is VR or Virtual Reality. VR technologies are known for immersing a user inside a synthetic environment. While immersed, the user cannot see the real world around him.

---

3. A game based on which animated franchise propelled AR into the mainstream in recent years?

A. Pokemon Go

B. Super Mario

C. Legend of Zeldia

D. Sonic The Hedgehog

Correct Answer: A

Explanation: Pokemon Go is a 2016 augmented reality mobile game developed and published by Niantic in collaboration with Nintendo and The Pokémon Company for iOS and Android devices.

---

4. A type of VR environment in which subjects are visually isolated from the real environment.

A. Immersive

B. Semi immersive

C. Non immersive

D. Augmented

View Answer

Correct Answer: A

Explanation: In immersive VR, subjects are visually isolated from the real environment. A virtual scene is responding to the subject's actions.

---

5. In this type of VR environment, the subjects can perform both in the real and virtual environment.

A. Immersive

B. Semi immersive

C. Non immersive

D. Augmented

Correct Answer: B

Explanation: The subjects perceive a strong involvement into the VE. Also, the subjects may perform less in the real environment.

---

6. HMD stands for?

A. Head Mounted Display

B. Head Masked Display

C. Head Made Display

D. Head Mounted Detection

Correct Answer: A

Explanation: It stands for Head Mounted Display. A kind of stereo display with two miniature screens and depth perception.

---

7. In this type of VR environment, the three-dimensional scene is considered as a part of the physical environment.

A. Immersive

B. Semi immersive

C. Non immersive

D. Augmented

Correct Answer: C

Explanation: This happens in non-immersive Virtual environment. Also, the subjects do fully respond in the real environment.

---

8. _____ keep track of position.

A. Motion analysers

B. Motion Trackers

C. HMD

D. SMD

Correct Answer: B

Explanation: Motion trackers keep track of position. Other devices are like head trackers and body trackers.

---

9. A term for Illusion of immersion by projecting stereo images on the walls and floor of a room.

A. CAVE

B. BOOM

C. GUI

D. HMD

Correct Answer: A

Explanation: CAVE is the term. CAVE stands for Cave Automatic Virtual Environment.

10. It is a mediated environment which creates the sensation in a user of being present in a (physical) surrounding.

A. WWW

B. VR

C. HMD

D. GUI

Correct Answer: B

Explanation: VR or virtual reality is a mediated environment which creates the sensation in a user of being present in a (physical) surrounding.

---

11. A term to describe the extent to which a user can modify form and content of a mediated environment.

A. Vividness

B. Richness

C. Interactivity

D. Mapping

Correct Answer: C

Explanation: Interactivity is the extent to which a user can modify form and content of a mediated environment. It comprises speed and mapping.

---

12. A tracking based on geo-location information.

A. Location based

B. Marker less

C. Marker based

D. GPS

Correct Answer: A

Explanation: Location based tracking is based on geo-location information obtained from device's location sensors. (Longitude, latitude, altitude etc).

13. A technique that enables light field which is generally the product of a light source scattered off objects.

A. AES

B. Holography

C. Cryptography

D. Gyrography

Correct Answer: B

Explanation: Holography enables a light field. It is to be recorded and later reconstructed when the original light field is no longer present.

---

14. Technologies that allow the user to see the real world, with virtual objects composited in the real world.

A. AR

B. VR

C. AI

D. SR

Correct Answer: A

Explanation: Augmented Reality (AR) allows a user to see real world, with virtual objects superimposed or composited with the real world.

---

15. Technologies that completely involve a user inside a synthetic environment.

A. AR

B. VR

C. AI

D. ML

Correct Answer: B

Explanation: The answer is VR or Virtual Reality. VR technologies are known for immersing a user inside a synthetic environment. While immersed, the user cannot see the real world around him.

16. Wearable computing device in the form of computerized eyeglasses.

A. HMD

B. Helmets

C. Smart Glasses

D. VR Glasses

Correct Answer: C

Explanation: Smart glasses are also called as optical head mounted displays. (OHMD), it has the capability of reflecting projected images as well as allowing users to see through it.

---

17. What does OFDMA stands for?

A. Original Frequency Division Multiple Access

B. Orthogonal Frequency Division Multiple Access

C. Omitted Frequency Division Multiple Access

D. None

Correct Answer: B

Explanation: OFDMA is an abbreviation for Orthogonal Frequency Division Multiple Access

---

18. What are the advantages of a 4G LTE network over 3G network?

A. More Spectral Efficiency

B. Low power consumption

C. Scalability and Flexibility with other networks

D. All the above

Correct Answer: D

Explanation: All of the above listed features are the advantages of 4G LTE over 3G

---

19. What is the Access technique used by an LTE or LTE-A network?

A. WCDMA

B. FDMA

C. PDMA

D. OFDMA

Correct Answer: D

Explanation: Orthogonal Frequency Division Multiple Access (OFDMA) is the access technique used by an LTE or LTE-A network

---

20. What is the name of a Base Transceiver Station in 2G system equivalent in a 4G LTE system?

A. nodeB

B. eNodeB

C. aNodeB

D. nodeBPro

Correct Answer: B

Explanation:

It is nothing but the tower side equipment that serves its users data and voice.

---

21. What is the other name for a 3GPP2 based 4G network?

A. Super Mobile Broadband (SMB)

B. Advanced Mobile Broadband (AMB)

C. Ultra Mobile Broadband (UMB)

D. None

Correct Answer: C

Explanation:

It is based on CDMA 1xEV-DO technology.

---

22. Initial 4G LTE standard supported Carrier Aggregation. State TRUE or FALSE.

A. TRUE

B. FALSE

Correct Answer: B

Explanation:

Only LTE-A and LTE-A-PRO support Carrier-Aggregation.

---

23. What type of handovers is supported by LTE?

A. Hard handover only

B. Soft handover only

C. Hard and soft handover

D. Hard, soft and softest handover

Correct Answer: A

Explanation: LTE supports only hard handover. It does not receive data from two frequencies at the same time because switching between different carrier frequencies is very fast so soft handover is not required.

---

24. What is the average uploading speed of 4G LTE network?

A. 1-3 Gbps

B. 2-5 Gbps

C. 1-3 Mbps

D. 2-5 Mbps

Correct Answer: D

Explanation: Verizon 4G LTE wireless broadband is 10 times faster than 3G able to handle download speeds between 5 and 12 Mbps (Megabits per second) and upload speeds between 2 and 5 Mbps.

---

25. What does LTE stands for?

A. Level Telecom Advanced

B. Long Terminal Advanced

C. Long Term Evolution

D. Long Time Evolution

Correct Answer: C

Explanation: LTE is abbreviation for Long Term Evolution

---

26. ITU stands for _.

A. International Television Union

B. Internal Telecommunication Union

C. Inventions for Telecommunication Union

D. International Telecommunication Union

Correct Answer: D

Explanation: ITU is abbreviation for International Telecommunication Union

---

27. MulteFire—a new, LTE-based technology that solely operates in _____ spectrum, and doesn't require an "anchor" in licensed spectrum.

A. Licensed

B. Unlicensed

C. Primary

D. Premium

Correct Answer: B

Explanation: The new technology broadens the LTE ecosystem to entities that may not own licensed spectrum, such as Internet Service Providers and enterprise/venue owners.

---

28. Based on 3GPP Release 13 and 14, MulteFire technology supports _____ for fair co-existence with Wi-Fi and other technologies operating in the same spectrum.

A. Hear Before Talk

B. Listen Before Talk

C. Hear Before Speak

D. Speak Before Hear

Correct Answer: B

Explanation: MulteFire technology supports Listen-Before-Talk for fair co-existence with Wi-Fi and other technologies operating in the same spectrum.

---

29. MulteFire is suitable for neutral host services where "_____" can serve "_____" out-of-box, using neutral unlicensed spectrum like 5 GHz.

A. any development, any component

B. any structure, any module

C. any host, any client

D. any deployment, any device.

Correct Answer: D

Explanation: MulteFire is suitable for neutral host services where "any deployment" can serve "any device" out-of-box, using neutral unlicensed spectrum like 5 GHz.

---

30. What are the performance benefits of MulteFire?

A. Enhanced capacity and coverage

B. Security inherent in LTE

C. Full mobility within MulteFire deployments providing quality-of-experience for services such as voice and video

D. All of the above

Correct answer: D

Explanation: Performance benefits of MulteFire in unlicensed spectrum are Enhanced capacity and coverage, Security inherent in LTE, Full mobility within MulteFire deployments providing quality-of-experience for services such as voice and video.

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31. MulteFire is based on 3GPP R13 LAA?

A. True

B. False

Correct Answer: A

Explanation: MulteFire is based on 3GPP R13 LAA which defines the downlink operation of LTE in unlicensed spectrum when assisted by an anchor in licensed spectrum—also known as supplemental downlink.

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32. The 5G Automotive Association was created in

A. September 2018

B. September 2016

C. January 2015

D. December 2016

Correct Answer: B

Explanation: The 5G Automotive Association was created in September 2016, by Audi AG, BMW Group

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33. 5GAA has how many Working Groups?

A. Eleven

B. Nine

C. Thirteen

D. Seven

Correct Answer: D

Explanation: 5GAA has seven Working Groups

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34. 5GAA primarily focuses on the deployment of cellular based communication, also known as

A. Cellular V2C

B. Cellular V2B

C. Cellular V2D

D. Cellular-V2X

Correct Answer: D

Explanation: 5GAA primarily focuses on the deployment of cellular based communication, also known as Cellular-V2X.

35. The 5GAA Working Groups develops

A. 5G frameworks

B. Practical aspects and required standards

C. Business cases for 5G

D. All of the above

Correct Answer: D

Explanation: The 5GAA Working Groups develop the frameworks, practical aspects, required standards, and business cases for 5G and the future application of connected mobility solutions.

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36. The AA in 5GAA stands for

A. Autonomous Automation

B. Automotive Automation

C. Active Autonomy

D. Actual Automation

Correct Answer: A

Explanation: 5GAA is abbreviation for 5G Autonomous Automation.

---

37. What does 5G stand for?

A. Five gigabytes

B. Fifth gateway

C. Five gigabit

D. Fifth generation wireless

Correct Answer: D

Explanation: 5G is an abbreviation for the fifth generation of wireless cellular technology.

---

38. 5G will offer latency of one millisecond or lower. What does latency refer to?

A. The time it takes to reboot a connection

B. The length of time devices will automatically connect to the network

C. The delay between an input and a desired outcome

D. The speed of detecting a disruption to the network

Correct Answer: C

Explanation: For example, the time it takes to launch an application will be unnoticeable due to 5G's latency.

---

39. To accommodate faster data transmission speeds, 5G has greater bandwidth. What other term is synonymous with bandwidth?

A. Capacity

B. Speed

C. Connection

D. Strength

Correct Answer: A

Explanation: Capacity A misconception is that bandwidth measures speed, but it actually describes the data transfer rate- or capacity.

---

40. Network slicing is a network management feature that 5G will allow. What does this mean users can have?

A. The ability to set up multiple connection points to one 5G network

B. The ability to create multiple virtual networks within a single 5G network

C. The ability to designate multiple passwords for one 5G network

D. The ability to utilize connections from other nearby networks

Correct Answer: B

Explanation: The ability to create multiple virtual networks within a single 5G network Network slicing will allow IoT devices to utilize unique 5G network features based on need or importance.

---

41. To generate high speeds, 5G utilizes the band of spectrum between 30 GHz and 300 GHz. What is this band of spectrum called?

A. Millimetre wave

B. Lower-frequency spectrum

C. Real-time spectrum

D. Radio-frequency band

Correct Answer: A

Explanation: Millimetre wave Millimetre wave is also known as extremely high frequency or very high frequency.

---

42. 5G will rely on compact, portable base stations that involve minimal power and can be placed in large quantities throughout geographical areas. What are these called?

A. Miniature cells

B. Frequent cells

C. Short-range cells

D. Small cells

Correct Answer: D

Explanation: Small cells Small cell base stations can be placed every 250 meters or so, creating a network of relayed signals.

---

43. A single 5G base station has the ability to send and receive signals from over 22 times the number of users, meaning it has massive MIMO. What does MIMO stand for?

A. Message in message out

B. Multiple in multiple out

C. Multiple input multiple output

D. Message input message output

Correct Answer: C

Explanation: Multiple input multiple output MIMO is used to define wireless network systems that use two or more transmitters and receivers to process more data at once.

---

44. During the testing phase, 5G broke records of spectrum efficiency. What does spectrum efficiency measure?

A. How many base stations can communicate over one spectrum

B. How many bits of data can be transmitted to a certain number of users per second

C. How many users can connect to one network

D. How many connections can run securely at once

Correct Answer: B

Explanation: How many bits of data can be transmitted to a certain number of users per second Spectrum efficiency helps make the most out of a network by increasing the number of users receiving data at once.

---

45. Spectrum efficiency and MIMO rely on a system called beamforming. What does this term refer to?

A. A connectivity system that identifies the closest base station for each user

B. A traffic-signalling system that breaks down data into smaller packets for transport

C. A connectivity system that caps the number of users utilizing the network at once

D. A traffic-signalling system that identifies the route of least interference to deliver data to a user

Correct Answer: D

Explanation: A traffic-signalling system that identifies the route of least interference to deliver data to a user. In short, beamforming creates a higher level of efficiency on the spectrum.

---

46. 5G transceivers will incorporate full-duplex technology for data transmission to double the capacity of wireless networks. What does full-duplex mean?

A. The ability to utilize the full capacity of transmission at all times

B. The ability to transmit and receive data at the same time and frequency

C. The ability to incorporate twice the number of transceivers into one base station

D. The ability to become compatible with all types of IoT devices

Correct Answer: B

Explanation: The ability to transmit and receive data at the same time and frequency with full-duplex technology, circuits must be designed to route incoming and outgoing signals to avoid collision.

---

47. Bit error rate provides the information about the type of error.

a) True

b) False

Correct Answer: B

Explanation: Bit error rate does not provide information about the type of error. However, bit error rate (BER) evaluation gives a good indication of the performance of a particular modulation scheme.

---

48. Which of the following is specified by a specific number of bit errors occurring in a given transmission?

a) Bit error rate

b) Equally likely event

c) Outage event

d) Exhaustive events

Correct Answer: C

Explanation: Outage event is specified by a specific number of bit errors occurring in a given transmission. Evaluating the probability of outage is one of the means to judge the effectiveness of the signalling scheme in a mobile radio channel.

---

49. Irreducible BER floor is created in frequency selective channels due to ____

a) Intermoult interference

b) Random spectral spreading

c) Time varying Doppler spread

d) Blind speed

Correct Answer: A

Explanation: Frequency selective fading is caused due to multipath delay spread which causes intersymbol interference. It results in an irreducible BER floor for mobile systems.

---

50. Irreducible BER floor is created in non-frequency selective channels due to ____

a) Intersymbol interference

b) Multipath time delay

c) Time varying Doppler spread

d) Blind speed

Correct Answer: C

Explanation: Even if a mobile channel is not frequency selective, the tie varying Doppler spread due to motion creates an irreducible BER floor. It is caused due random spectral spreading.

This sheet is for 2 Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**Correct Answer**
1	EDGE services are considered as _____ generation services.	a. 2G	b. 2.5G	c. 3G	d. None of the above	a
2	What is the maximum data rate supported by a 3G network or UMTS network?	a. 384 kbps	b. 2 Mbps	c. 32 Mbps	d. 42 Mbps	d
3	CDMA2000 technology is also a ___ network.	a. 2G	b. 3G	c. 4G	d. None	b
4	Most of the CDMA2000 (IS-2000) channels and functionalities are similar to ___.	a. IS-95	b. EVDO-95	c. UMTS	d. WCDMA	a
5	What does EVDO stand for in a CDMA2000 1x network?	a. Evolved Variable Data Optimized	b. Evolution-Data Optimized	c. Enhanced Data Optimized	d. None	b
6	CDMA 1x Ev-DO is a successor to ____.	a. CDMAOne	b. CDMA2000 1x	c. CDMA IS-95	d. None	b
7	What does CDMA2000 1x provides?	a. Voice	b. Data	c. Voice and Data	d. None	c
8	What is the basic data rate (Minimum data rate) in an EV-DO network?	a. 32 Kbps	b. 38.4 Kbps	c. 56 Kbps	d. 64 Kbps	b
9	In an EVDO network, all users of the same Sector share ___ in a TDMA mode.	a. Channel	b. Frequency	c. Code	d. None	a
10	CDMA2000 1xEV-DO follows ___ power control for Reverse channels.	a. Fixed	b. Dynamic	c. No power control	d. -	b

This sheet is for 1 Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**Correct Answer**

1	EDGE stands for?	a. Enhanced Data Rate for GSM Evolution	b. Enhanced Data for GSM	c. Enhanced Data for GSM Enhanced	d. None of the above	a
2	3GPP stands for ____?	a. 3rd Generation Pulse Project	b. 3rd Generation Partnership Project	c. 3rd Generation Protocols Project	d. None	b
3	What is the modulation technique used by WCDMA technology?	a. Amplitude Modulation	b. Separate Spectrum Modulation	c. Spread Spectrum Modulation	d. None	d
4	What is the Code name for CDMA2000 1xEV-DO?	a. IS-95	b. IS-2000	c. IS-856	d. None	c
5	EV-DV stands for ___.	a. Evolution-Data Variable	b. Evolution-Data Versatile	c. Evolution Data and Voice	d. Enhanced Data and Voice	c
6	What is the Multiplexing technique followed by an 1xEV-DO network?	a. FDM (Frequency Division Multiplexing)	b. PDM (Phase Division Multiplexing)	c. TDM (Time Division Multiplexing)	d. None	c
7	A Virtual Soft Handoff in a 1xEVDO system works in ___ way.	a. Forward	b. Reverse	c. Both Forward and Reverse	d. None	a
8	What are the handoffs implemented in a CDMA2000 1x network?	a. Soft Forward and Soft Reverse handoffs	b. Hard Forward and Hard Reverse Handoffs	c. Both A and B	d. None	c
9	Choose a correct statement about CDMA2000 1x network.	a. It uses Convolution Code	b. It uses Turbo Code	c. It uses 48 Order FIR filter.	d. All	d
10	What are the Handoffs implemented in a CDMA2000 1x-EV-DO network?	a. Forward Virtual Soft Handoff	b. Reverse Soft Handoff	c. A and B	d. None	c

This sheet is for 3 Mark questions

S.r	Question	a	b	c	d	Correct

No						Answer
1	What is the interface between NodeB and RNC in a WCDMA network?	a. Lub	b. Luc	c. Lud	d. Lue	a
2	Which is the technology used by WCDMA to transfer data packets in its RAN network (Air Interface + Nodeb.?	a. IP	b. Frame Relay	c. ATM (Asynchronous Transfer Mode)	d. None	c
3	Identify CDMA Forward Channels below.	a. F-PICH (Forward Pilot Channel)	b. F-PCH (Forward Paging Channel)	c. F-SYNCH (Forward Sync Channel)	d. All the above	d
4	Identify CDMA Reverse Channels below.	a. R-SCH (Reverse Supplemental Channel)	b. R-SCCH (Reverse Supplemental Code Channel)	c. R-PCSCH (Reverse Power Control Sub-Channel)	d. All the above	d
5	Which technology among the following offers High-Speed Packet Data?	a. CDMAOne	b. CDMA2000 1x	c. CDMA 1xEV	d. None	c
6	What is the Channel bandwidth of an EV-DO carrier?	a. 1 MHz	b. 1.25 MHz	c. 5 MHz	d. None	b
7	An EV-DO carrier has the same bandwidth of ____.	a. IS-95A CDMA	b. IS-2000 1xRTT	c. IS-95A and IS-2000 1xRTT	d. None	c
8	A CDMA2000 1xEV-DO offers data services through ___ switching.	a. Circuit Switching	b. Packet Switching	c. Circuit and Packet Switching	d. None	b

9	High Rate Packet Data Access (HRPDa. of a EV-DO Rev-A provided good data rates due to _____ techniques.	a. Spread Carrier	b. Mobility Managemen t	c. Both SC (Spread Carrier) and MM (Mobility Management)	d. None	c
10	In a CDMA2000 1xEV-DO network, Forward channels always transmit at ____ power.	a. Half power	b. Variable Power	c. Full Power	d. None	c

This sheet is for 1 Mark questions						
S. r No	**Question**	**a**	**b**	**c**	**d**	**correct answer**
1	What is the Access technique used by an LTE or LTE-A network?	A) WCDMA	B) FDMA	C) PDMA	D) OFDMA	d
2	What is the main way we interact with technology currently?	a. A Keyboard	b. Voice	c. Eyes	d. Thoughts	a
3	How do most people use AR currently?	a. Their computers	b.Their phones	c. Their TV's	d. AR Goggles	b
4	What does 5G stand for?	a.The fifth generation of mobile device technology.	b. The fifth generation of wireless network technology.	c. The fifth generation of data processing techology.	d. None of these	b
5	_____ is the foundation of our 4G LTE network.	a. 600MHz	b. 800MHz	c. 700MHz	d. None of these	a
6	Which of the following is NOT a constraint of VR?	a. It can only be used for Science and Geography	b. It can be costly	c. Developing lessons/experiences can be time consuming	d.Resistance to new technology from teachers	a

7	What are the 3 types of VR?	a. Immersive, 3D, non-immersive	b. Immersive, semi-immersive, non-immersive	c. Digital, semi-immersive, projective	d. 3D, non-immersive, digital	b
8	Difference between VR and AR	a. VR adds to your vision | AR replaces it	b. VR is real world | AR is virtual environment	c.VR is like YouTube | AR is like African Technology	d.VR replaces your vision | AR adds to it	d
9	What does AR stand for?	a. Augmented Realistic	b. Armed Reindeers	c. Augmented Reality	d. Augmented Real	c
10	What is VR NOT used for?	a. Video Games	b. Military Training	c.Flight Simulation	d.Swimming Goggles	d

This sheet is for 2 Mark questions

S.r No	Question	a	b	c	d	con ans
1	What is the other name for a 3GPP2 based 4G network?	A) Super Mobile Broadband (SMB)	B) Advanced Mobile Broadband (AMB)	C) Ultra Mobile Broadband (UMB)	D) None	
2	This game launched augmented reality (AR) into the spotlight in recent years...	a. Super Mario	b. Pokemon	cWorld of Warcraft	d.Fortnite	
3	Augmented reality (AR) provides features that are...	a. Visual, interactive, and 3D	b. Collaborative, virtual, and simulated	c. Computer-generated, sensory, and virtual	d. Sounds, sensory, and cost-efficient	
4	Which definition best fits "Augmented Reality"?	a. Technology that turns physical objects into digital objects	b. Technology that overlays digital information on top of real world items	c. Technology that puts users in a new digital environment	d. Technology that can achieve a human-level understanding of images	
5	AR technology allows students to interact with the physical world by _____.	a. Moving around to change perspectives	b. Moving closer/further to change scale	c. Select virtual objects by pointing to them	d. All of the above	

6	What group was one of the first to start using Augmented Reality?	a. Doctors	b. The Military	c.Businessmen	d. Engineers	
7	What is AR?	a. When environment is fully computer generated	b. Users immersed in virtual environment	c. A type of video camera	d. A reindeer stuck in a bucket	
8	Mixed Reality is _____.	a. curve fitting	b. When virtual object overlaid on real-world environment	c. When virtual world combined with real- world	d. All of the above	
9	Which of the following is a characteristic of Virtual Reality?	a. Simulates complete or partial real-world experience	b. Created by a computer	c. Stimulates senses like sight, hearing, and touch	d. All of the answers are correct.	
10	Which one of the senses does not applied in Virtual Reality?	a. Sound	b. Vision	c. Touch	d. Taste	

This sheet is for 3 Mark questions

S.r No	Question	a	b	c	d	correct answer
1	How will we interact with technology in the future?	a. A Keyboard	b. Voice	c. Eyes	d. Thoughts	d
2	An example of non-immersive VR device is	a. An IMAX	b. An iPad	c. A virtual reality headset	d. A screen projection	b

3	Virtual Reality	a. places the experiencer in another location entirely. Whether that location has been generated by a computer or captured by video, it entirely occludes the experiencer's natural surroundings.	b.is the view that is visible to the experiencer while rotating their head from a fixed body position. The average human field of view is approximately 200 degrees.	c. Anything related to or that will impact the user's attitude or emotions for a product, system or service.	d. a set of goggles or a helmet with tiny monitors in front of each eye to generate images seen by the wearer as three-dimensional	a
4	Which definition best fits "Augmented Reality"?	a. Technology that turns physical objects into digital objects	b. Technology that overlays digital information on top of real world items	c. Technology that completely immerses users in a new digital environment	d. Technology that can achieve a human-level understanding of images	b

5	Virtual Reality	a. An open-source operating system for mobile devices created by Google	b. Images, videos, animations or even 3D models that appear whenever Cospaces sees an image that it recognises	c. The computer-generated simulation of a three-dimensional image or environment that can be interacted with in a seemingly real or physical way by a person using special electronic equipment, such as the Oculus Rift	d. An image or graphic superimposed over an Image Target	c

This sheet is for 1 Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**Correct Answer**
1	What are the three main parts of a GSM Architecture or Structure?	a. Mobile Station	b. BSS - Base Station Subsystem	c. NSS - Network and Switching Subsystem	d. All the above	d
2	What are the main parts of a Mobile Station in a GSM Network?	a. MT - Mobile Terminal	b. SIM - Subscriber Identity Module	c. Both A and B	d. None	c

3	What are the main parts of a BSS (Base Station Subsystem) in a GSM network?	a. BTS - Base Transceiver Station	b. BSC - Base Station Controller	c. A and B	d. None	c
4	Each Mobile Terminal is identified by a unique _____ number?	a. IMEI	b. SIM	c. IMSI	d. None	a
5	Each SIM is identified by a unique _____ number?	a. IMSI	b. IMEI	c. MSDN	d. None	a
6	Your mobile number is actually called _____ number.	a. IMSI	b. SIM	c. MSISDN	d. None	c
7	IMSI number of a SIM is also called?	a. MSISDN	b. IMEI	c. ICCID	d. None	a
8	What is PUK code of a SIM?	a. PIN Unlock Key	b. 4 digit code	c. It is like a password to enter after inserting SIM in a mobile for the first time. It prevents misuse.	d. All	d
9	What is the maximum number of Transceivers a BTS can handle is ?	a. 8	b. 12	c. 16	d. 22	c
10	What are the functions of a BSC?	a. Handovers, exchange functions	b. Frequency hopping	c. Control of radio frequency power level of BTS	d. All	d

This sheet is for 2 Mark questions

S.r No	Question	a	b	c	d	Correct Answer
1	Each cell in a GSM network has ?	a. Cell number	b. Cell Global number	c. Cell Global Identity number	d. None	c
2	A group of cells in a GSM network has a _____ number.	a. Location number	b. Location Area number	c. Location Area Identity number	d. None	c
3	Power control feature in a GSM network works on the _____ side?	a. Mobile side	b. BTS side	c. Both Mobile side and BTS side	d. None	c
4	Discontinuous Reception in a GSM network is aimed at saving _____ power.	a. BTS	b. BSC	c. Mobile Station	d. None	c
5	Discontinuous Reception is implemented with _____ in a GSM network.	a. Sideband channel	b. Pilot channel	c. Paging channel Sub channels	d. None	c
6	What is the duration of a GSM TDMA Frame?	a. 4.614ms	b. 5.614ms	c. 6.614ms	d. None	a
7	What are the types of Logical channels in a GSM Structure or Architecture ?	a. Traffic channels	b. Broadcasting channels	c. Common control channels, Dedicated control channels	d. All	d

8	Majority of the GSM Channels work on _____ interface?	a. Abis interface	b. A interface	c. Um interface	d. M interface	c
9	Choose a Broadcast channel in GSM Architecture ?	a. BCCH (Broadcast Control Channel)	b. FCCH (Frequency Correction Channel)	c. SCH (Synchronization Channel), CBCH (Cell Broadcast Channel)	d. All	d
10	What is TRUE about a SCH channel of GSM Architecture ?	a. It carries Time Synchronization data	b. It contains BSIC (Base Station Identity Code)	c. It contains TDMA Frame number	d. All	d

This sheet is for 3 Mark questions

S.r No	Question	a	b	c	d	Correct Answer
1	Which technique of GSM Architecture tells the mobile to advance it's transmission bursts (data) so that overlap with other bursts may be avoided at channel?	a. DTX	b. TA - Timing Advance	c. Power Control	d. None	b
2	What is the total number of Carrier Frequencies that can be formed in a 25MHz band width of either Uplink or Downlink of GSM?	a. 128	b. 126	c. 124	d. None	c
3	What is the data rate or speed offered by a GPRS connection?	a. 56-115kbps	b. 9-256kbps	c. 64-128kbps	d. None	a

4	GPRS uses which unused channels for transportation of Data in general?	a. SDCCH	b. BCCH	c. TCH	d. SCH	c
5	In a GPRS network, SGSN is the equivalent of _____ system in GSM.	a. BSC	b. MSC	c. VLR	d. GMSC	b
6	GPRS Roaming from one SGSN to another SGSN is offered by ?	a. GMSC	b. GGSN	c. HLR	d. VLR	b
7	A GPRS network contains Firewalls to _____?	a. Hack phones	b. Intercept phones	c. Protection from Virus	d. None	c
8	A GPRS Network is a part of ____ in GSM network.	a. BTS	b. BSS	c. NSS	d. VLR	c
9	Which is the main protocol that transfers packets in a GPRS Core network?	a. GTP	b. SSTP	c. SCTP	d. None	a
10	What is the interface between GGSN and External Packet Network(Internet) in a GPRS structure?	a. Gs	b. Gn	c. Gi	d. Gp	c

This sheet is for 1 Mark questions

S. r No	Question	a	b	c	d	Correct Answer

1	_____ is a server problem of wireless networks using CDM	a. Hidden and Exposed Terminals.	b. Near and Far Terminals.	c. Open and Close Terminals.	d. First and Last terminals.	b
2	TDMA is a multiple access technique that has	a. Different users in different time slots	b. Each user is assigned unique frequency slots	c. Each user is assigned a unique code sequence	d. Each signal is modulated with frequency modulation technique	a
3	TDMA allows the user to have	a. Use of same frequency channel for same time slot	b. Use of same frequency channel for different time slot	c. Use of same time slot for different frequency channel	d. Use of different time slot for different frequency channels	b
4	GSM is an example of	a. TDMA cellular systems	b. FDMA cellular systems	c. CDMA cellular systems	d. SDMA cellular systems	a
5	Global Positioning System uses	a. CDMA	b. TDMA	c. SDMA	d. FDMA	a
6	The guard interval is provided in OFDM	a. To eliminate the need of pulse shaping filter	b. To eliminate ISI	c. High symbol rate	d. Both a and b	d
7	In DSSS the signal is recovered using	a. Low pass filter	b. High pass filter	c. Band pass filter	d. Band stop filter	c
8	Fast frequency hopping is	a. Several modulations per hop	b. Several modulations per symbol	c. Several symbols per modulation	d. None of the mentioned	d
9	In which technique is phase coherence hard to maintain?	a. Direct sequence	b. Frequency hopping	c. Direct sequence & Frequency hopping	d. None of the mentioned	b
10	The frequency hopping system uses _____ modulation scheme.	a. FSK	b. BPSK	c. MFSK	d. MPSK	c

This sheet is for 2 Mark questions

S.r No	Question	a	b	c	d	Correct Answer
1	Which filter is used to get the final FHSS signal?	**a.** Low pass filter	**b.** High pass filter	**c.** Band pass filter	**d.** Band stop filter	c
2	The minimum spacing between consecutive hop positions gives the	**a.** Minimum number of chips necessary	**b.** Maximum number of chips necessary	**c.** Chip rate	**d.** None of the mentioned	a
3	Which system allows larger processing gain?	**a.** Direct sequence	**b.** Frequency hopping	**c.** Direct sequence & Frequency hopping	**d.** None of the mentioned	b
4	Spread spectrum makes _____ difficult.	**a.** Jamming	**b.** Interception	**c.** Jamming & Interception	**d.** None of the mentioned	c
5	Spread spectrum has immunity from	**1.** Noise	**2.** Multi-path distortion	**3.** Noise & Multi-path distortion	**4.** None of the mentioned	c
6	Frequency hopping system can provide reliable mitigation only if	**a.** Hopping rate is greater than the symbol rate	**b.** Hopping bandwidth is large	**c.** Hopping rate is greater than the symbol rate & its bandwidth is large	**d.** None of the mentioned	c
7	For QAM, a "constellation diagram" shows:	a. location of symbols in "symbol space"	b. separation of symbols in "symbol space"	c. effects of noise on symbols	d. all of the above	d
8	For QAM, the two dimensions of its symbol space are:	a. amplitude and frequency	b. amplitude and phase angle	c. frequency and phase angle	d. I-bits and Q-bits	b
9	**QPSK is a modulation scheme where each symbol consists of**	a. 4 bits	b. 2 bits	c. 1 bit	d. M number of bits, depending upon the requirement	b
10	**The data rate of QPSK is _____ of BPSK.**	a. Thrice	b. Four times	c. Twice	d. same	c

This sheet is for 3 Mark questions

S.r	Question	a	b	c	d	Correct

No						Answer
1	What is the size of MAC Address?	a. 48 bits	b. 16 bits	c. 32 bits	d. 8 bits	a
2	The guard interval is provided in OFDM	a. To eliminate the need of pulse shaping filter	b. To eliminate ISI	c. High symbol rate	d. Both a) and b)	d
3	The increase in number of users in PURE ALOHA causes	a. Increase in delay	b. Increase in probability of collision	c. Increase in spectrum	d. Both a) and b)	d
4	TDMA is used instead of TDM when:	a. all the signals come from the same source	b. the signals come from different sources	c. TDM is used in RF communications	d. they mean the same thing	b
5	When calculating the maximum number of users, a limiting factor in FDM is:	a. the type of media used	b. the length of the channel	c. the bandwidth of each signal	d. all of the above	c
6	Spread-spectrum can be done by using:	a. computer-controlled frequency reuse	b. frequency-hopping	c. direct-sequence method	d. all of the above	d
7	For a given data rate, direct-sequence systems, compared to standard RF systems, use:	a. about the same bandwidth	b. much more bandwidth	c. much less bandwidth	d. approximately double the bandwidth	b
8	A receiver for frequency-hopping spread-spectrum would be:	a. a narrowband receiver	b. a wideband receiver	c. a direct-conversion receiver	d. a CDMA receiver	a
9	CDMA:	a. cannot be used with frequency-hopping spread-	b. cannot be used with direct-sequence spread-	c. cannot be used on an RF channel	d. allows many transmitters to use a band simultaneous	d

		spectrum	spectrum		ly	
10	For optimal performance, CDMA requires the use of:	a. orthogonal PN sequences	b. non-orthogonal PN sequences	c. true-random PN sequences	d. none of the above	a

This sheet is for 3 Mark questions

S.r No	Question	a	b	c	d	Correct Answer
1	If more number of cells are necessary in the frequency reuse distance, then the segmentation & dualization techniques get _____	**a.** united	**b.** divided	**c.** restricted	**d.** filtered	a
2	Which method of cellular network assists in minimizing the co-channel interference associated with the angle of degree?	**a.** Cell Splitting	**b.** Cell Sectoring	**c.** Cell Segmentation & Dualization	**d.** None of the above	b

3	Which effect is widespread in adjacent-channel interference especially after the reception of a weak signal by a mobile user from the base-station?	**a.** Near-far effect	**b.** Doppler's effect	**c.** Capture effect	**d.** Kendall effect	a
4	In a cellular telephone system, which type of interference results from imperfect design of filters in receivers by allowing nearby frequencies to enter the receiver?	**a.** Co-channel Interference	**b.** Adjacent-channel Interference	**c.** Both a and b	**d.** None of the above	b
5	Which antennas are used at the center of the cells for the system with hexagonal-shaped cells?	**a.** Omni-directional antennas	**b.** Sectored directional antennas	**c.** Both a and b	**d.** None of the above	a
6	If the system is designed with the usage of hexagonal-shaped cells, how are the base-stations located?	**a.** At the centre of cell	**b.** At the edge of cell	**c.** At the corner of the cell	**d.** All of the above	d
7	Which hand-off stage deals with the relinquishment of unnecessary frequency channels by keeping the availability for other mobile users?	**a.** Initialization	**b.** Resource Reservation	**c.** Call Execution	**d.** Call Completion	d

8	In cellular telephone network, which component controls the switching between public wireline telephone network and the base station of cells for supporting the different calls between landline to mobile, mobile to landline and mobile to mobile calls?	**a.** Electronic Switching Center (ESC)	**b.** A Cell Controller	**c.** Radio Transmitter & Receiver	**d.** A common communicatio n protocol	a
9	Which among the following represents the flawless hand-off with no perceivable interruption of service?	**a.** Hard hand-off	**b.** Soft hand-off	**c.** Intracell hand-off	**d.** Intercell hand-off	b
10	Coherence time refers to	a. Time required to attain a call with the busy base station	b. Time required for synchronizatio n between the transmitter and the receiver	c. Minimum time for change in magnitude and phase of the channel	d. None of the above	c

This sheet is for 2 Mark questions

S.r No	Question	a	b	c	d	Correct Answer
1	Radio capacity may be increased in cellular concept by	a. Increase in radio spectrum	b. Increasing the number of base stations & reusing the channels	c. Both a & b	d. None of the above	b

2	Spectrum Efficiency of a cellular network is	a. The traffic carried by whole network	b. The traffic carried per cell divided by the bandwidth of the system and the area of a cell	c. Expressed in Erlang /MHz /km2	d. Both b and c	d
3	The advantage of using frequency reuse is	a. Increased capacity	b. Limited spectrum is required	c. Same spectrum may be allocated to other network	d. All of the above	d
4	The strategies acquired for channel assignment are	a. Fixed	b. Dynamic	c. Regular	d. Both a and b	d
5	The techniques used to improve the capacity of cellular systems are	a. Splitting	b. Sectoring	c. Coverage zone approach	d. All of the above	d
6	In spread spectrum technique, the multiple users are assigned with	a. Same spectrum and same PN code	b. Same spectrum and different PN code	c. Different spectrum and different PN code	d. Different spectrum and same PN code	b
7	Direct sequence spread spectrum demodulation uses	a. DPSK	b. FSK	c. ASK	d. QPSK	a
8	Fast hopping is	a. More than one frequency hop during each symbol	b. Hopping rate greater than or equal to information symbol rate	c. One or more symbols transmitted between frequency hops	d. Both a and b	d
9	Pure ALOHA is a	a. Random access protocol	b. Scheduled access protocol	c. Hybrid access protocol	d. Demand access protocol	a
10	The increase in number of users in PURE ALOHA causes	a. Increase in delay	b. Increase in probability of collision	c. Increase in spectrum	d. Both a and b	d

This sheet is for 1 Mark questions

S.rNo	Question	a	b	c	d	Correct Answer

1	In Handoff	a. Process of transferring the call to the new base station	b. transfers the call	c. New channel allocation is done	d. All of the above	d
2	Delay in handoffs is caused due to	a. Week signal conditions	b. High traffic conditions	c. Un availability of the channel	d. All of the above	d
3	Inter system Handoffs are done	a. When mobile station moves in two cellular systems with different MSC	b. When mobile station moves between two cellular systems	c. When mobile station receives more power from other base station than the serving base station	d. All of the above	d
4	When a fraction of assigned channel is reserved for handoffs, it is	a. Guard channel concept	b. Fixed channel assignment	c. Dynamic channel assignment	d. None of the above	a
5	While handoffs, the termination of call may be avoided by	a. Providing Guard channel	b. Queuing of handoffs	c. Both a) and b)	d. None of the above	c
6	Dwell time is the time for	a. A call within the cell	b. Hand off	c. Waiting for channel allocation	d. None of the above	a
7	Dwell time depends upon	a. Interference	b. Distance between the subscriber and the base station	c. Propagation of call	d. All of the above	d
8	Mobile Assisted Handoff (MAHO) provides	a. Faster handoffs	b. Suitability for frequent handoffs	c. MSC need not monitor the signal strength	d. All of the above	d

9	Co- channel reuse ratio depends upon	a. Radius of the cell	b. Distance between the centers of the co channel cells	c. Frequency allocation of nearest cells	d. Both a) and b)	d
10	Interference in frequency bands may lead to	a. Cross talk	b. Missed calls	c. Blocked calls	d. All of the above	d

This sheet is for 1 Mark questions

S. r No	Question	a	b	c	d	Correct Answer
1	1G or First-Generation Mobile Network is _____?	a. Analog	b. Digital	c. Sequential	d. Fuzzy	a.
2	In a 1G network, the type of communication between Tower of BTS and Switching Center is _____?	a. Analog	b. Digital	c. Discrete	d. Diminished	b.
3	What are main problems in 1G technology?	a. Noise	b. Security	c. Poor Battery backup	d. All the above	d.
4	What is the Cell Size or Coverage Area in 1G technology?	a. 1-5Km	b. 20-60Km	c. 5-50Km	d. 2-30Km	d.
5	Modulation technique employed by AMPS 1G network is _____?	a. TDMA	b. FDMA	c. CDMA	d. PDMA	b.
6	DAMPS or Digital-AMPS network is treated as a ___ network.	a. 1G	b. 2G	c. 1.5G	d. None of the above	b.
7	What are the three main parts of a GSM Architecture or Structure?	a. Mobile Station	b. BSS - Base Station Subsystem	c. NSS - Network and Switching Subsystem	d. All the above	d.
8	What are the main parts of a Mobile Station in a GSM Network?	a. MT - Mobile Terminal	b. SIM - Subscriber Identity Module	c. Both A and B	d. None	c.

9	What are the main parts of a BSS (Base Station Subsystem) in a GSM network?	a. BTS - Base Transceiver Station	b. BSC - Base Station Controller	c. A and B	d. None	c.
10	What are the main parts of a NSS (Network and Switching Subsystem) of a GSM Architecture?	a. MSC - Mobile Switching Center	b. HLR & AuC	c. VLR, EIR	d. All the above	d.
11	A BTS is also called _____ by general public?	a. Mobile tower	b. Exchange	c. Charging Point	d. None	a.
12	What controller a group of BTS or Cell Towers?	a. BSC	b. MSC	c. HLR	d. VLR	a.
13	What are the functions of a BSC?	a. Handovers, exchange functions	b. Frequency hopping	c. Control of radio frequency power level of BTS	d. All	d.
14	What is the main function of NSS?	a. Establishing communication between mobile and landline numbers.	b. Providing eligible services to the subscriber	c. Providing parameters for Authentication and Encryption	d. All	d.
15	Each SIM is identified by a unique _____ number?	a. IMSI	b. IMEI	c. MSDN	d. None	a.

This sheet is for 2 Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**Correct Answer**
1	What is the name of the database that stores subscriber information under an MSC and his eligible services?	a. MSC	b. HLR	c. EIR	d. AuC	b
2	What is the name of a database used mainly that stores information of a subscriber along with eligible services under roaming or another MSC area?	a. HLR	b. VLR	c. EIR	d. AuC	b
3	Covering area of an MSC is also called ____	a. VLR	b. HLR	c. EIR	d. AUC	b

	?					
4	Usually, VLR contains a copy of data of _____ ?	a. HLR	b. EIR	c. AUC	d. none	a
5	Between VLR and HLR, which one is used mostly allow or bar services to the user?	a. VLR	b. HLR	c. Both are used equally	d. None	a
6	Usually, VLR is part of _____ ?	a. HLR	b. EIR	c. AUC	d. MSC	d
7	As VLR is fast to access, VLR avoids frequent accessing of _____ ?	a. EIR	b. AUC	c. HLR	d. None	c
8	In a GSM architecture, which system provides Authentication and Encryption services?	a. HLR	b. VLR	c. EIR	d. AUC	d
9	In a GSM architecture, which system stores the IMEI numbers of all working mobile phones under the network?	a. HLR	b. VLR	c. EIR	d. AUC	c
10	What are the types of lists maintained by EIR (Equipment Identification Register)?	a. Whitelist	b. Grey List	c. Black List	d. All	d
11	Mobile calls to or from Fixed Networks (Landlines) are handled by _____ ?	a. MSC	b. GMSC (Gateway MSC.	c. HLR	d. VLR	b
12	Each cell in a GSM network has ?	a. Cell number	b. Cell Global number	c. Cell Global Identity number	d. None	c
13	A group of cells in a GSM network has a _____ number.	a. Location number	b. Location Area number	c. Location Area Identity number	d. None	c
14	A single MSC or VLR can have many _____ ?	a. HLR	b. Location Areas (LA)	c. CGI - Cell Global Index	d. None	b
15	Total area served by one network operator is called _____ ?	a. PSTN	b. PLMN	c. LA	d. CGI	b

This sheet is for 3 Mark questions						
S.r No	**Question**	**a**	**b**	**c**	**d**	**Correct Answer**
1	If coherence time of the channel is smaller than the symbol period of the transmitted signal, it is	a. Fast fading	b. Slow fading	c. Frequency selective fading	d. Frequency non selective fading	a
2	In Frequency Selective Fading, the	a. Coherence Bandwidth of the channel is less than bandwidth of transmitted channel	b. Coherence Bandwidth of the channel is more than bandwidth of transmitted channel	c. Coherence Bandwidth of the channel is equal to bandwidth of transmitted channel	d. None of the above	a
3	Flat fading or frequency nonselective fading is a type of	a. Multipath delay spread small scale fading	b. Doppler spread small scale fading	c. Both a & b	d. None of the above	a
4	Coherence time is	a. Directly proportional to Doppler spread	b. Indirectly proportional to Doppler spread	c. Directly proportional to square of Doppler spread	d. Directly proportional to twice of Doppler spread	a
5	To make antenna more directional, either its size must be increased or	a. the number of its feed horns must be increased	b. the frequency of its transmission must be increased	c. its effective isotropic radiated power (EIRP) must be increased	d. its footprint must be increased	b
6	The number of days when Earth's shadow falls on a geosynchronous satellite is	a. 88	b. 277	c. 5	d. 10	a
7	A helical antenna is used for satellite tracking because of	a. Circular polarization	b. Manoeuvrability	c. Beamwidth	d. Gain	a
8	.....is a loss of power of a satellite downlink signal due to earth's	a. Atmospheric loss	b. Path loss	c. Radiation loss	d. RFI	b

	atmosphere.					
9	At present, the radio-frequency band mainly used by most satellites is …….	a. EHF	b. UHF	c. VHF	d. SHF	d
10	Orbital disturbances of a geosynchronous satellite are caused by the	a. moon	b. sun	c. earth	d. all of the above	d

What Does Mobile Assisted Handoff (MAHO) Mean?

A mobile assisted handoff (MAHO) is a process used in GSM cellular networks where a mobile phone assists/helps the cellular base station to transfer a call to another base station. It is a technique used in mobile telecom to transfer a mobile phone to a new radio channel with stronger signal strength and improved channel quality.

Mobile assisted handoff can also be referred to as mobile assisted handover.

Dwell Time :

The time over which a call is maintained within a cell without handoff is called as dwell time. The dwell time of a particular user is governed by a number of factors like propagation, interference, distance between the subscriber and the base station and the other time varying factors.

Spectrum Efficiency :

Spectrum efficiency is the optimized use of spectrum or bandwidth so that the maximum amount of data can be transmitted with the fewest transmission errors. In a cellular telephone network,

spectrum efficiency equates to the maximum number of users per cell that can be provided while maintaining an acceptable quality of service (QoS).

Frequency Reuse :

Frequency reusing is the concept of using the same radio frequencies within a given area, that are separated by considerable distance, with minimal interference, to establish communication.

Frequency reuse offers the following benefits –

1 Allows communications within cell on a given frequency

2 Limits escaping power to adjacent cells

3 Allows re-use of frequencies in nearby cells

4 Uses same frequency for multiple conversations 10 to 50 frequencies per cell

For example, when N cells are using the same number of frequencies and K be the total number of frequencies used in systems. Then each cell frequency is calculated by using the formulae K/N.

In Advanced Mobile Phone Services (AMPS) when K = 395 and N = 7, then frequencies per cell on an average will be 395/7 = 56. Here, cell frequency is 56.

Channel Assignment/Allocation :

Channel Allocation means to allocate the available channels to the cells in a cellular system. When a user wants to make a call request then by using channel allocation strategies their requests are fulfilled. Channel Allocation Strategies are designed in such a way that there is efficient use of frequencies, time slots and bandwidth.

1. Fixed Channel Allocation :

Fixed Channel Allocation is a strategy in which fixed number of channels or voice channels are allocated to the cells. Once the channels are allocated to the specific cells then they cannot be changed. In FCA channels are allocated in a manner that maximize Frequency reuse.

2. Dynamic Channel Allocation :

Dynamic Channel allocation is a strategy in which channels are not permanently allocated to the cells. When a User makes a call request then Base Station (BS) send that request to the Mobile Station Center (MSC) for the allocation of channels or voice channels. This way the likelihood of blocking calls is reduced. As traffic increases more channels are assigned and vice-versa.

3. Hybrid Channel Allocation :

Hybrid Channel Allocation is a combination of both Fixed Channel Allocation (FCA) and Dynamic Channel Allocation (DCA). The total number of channels or voice channels are divided into fixed and dynamic set. When a user make a call then first fixed set of channels are utilized but if all the fixed sets are busy then dynamic sets are used. The main purpose of HCA is to work efficiently under heavy traffic and to maintain a minimum S/I.

Mobile Communication MCQs

Unit 6

1. A field of technology that deals with a combination of real world and the data generated from computer.

A. ML

B. AI

C. AR

D. IoT

Correct Answer: C

Explanation: AR that is Augmented Reality is a field of technology that deals with a combination of real world and the data generated from computer.

2. Technology that completely involve a user inside a synthetic environment.

A. AR

B. VR

C. AI

D. ML

Correct Answer: B

Explanation: The answer is VR or Virtual Reality. VR technologies are known for immersing a user inside a synthetic environment. While immersed, the user cannot see the real world around him.

---

3. A game based on which animated franchise propelled AR into the mainstream in recent years?

A. Pokemon Go

B. Super Mario

C. Legend of Zeldia

D. Sonic The Hedgehog

Correct Answer: A

Explanation: Pokemon Go is a 2016 augmented reality mobile game developed and published by Niantic in collaboration with Nintendo and The Pokémon Company for iOS and Android devices.

---

4. A type of VR environment in which subjects are visually isolated from the real environment.

A. Immersive

B. Semi immersive

C. Non immersive

D. Augmented

View Answer

Correct Answer: A

Explanation: In immersive VR, subjects are visually isolated from the real environment. A virtual scene is responding to the subject's actions.

---

5. In this type of VR environment, the subjects can perform both in the real and virtual environment.

A. Immersive

B. Semi immersive

C. Non immersive

D. Augmented

Correct Answer: B

Explanation: The subjects perceive a strong involvement into the VE. Also, the subjects may perform less in the real environment.

---

6. HMD stands for?

A. Head Mounted Display

B. Head Masked Display

C. Head Made Display

D. Head Mounted Detection

Correct Answer: A

Explanation: It stands for Head Mounted Display. A kind of stereo display with two miniature screens and depth perception.

---

7. In this type of VR environment, the three-dimensional scene is considered as a part of the physical environment.

A. Immersive

B. Semi immersive

C. Non immersive

D. Augmented

Correct Answer: C

Explanation: This happens in non-immersive Virtual environment. Also, the subjects do fully respond in the real environment.

---

8. _____ keep track of position.

A. Motion analysers

B. Motion Trackers

C. HMD

D. SMD

Correct Answer: B

Explanation: Motion trackers keep track of position. Other devices are like head trackers and body trackers.

---

9. A term for Illusion of immersion by projecting stereo images on the walls and floor of a room.

A. CAVE

B. BOOM

C. GUI

D. HMD

Correct Answer: A

Explanation: CAVE is the term. CAVE stands for Cave Automatic Virtual Environment.

---

10. It is a mediated environment which creates the sensation in a user of being present in a (physical) surrounding.

A. WWW

B. VR

C. HMD

D. GUI

Correct Answer: B

Explanation: VR or virtual reality is a mediated environment which creates the sensation in a user of being present in a (physical) surrounding.

---

11. A term to describe the extent to which a user can modify form and content of a mediated environment.

A. Vividness

B. Richness

C. Interactivity

D. Mapping

Correct Answer: C

Explanation: Interactivity is the extent to which a user can modify form and content of a mediated environment. It comprises speed and mapping.

---

12. A tracking based on geo-location information.

A. Location based

B. Marker less

C. Marker based

D. GPS

Correct Answer: A

Explanation: Location based tracking is based on geo-location information obtained from device's location sensors. (Longitude, latitude, altitude etc).

---

13. A technique that enables light field which is generally the product of a light source scattered off objects.

A. AES

B. Holography

C. Cryptography

D. Gyrography

Correct Answer: B

Explanation: Holography enables a light field. It is to be recorded and later reconstructed when the original light field is no longer present.

---

14. Technologies that allow the user to see the real world, with virtual objects composited in the real world.

A. AR

B. VR

C. AI

D. SR

Correct Answer: A

Explanation: Augmented Reality (AR) allows a user to see real world, with virtual objects superimposed or composited with the real world.

---

15. Technologies that completely involve a user inside a synthetic environment.

A. AR

B. VR

C. AI

D. ML

Correct Answer: B

Explanation: The answer is VR or Virtual Reality. VR technologies are known for immersing a user inside a synthetic environment. While immersed, the user cannot see the real world around him.

---

16. Wearable computing device in the form of computerized eyeglasses.

A. HMD

B. Helmets

C. Smart Glasses

D. VR Glasses

Correct Answer: C

Explanation: Smart glasses are also called as optical head mounted displays. (OHMD), it has the capability of reflecting projected images as well as allowing users to see through it.

---

17. What does OFDMA stands for?

A. Original Frequency Division Multiple Access

B. Orthogonal Frequency Division Multiple Access

C. Omitted Frequency Division Multiple Access

D. None

Correct Answer: B

Explanation: OFDMA is an abbreviation for Orthogonal Frequency Division Multiple Access

---

18. What are the advantages of a 4G LTE network over 3G network?

A. More Spectral Efficiency

B. Low power consumption

C. Scalability and Flexibility with other networks

D. All the above

Correct Answer: D

Explanation: All of the above listed features are the advantages of 4G LTE over 3G

---

19. What is the Access technique used by an LTE or LTE-A network?

A. WCDMA

B. FDMA

C. PDMA

D. OFDMA

Correct Answer: D

Explanation: Orthogonal Frequency Division Multiple Access (OFDMA) is the access technique used by an LTE or LTE-A network

---

20. What is the name of a Base Transceiver Station in 2G system equivalent in a 4G LTE system?

A. nodeB

B. eNodeB

C. aNodeB

D. nodeBPro

Correct Answer: B

Explanation:

It is nothing but the tower side equipment that serves its users data and voice.

---

21. What is the other name for a 3GPP2 based 4G network?

A. Super Mobile Broadband (SMB)

B. Advanced Mobile Broadband (AMB)

C. Ultra Mobile Broadband (UMB)

D. None

Correct Answer: C

Explanation:

It is based on CDMA 1xEV-DO technology.

---

22. Initial 4G LTE standard supported Carrier Aggregation. State TRUE or FALSE.

A. TRUE

B. FALSE

Correct Answer: B

Explanation:

Only LTE-A and LTE-A-PRO support Carrier-Aggregation.

---

23. What type of handovers is supported by LTE?

A. Hard handover only

B. Soft handover only

C. Hard and soft handover

D. Hard, soft and softest handover

Correct Answer: A

Explanation: LTE supports only hard handover. It does not receive data from two frequencies at the same time because switching between different carrier frequencies is very fast so soft handover is not required.

---

24. What is the average uploading speed of 4G LTE network?

A. 1-3 Gbps

B. 2-5 Gbps

C. 1-3 Mbps

D. 2-5 Mbps

Correct Answer: D

Explanation: Verizon 4G LTE wireless broadband is 10 times faster than 3G able to handle download speeds between 5 and 12 Mbps (Megabits per second) and upload speeds between 2 and 5 Mbps.

---

25. What does LTE stands for?

A. Level Telecom Advanced

B. Long Terminal Advanced

C. Long Term Evolution

D. Long Time Evolution

Correct Answer: C

Explanation: LTE is abbreviation for Long Term Evolution

---

26. ITU stands for _.

A. International Television Union

B. Internal Telecommunication Union

C. Inventions for Telecommunication Union

D. International Telecommunication Union

Correct Answer: D

Explanation: ITU is abbreviation for International Telecommunication Union

---

27. MulteFire—a new, LTE-based technology that solely operates in _____ spectrum, and doesn't require an "anchor" in licensed spectrum.

A. Licensed

B. Unlicensed

C. Primary

D. Premium

Correct Answer: B

Explanation: The new technology broadens the LTE ecosystem to entities that may not own licensed spectrum, such as Internet Service Providers and enterprise/venue owners.

---

28. Based on 3GPP Release 13 and 14, MulteFire technology supports _____ for fair co-existence with Wi-Fi and other technologies operating in the same spectrum.

A. Hear Before Talk

B. Listen Before Talk

C. Hear Before Speak

D. Speak Before Hear

Correct Answer: B

Explanation: MulteFire technology supports Listen-Before-Talk for fair co-existence with Wi-Fi and other technologies operating in the same spectrum.

---

29. MulteFire is suitable for neutral host services where "_____" can serve "_____" out-of-box, using neutral unlicensed spectrum like 5 GHz.

A. any development, any component

B. any structure, any module

C. any host, any client

D. any deployment, any device.

Correct Answer: D

Explanation: MulteFire is suitable for neutral host services where “any deployment” can serve “any device” out-of-box, using neutral unlicensed spectrum like 5 GHz.

---

30. What are the performance benefits of MulteFire?

A. Enhanced capacity and coverage

B. Security inherent in LTE

C. Full mobility within MulteFire deployments providing quality-of-experience for services such as voice and video

D. All of the above

Correct answer: D

Explanation: Performance benefits of MulteFire in unlicensed spectrum are Enhanced capacity and coverage, Security inherent in LTE, Full mobility within MulteFire deployments providing quality-of-experience for services such as voice and video.

---

31. MulteFire is based on 3GPP R13 LAA?

A. True

B. False

Correct Answer: A

Explanation: MulteFire is based on 3GPP R13 LAA which defines the downlink operation of LTE in unlicensed spectrum when assisted by an anchor in licensed spectrum—also known as supplemental downlink.

---

32. The 5G Automotive Association was created in

A. September 2018

B. September 2016

C. January 2015

D. December 2016

Correct Answer: B

Explanation: The 5G Automotive Association was created in September 2016, by Audi AG, BMW Group

---

33. 5GAA has how many Working Groups?

A. Eleven

B. Nine

C. Thirteen

D. Seven

Correct Answer: D

Explanation: 5GAA has seven Working Groups

---

34. 5GAA primarily focuses on the deployment of cellular based communication, also known as

A. Cellular V2C

B. Cellular V2B

C. Cellular V2D

D. Cellular-V2X

Correct Answer: D

Explanation: 5GAA primarily focuses on the deployment of cellular based communication, also known as Cellular-V2X.

---

35. The 5GAA Working Groups develops

A. 5G frameworks

B. Practical aspects and required standards

C. Business cases for 5G

D. All of the above

Correct Answer: D

Explanation: The 5GAA Working Groups develop the frameworks, practical aspects, required standards, and business cases for 5G and the future application of connected mobility solutions.

---

36. The AA in 5GAA stands for

A. Autonomous Automation

B. Automotive Automation

C. Active Autonomy

D. Actual Automation

Correct Answer: A

Explanation: 5GAA is abbreviation for 5G Autonomous Automation.

---

37. What does 5G stand for?

A. Five gigabytes

B. Fifth gateway

C. Five gigabit

D. Fifth generation wireless

Correct Answer: D

Explanation: 5G is an abbreviation for the fifth generation of wireless cellular technology.

---

38. 5G will offer latency of one millisecond or lower. What does latency refer to?

A. The time it takes to reboot a connection

B. The length of time devices will automatically connect to the network

C. The delay between an input and a desired outcome

D. The speed of detecting a disruption to the network

Correct Answer: C

Explanation: For example, the time it takes to launch an application will be unnoticeable due to 5G's latency.

---

39. To accommodate faster data transmission speeds, 5G has greater bandwidth. What other term is synonymous with bandwidth?

A. Capacity

B. Speed

C. Connection

D. Strength

Correct Answer: A

Explanation: Capacity A misconception is that bandwidth measures speed, but it actually describes the data transfer rate- or capacity.

---

40. Network slicing is a network management feature that 5G will allow. What does this mean users can have?

A. The ability to set up multiple connection points to one 5G network

B. The ability to create multiple virtual networks within a single 5G network

C. The ability to designate multiple passwords for one 5G network

D. The ability to utilize connections from other nearby networks

Correct Answer: B

Explanation: The ability to create multiple virtual networks within a single 5G network Network slicing will allow IoT devices to utilize unique 5G network features based on need or importance.

41. To generate high speeds, 5G utilizes the band of spectrum between 30 GHz and 300 GHz. What is this band of spectrum called?

A. Millimetre wave

B. Lower-frequency spectrum

C. Real-time spectrum

D. Radio-frequency band

Correct Answer: A

Explanation: Millimetre wave Millimetre wave is also known as extremely high frequency or very high frequency.

---

42. 5G will rely on compact, portable base stations that involve minimal power and can be placed in large quantities throughout geographical areas. What are these called?

A. Miniature cells

B. Frequent cells

C. Short-range cells

D. Small cells

Correct Answer: D

Explanation: Small cells Small cell base stations can be placed every 250 meters or so, creating a network of relayed signals.

---

43. A single 5G base station has the ability to send and receive signals from over 22 times the number of users, meaning it has massive MIMO. What does MIMO stand for?

A. Message in message out

B. Multiple in multiple out

C. Multiple input multiple output

D. Message input message output

Correct Answer: C

Explanation: Multiple input multiple output MIMO is used to define wireless network systems that use two or more transmitters and receivers to process more data at once.

---

44. During the testing phase, 5G broke records of spectrum efficiency. What does spectrum efficiency measure?

A. How many base stations can communicate over one spectrum

B. How many bits of data can be transmitted to a certain number of users per second

C. How many users can connect to one network

D. How many connections can run securely at once

Correct Answer: B

Explanation: How many bits of data can be transmitted to a certain number of users per second Spectrum efficiency helps make the most out of a network by increasing the number of users receiving data at once.

---

45. Spectrum efficiency and MIMO rely on a system called beamforming. What does this term refer to?

A. A connectivity system that identifies the closest base station for each user

B. A traffic-signalling system that breaks down data into smaller packets for transport

C. A connectivity system that caps the number of users utilizing the network at once

D. A traffic-signalling system that identifies the route of least interference to deliver data to a user

Correct Answer: D

Explanation: A traffic-signalling system that identifies the route of least interference to deliver data to a user. In short, beamforming creates a higher level of efficiency on the spectrum.

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46. 5G transceivers will incorporate full-duplex technology for data transmission to double the capacity of wireless networks. What does full-duplex mean?

A. The ability to utilize the full capacity of transmission at all times

B. The ability to transmit and receive data at the same time and frequency

C. The ability to incorporate twice the number of transceivers into one base station

D. The ability to become compatible with all types of IoT devices

Correct Answer: B

Explanation: The ability to transmit and receive data at the same time and frequency with full-duplex technology, circuits must be designed to route incoming and outgoing signals to avoid collision.

---

47. Bit error rate provides the information about the type of error.

a) True

b) False

Correct Answer: B

Explanation: Bit error rate does not provide information about the type of error. However, bit error rate (BER) evaluation gives a good indication of the performance of a particular modulation scheme.

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48. Which of the following is specified by a specific number of bit errors occurring in a given transmission?

a) Bit error rate

b) Equally likely event

c) Outage event

d) Exhaustive events

Correct Answer: C

Explanation: Outage event is specified by a specific number of bit errors occurring in a given transmission. Evaluating the probability of outage is one of the means to judge the effectiveness of the signalling scheme in a mobile radio channel.

49. Irreducible BER floor is created in frequency selective channels due to ____

a) Intermoult interference

b) Random spectral spreading

c) Time varying Doppler spread

d) Blind speed

Correct Answer: A

Explanation: Frequency selective fading is caused due to multipath delay spread which causes intersymbol interference. It results in an irreducible BER floor for mobile systems.

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50. Irreducible BER floor is created in non-frequency selective channels due to ____

a) Intersymbol interference

b) Multipath time delay

c) Time varying Doppler spread

d) Blind speed

Correct Answer: C

Explanation: Even if a mobile channel is not frequency selective, the tie varying Doppler spread due to motion creates an irreducible BER floor. It is caused due random spectral spreading.

UNIT V : Current 3G and 4G Technologies for GSM and CDMA

Q1) EDGE is sometimes also referred as _____

a) HSCSD

b) 3GPP

c) EGPRS

d) EGSCSD

Answer: c

Explanation: EDGE is sometimes also referred to as Enhanced GPRS (EGPRS). It is an enhancement of a GSM network in which EDGE is introduced on top of the General Packet Radio Service (GPRS). It is used to transfer data in a packet switched mode on various time slots.

Q2) GPRS and EDGE supports which 2G standard?

a) GSM only

b) IS-136 only

c) GSM and IS-136 both

d) PDC

Answer: c

Explanation: GPRS (General Packet Radio Service) network provides a packet network on dedicated GSM or IS-136 radio channels. EDGE (Enhanced Data rates for GSM Evolution) is also developed keeping in desire both GSM and IS-136 operators.

Q3) Which new modulation technique is used by EDGE?

a) BPSK

b) 8- PSK

c) DQPSK

d) AFSK

Answer: b

Explanation: EDGE uses a new digital modulation format, 8- PSK (Octal Phase Shift Keying). It is used in addition to GSM's standard GMSK (Gaussian Minimum Shift Keying) modulation.

Q4) What is one disadvantage of EDGE in comparison to HSCSD and GPRS?

a) Low data rates

b) Small coverage range

c) Low speed

d) No advancement

Answer: b

Explanation: Because of the higher data rates and relaxed error control covering in many of the selectable air interface formats, the coverage range is smaller in EDGE than in HSCSD or GPRS.

Q5) Which new modulation technique is used by EDGE?

a) BPSK

b) 8- PSK

c) DQPSK

d) AFSK

Answer: b

Explanation: EDGE uses a new digital modulation format, 8- PSK (Octal Phase Shift Keying). It is used in addition to GSM's standard GMSK (Gaussian Minimum Shift Keying) modulation.

Q6)UMTS use which multiple-access technique?

a) CDMA

b) TDMA

c) FDMA

d) SDMA

Answer: a

Explanation: Although UMTS is designed to operate on evolved GSM core networks, it uses code division multiple access (CDMA) for its air interface. The majority of the 3G systems in operation

employ CDMA, while the rest use TDMA. CDMA allows various users to share a channel at the same time, while TDMA allows users to share the same channel by chopping it into different time slots.

Q7) What is the minimum spectrum allocation required by W-CDMA?

a) 5 MHz

b) 20MHz

c) 1.25 MHz

d) 200 KHz

Answer: a

Explanation: W-CDMA/UMTS requires a minimum spectrum allocation of 5 MHz. Using this bandwidth, it has the capacity to carry over 100 simultaneous voice calls. It is able to carry data at speeds up to 2 Mbps in its original format. 20 MHz is the bandwidth defined for LTE. CdmaOne uses a bandwidth of 1.25 MHz. GSM's bandwidth is 200 KHz.

Q8) Which of the following is not a characteristic of Cdma2000?

a) Adaptable baseband signalling rates

b) Adaptable baseband chipping rates

c) Multicarrier technologies

d) OFDMA

Answer: d

Explanation: Cdma2000 does not use OFDMA technique. OFDMA is used by 4G networks. Cdma2000 uses rapidly adaptable baseband signalling rates and chipping rates for each user. It also provides multi-level keying within the same framework.

Q9) Cdma2000 1xEV was developed by _____

a) Motorola

b) AT&T Laboratories

c) Qualcomm

d) NTT

Answer: c

Explanation: Cdma2000 is an evolutionary advancement for CDMA. It was developed by Qualcomm Inc. It is a proprietary high data rate (HDR) packet standard that can be overlaid upon existing IS-95, IS-95B and Cdma2000 networks.

Q10) Which one of the following enables us to use the entire bandwidth simultaneously?

a. TDMA

b. CDMA

c. FDMA

d. All of the above

Answer: b

Explanation: CDMA (or code division multiple access) is a type of multiplexing that allows different signals to occupy only one transmission channel. In short, we can also say that CDMA allows us to use the entire bandwidth simultaneously.

Q11) In which one of the following times is specifically divided into several time slots that are in the fixed patterns?

a. CDMA

b. TDMA

c. FDMA

d. All of the above

Answer: b

Explanation: The TDMA is a type of digital cellular telephone communication technology. It allows the users to use the same frequency without interference. In the TDMA (or Time Division Multiple Access), time is divided into several required time slots that are in the fixed patterns. So the correct answer will be B.

Q12) Which of the following is not a TDMA standard of 2.5G network?

a) HSCSD

b) GPRS

c) EDGE

d) GSM

Answer: d

Explanation: GSM (Global System for Mobile) is a TDMA standard for 2G network. HSCSD (High Speed Circuit Switched Data), GPRS (General Packet Radio Service) and EDGE (Enhanced Data rates for GSM Evolution) are TDMA standards of 2.5G technology.

Q13) The interference between the neighboring base stations is avoided by

a. Assigning different group of channels

b. Using transmitters with different power level

c. Using different antennas

d. All of the above

ANSWER: a. Assigning different group of channels

Explanation: The interference between the neighbouring base stations is avoided by assigning different group of channels and reusing the same channel after a certain amount of distance.

Q14) In which one of the following codes with specific characteristics can be applied to the transmission?

a. CDMA

b. GPRS

c. GSM

d. All of the above

Answer: a

Explanation: The CDMA (or Code Division Multiple Access) is a type of multiplexing which allows various signals to occupy only the transmission channel. It usually optimized the use of the bandwidth in an efficient manner. So the correct answer is CDMA.

Q15) What is the full form of WLAN?

a) Wide Local Area Network

b) Wireless Local Area Network

c) Wireless Land Access Network

d) Wireless Local Area Node

Answer: b

Explanation: WLAN stands for Wireless Local Area Network. Wireless networks are increasingly used as a replacement for wires within homes, buildings, and office settings through the deployment of wireless local area networks (WLANs).

Q16) What is WISP?

a) Wideband Internet Service Protocol

b) Wireless Internet Service Provider

c) Wireless Instantaneous Source Provider

d) Wideband Internet Source Protocol

Answer: b

Explanation: WISP is wireless Internet Service Provider used to explore public LANs (publican). It builds a nationwide infrastructure of WLAN access points in selected hotels, restaurants or airports. It then charges a monthly subscription fee to users who wish to have always on Internet access in those selected locations.

Q17) What is the full form of UMTS?

a) Universal Mobile Telephone System

b) Ubiquitous Mobile Telephone System

c) Ubiquitous Mobile Telemetry System

d) Universal Machine Telemedicine System

Answer: a

Explanation: UMTS (Universal Mobile Telephone System) is a visionary air interface standard that was introduced in 1996. European carriers, manufacturers, and government regulators collectively

developed the early version of UMTS as an open air interface standard for third generation wireless telecommunication.

Q18) UMTS does not has backward compatibility with _____

a) GSM

b) IS-136

c) IS-95

d) GPRS

Answer: c

Explanation: UMTS assures backward compatibility with the second generation GSM, IS-136 and PDC TDMA technologies. It is also compatible with all 2.5G TDMA techniques like GPRS and EDGE. But it does not provide compatibility to CDMA technologies of 2G and 2.5 G. IS-95 is a CDMA standard of 2G.

Q19) UMTS is also known as _____

a) IS-95

b) GPRS

c) CdmaOne

d) W-CDMA

Answer: d

Explanation: UMTS uses Wideband CDMA (W-CDMA) to carry the radio transmissions. Therefore, it is also referred to as W-CDMA. W-CDMA offers greater spectral efficiency and bandwidth to mobile network operators.

Q20) How much increase in spectral efficiency is provided by W-CDMA in comparison to GSM?

a) Two times

b) Three times

c) No increase

d) Six times

Answer: d

Explanation: W-CDMA can provide at least six times an increase in spectral efficiency over GSM at system level. Such a wider bandwidth is chosen to higher data rates as low as 8 kbps to as high as 2 Mbps on a single 5 MHz W-CDMA radio channel.

Q21) W-CDMA requires a complete change of RF equipment at each base station.

a) True

b) False

Answer: a

Explanation: W-CDMA is designed to provide backward compatibility and interoperability for all GSM, IS-136/PDC, GPRS and EDGE equipment. But due to a wider air interface bandwidth of W-CDMA, it requires a complete change of RF-equipment at each base station.

Q22) W-CDMA works in FDD mode only.

a) True

b) False

Answer: b

Explanation: W-CDMA works in both FDD and TDD mode. W-CDMA developed for wide area cellular coverage uses FDD. And TDD is used by W-CDMA for indoor cordless type applications.

Q23) What is the chip rate of W-CDMA?

a) 1.2288 Mcps

b) 3.84 Mcps

c) 270.833 Ksps

d) 100 Mcps

Answer: b

Explanation: W-CDMA uses a chip rate of 3.84 Mcps. Chip rate is the product of symbol rate and spreading factor. If the symbol rate is 960 Kbps and spreading factor is 4 for W-CDMA, then the chip rate is 3.84 Mcps. The chip rate for Cdma2000 and GSM are 1.2288 Mcps and 27.0833 Ksps respectively.

Q24) US digital cellular system based on CDMA was standardized as _____

a) IS-54

b) IS-136

c) IS-95

d) IS-76

Answer: c

Explanation: A US digital cellular system based on CDMA was standardized as Interim Standard 95 (IS-95). It was standardized by US Telecommunication Industry Association (TIA) and promised increased capacity.

Q25) User data in IS-95 is spread to a channel chip rate of _____

a) 1.2288 Mchip/s

b) 9.6 Mchip/s

c) 12.288 Mchip/s

d) 0.96 Mchip/s

Answer: a

Explanation: User data is spread to a channel chip rate of 1.2288 Mchip/s (a total spreading factor of 128) using a combination of techniques. The spreading process is different for the forward and reverse links in the original CDMA specification.

26) What does LTE stands for?

A) Level Telecom Advanced

B) Long Terminal Advanced

C) Long Term Evolution

D) Long Time Evolution

ANS (C) Long Term Evolution

Explanation: GPP engineers named the technology "Long Term Evolution" because it represents the next step (4G) in a progression from GSM, a 2G standard, to UMTS, the 3G technologies based upon GSM.

27) Though LTE is treated as a 4G (Fourth Generation) network, it is actually a ___ generation technology as it does not meet expectations.

A) 2.5G

B) 3G

C) 3.5G

D) 3.9G

ANS (D) 3.9G

28) What is the Access technique used by an LTE or LTE-A network?

A) WCDMA

B) FDMA

C) PDMA

D) OFDMA

ANS D) OFDMA

Explanation: For the LTE uplink, a different concept is used for the access technique.

Although still using a form of OFDMA technology, the implementation is called Single Carrier Frequency Division Multiple Access (SC-FDMA).

One of the key parameters that affects all mobiles is that of battery life.

29) What does OFDMA stands for?

A) Original Frequency Division Multiple Access

B) Orthogonal Frequency Division Multiple Access

C) Omitted Frequency Division Multiple Access

D) None

ANS: B) Orthogonal Frequency Division Multiple Access

Explanation: Orthogonal Frequency Division Multiple Access. OFDMA is the multi-user variant of the OFDM scheme where multiple access is achieved by assigning subsets of time-frequency resources to different users, allowing simultaneous data transmission from several users

30) What is the carrier Bandwidth in a typical 3G WCDMA-based network?

A) 1.4 Mhz

B) 3MHz

C) 5 MHz

D) 10 MHz

ANS C) 5 MHz

Explanation: UMTS uses Wideband CDMA - WCDMA - as the radio transmission standard.

It employs a 5 MHz channel bandwidth. Using this bandwidth it has the capacity to carry over 100 simultaneous voice calls,

or it is able to carry data at speeds up to 2 Mbps in its original format.

31) IMT-A (International Mobile Telecommunications Advanced) is _____.

A) LTE-A (LTE Advanced)

B) The system that implements specifications of ITU-R(ITU Radiocommunication)

C) Also known as 4.5G

D) All the above

ANS D) All the above

32) What is the other name for a 3GPP2 based 4G network?

A) Super Mobile Broadband (SMB)

B) Advanced Mobile Broadband (AMB)

C) Ultra Mobile Broadband (UMB)

D) None

ANS C) Ultra Mobile Broadband (UMB)

Explanation: **Ultra Mobile Broadband** (**UMB**) is a leading **mobile broadband** Orthogonal Frequency Division Multiple Access (OFDMA) solution that utilizes wider bandwidths (up to 20 MHz) to produce an **ultra** fast user experience.It is based on CDMA 1xEV-DO technology.

33) Which technology among the following offers High-Speed Packet Data?

A) CDMAOne

B) CDMA2000 1x

C) CDMA 1xEV

D) None

ANS C) CDMA 1xEV

Explanation:

CDMA 1xEV is the same as CDMA 1xEVDO.

34) Selecting a data rate for a Forward Channel or Reverse Channel is based on the ___ Ratio.

A) A/B

B) VSWR

C) C/I

D) None

ANS C) C/I

Explanation:

C/I = Carrier/Interference. It is pronounced as C BAR I ratio.

35) In a 1xEV-DO network, Reverse Links are implemented with ___ multiplexing.

A) Time Division

B) Code Division

C) Time Division and Code Division

D) None

ANS B) Code Division

Explanation:

Only the Forward links are implemented with both CDMA and TDM techniques.

36) What are the channels used in a CDMA 1xEVDO network?

A) Access channels similar to CDMA2000 1x systems

B) Similar to Enhanced Access channels of CDMA2000 1x

C) DeAccess channels

D) None

ANS A) Access channels similar to CDMA2000 1x systems

Explanation:

Only the plain CDMA2000 1x network uses both the Access channels and Enhanced Access channels.

37) Who gave the TIA-856 name to the 1xEV-DO standard?

A) ANSI

B) ITU

C) 3GPP

D) None

ANS B) ITU

Explanation:

ITU (International Telecommuniation Union)

38) SIM in a 3G network is called _____?

A) Micro SIM

B) Nano SIM

C) USIM

D) RSIM

ANS C) USIM

Explanation:

USIM = User SIM

39) What is the name of BSC equivalent part in a 3G mobile network?

A) Controller

B) Radio Switch Controller

C) Radio Network Controller

D) Radio Command Center

ANS C) Radio Network Controller

Explanation:

RNC = Radio Network Controller

40) A UMTS(Universal Mobile Telecommunication) network is a ___ network.

A) First Generation

B) Second Generation

C) Third Generation

D) Fourth Generation

ANS C) Third Generation

41) What is the maximum data rate supported by a 3G network or UMTS network?

A) 384 kbps

B) 2 Mbps

C) 32 Mbps

D) 42 Mbps

ANS D) 42 Mbps

42) State TRUE or FALSE. Closed-Loop Power Control is efficient than Open Loop Power Control.

A) FALSE

B) TRUE

ANS B) TRUE

Explanation:

As the Node-B sends power control bits every 0.66 ms to all Mobile Stations, power is adjusted immediately. It saves battery life.

43) If a 3G tower has 3 antennae, what is the total number of pilot frequencies under the tower?

A) 1

B) 3

C) 6

D) 8

ANS A) 1

Explanation:

Since it is code division multiplexing, one frequency is sufficient.

44)3G networks with TD-SCDMA technology are deployed mainly in ___ country.

A) Russia

B) China

C) Finland

D) USA

ANS B) China

Explanation:

SCDMA (Synchronous CDMA) was invented by CATT(Chinese Academy of Telecommunications Technology) to avoid licensing fee to other countries and save money.

45) What are the advantages of a TD-SCDMA-enabled 3G network?

A) Variable number of downlink and uplink channels with flexibility for support uneven traffic

B) Any spectrum (Spread Spectrum) can be used.

C) Sudden traffics can be augmented easily.

D) All the above

ANS D) All the above

46) What is the type of ARQ (Automatic Repeat Request) followed by a CDMA2000 1xEVDO network?

A) Hybrid ARQ

B) Redundancy ARQ

C) Incremental Redundancy Hybrid ARQ

D) None

ANS C) Incremental Redundancy Hybrid ARQ

47) What is the name given to a 4G LTE or UMB based Core Network Architecture?

A) SAE (System Architecture Evolution)

B) SAP (System Architecture Pro)

C) CAS (Core System Architecture)

D) None

ANS A) SAE (System Architecture Evolution)

48) What does AAS represent in a UMB (Ultra Mobile Broadband) based 4G network?

A) Antenna Average System

B) Advanced Antenna System

C) Analog Amplitude System

D) None

ANS B) Advanced Antenna System

49) The Evolution-Data Optimized Voice (EVDV) based 4G networks are according to ___ standards. (3GPP / 3GPP2)

A) 3GPP

B) 3GPP2

C) ANSI

D) ITU

ANS: A) 3GPP

Explanation:

3GPP is an acronym for Third Generation Partnership Projects.

50) The Forward Link Scheduling algorithm is also called ___ as it guarantees minimum service to all users.

A) Hybrid Algorithm

B) Kries Algorithm

C) Proportional Fair algorithm

D) None

ANS C) Proportional Fair algorithm

Unit 4 – GSM

Q1) Which of the following is the world's first cellular system to specify digital modulation and network level architecture?

Options:-
a) GSM
b) AMPS
c) CDMA
d) IS-54

Correct Answer: option a

Explanation: GSM was the world's first cellular system to specify digital modulation and level architectures and services. It is the world's most popular 2G technology. It was developed to solve the fragmentation problems of the first cellular systems in Europe.

Q2) Previously in 1980s, GSM stands for _____

Options:-

a) Global system for mobile
b) Groupe special mobile

c) Global special mobile
d) Groupe system mobile

Correct Answer: option b

Explanation: In the mid-1980s GSM was called by the name Groupe special mobile. In 1992, GSM changed its name to Global System for Mobile Communication for marketing reasons.

Q3) Who sets the standards of GSM?

Options:-
a) ITU
b) AT & T
c) ETSI
d) USDC

Correct Answer:- option c

Explanation: The setting of standards for GSM is under the aegis of the European Technical Standards Institute (ETSI). GSM task was to specify a common mobile communication system for Europe in the 900 MHZ band.

Q4) Which of the following does not come under the teleservices of GSM?

Options:-

a) Standard mobile telephony
b) Mobile originated traffic
c) Base originated traffic
d) Packet switched traffic

Correct Answer: option d
Explanation: GSM services follow ISDN guidelines and are classified as either teleservices or data services. Teleservices include standard mobile telephony and mobile originated or base originated traffic.

Q5) Which of the following comes under supplementary ISDN services?

Options:-
a) Emergency calling
b) Packet switched protocols
c) Call diversion
d) Standard mobile telephony

Correct Answer: option c
Explanation: Supplementary ISDN services are digital in nature. They include call diversion, closed user groups, and caller identification, and are not available in analog mobile networks. Supplementary services also include short messaging service (SMS).

Q6) Which of the following memory device stores information such as subscriber's identification number in GSM?

Options:-
a) Register
b) Flip flop
c) SIM
d) SMS

Correct Answer: option c
Explanation: SIM (subscriber identity module) is a memory device that stores information such as the subscriber's identification number, the networks and countries where the subscriber is entitled to service, privacy keys, and other user specific information.

Q7) Which of the following feature makes impossible to eavesdrop on GSM radio transmission?

Options:-
a) SIM
b) On the air privacy
c) SMS
d) Packet switched traffic

Correct Answer: option b
Explanation: The on the air privacy feature of GSM makes impossible to eavesdrop on a GSM radio transmission. The privacy is made possible by encrypting the digital bit stream sent by a GSM transmitter, according to a specific secret cryptographic key that is known only to the cellular carrier.

Q8) Which of the following does not come under subsystem of GSM architecture?

Options:-

a) BSS
b) NSS
c) OSS
d) Channel

Correct Answer: option d
Explanation: The GSM architecture consists of three major interconnected subsystems that interact between themselves and with the users through certain network interfaces. The subsystems are BSS (Base Station Subsystem), NSS (Network and Switching Subsystem) and OSS (Operation Support Subsystem).

Q9) Which of the following subsystem provides radio transmission between mobile station and MSC?

Options:-
a) BSS
b) NSS
c) OSS
d) BSC

Correct Answer: option a
Explanation: The BSS provides and manages radio transmission paths between the mobile stations and the Mobile Switching Center (MSC). It also manages the radio interface between the mobile stations and all other subsystems of GSM.

Q10) _____ manages the switching function in GSM.

Options:-
a) BSS
b) NSS
c) OSS
d) MSC

Correct Answer: option b
Explanation: NSS (Network and Switching Subsystem) manages the switching functions of the system. It allows the MSCs to communicate with other networks such as PSTN and ISDN.

Q11) _____ supports the operation and maintenance of GSM.

Options:-
a) BSS
b) NSS
c) OSS
d) MSC

Correct Answer: option c
Explanation: The OSS (Operation Support Subsystem) supports the operation and maintenance of GSM. It allows system engineers to monitor, diagnose, and troubleshoot all aspects of GSM.

Q12) _____ carries digitally encoded user data.

Options:-
a) Traffic channels
b) Control channels
c) Signalling channels
d) Forward channels

Correct Answer: option a
Explanation: Traffic channels carry digitally encoded user speech or user data. It has identical functions and formats on both the forward and reverse links.

Q13) _____ carries signalling and synchronizing commands.

Options:-
a) Traffic channels
b) Control channels
c) Signalling channels
d) Forward channels

Correct Answer: option b
Explanation: Control channels carry signalling and synchronizing commands between the base station and mobile station. Certain types of control channels are defined for just the forward or reverse link.

Q14) Which of the following is not a control channel of GSM?

Options:-
a) BCH
b) CCCH
c) DCCH
d) TCH

Correct Answer: option d
Explanation: There are three main control channels in the GSM system. These are the broadcast channel (BCH), the common control channel (CCCH) and the dedicated control channel (DCCH). Each control channel consists of several logical channels.

Q15) Which of the following is the forward control channel that is used to broadcast information?

Options:-
a) BCCH
b) CCCH

c) DCCH
d) TCH

Correct Answer: option a
Explanation: The broadcast control channel (BCCH) is a forward channel that is used to broadcast information such as cell and network identity, and operating characteristics of the cell.

Q16) Which of the following channel does not come under CCCH?

Options:-
a) PCH
b) RACH
c) DCCH
d) AGCH

Correct Answer: option c
Explanation: CCCH consists of three different channels. They are paging channel (PCH), which is a forward link channel, the random access channel (RACH) which is a reverse link channel, and the access grant channel (AGCH) which is a forward link channel.

Q17) Which of the following channel provides paging signals from base station to all mobiles in the cell?

Options:-
a) RACH
b) AGCH
c) DCCH
d) PCH

Correct Answer: option d
Explanation: The PCH provides paging signals from the base station to all mobiles in the cell. It notifies a specific mobile of an incoming call which originates from the PSTN.

Q18) _____ is a reverse link channel used by a subscriber unit to acknowledge.

Options:-
a) RACH
b) AGCH
c) DCCH
d) PCH

Correct Answer: option a
Explanation: The RACH (Random Access Channel) is a reverse link channel used by a subscriber unit to acknowledge a page from the PCH. It is also used by mobiles to originate a call.

Q19) Which of the following channel is used by base station to provide forward link communication to mobile?

Options:-
a) RACH
b) AGCH
c) DCCH
d) PCH

Correct Answer: option b
Explanation: The AGCH (Access Grant Channel) is used by the base station to provide forward link communication to the mobile. It carries data which instructs the mobile to operate in a particular physical channel with particular dedicated control channel.

Q20) Which of the following burst is used to broadcast the frequency and time synchronization control messages?

Options:-
a) FCCH and SCH
b) TCH and DCCH
c) RACH and TCH
d) FCCH and DCCH

Correct Answer: option a
Explanation: FCCH and SCH burst are used to broadcast the frequency and time synchronization control messages. They are used in TS0 of specific frames.

Q21) Which of the following burst is used to access service from any base station?

Options:-
a) TCH
b) RACH
c) SCH
d) FCCH

Correct Answer: option b
Explanation: Each user transmits a burst of data during the time slot assigned to it. The RACH burst is used by all mobiles to access service from any base station, and dummy burst is used as filter information for unused timeslots on forward link.

Q22) Group of superframes in GSM is called multiframe.

Options:-
a) True
b) False

Correct Answer: option b
Explanation: Each of the normal speech frames are grouped into larger structures called multiframes. These multiframes are grouped into superframes and hyperframes.

Q23) What is the total number of Carrier Frequencies that can be formed in a 25MHz band width of either Uplink or Downlink of GSM?

Options:-

A) 128

B) 126

C) 124

D) None

Correct Answer:- option C

Explanation:- The method chosen by GSM is a combination of Time- and Frequency-Division Multiple Access (TDMA/FDMA). The FDMA part involves the division by frequency of the (maximum) 25 MHz bandwidth into 124 carrier frequencies spaced 200 kHz apart.

Q24) What is the spacing between each carrier frequency to avoid interference and crosstalk?

Options:-

A) 100KHz

B) 200KHz

C) 128KHz

D) 256KHz

Correct Answer:- option b

Explanation:- The method chosen by GSM is a combination of Time- and Frequency-Division Multiple Access (TDMA/FDMA). The FDMA part involves the division by frequency of the (maximum) 25 MHz bandwidth into 124 carrier frequencies spaced 200 kHz apart.

Q25) In GSM-1800 band, the total number of Carrier Frequencies are ?

Options:-

A) 124

B) 248

C) 374

D) 448

Correct Option:- option C

Explanation:- 375 x 200KHz = 75 MHz

Q26) In a GSM-900 Band, what is the duplex spacing between uplink and downlink channels?

Options:-

A) 25MHz

B) 35MHz

C) 45MHz

D) None

Correct Answer:- option C

Explanation:-GSM-900 uses 890 - 915 MHz to send information from the Mobile Station to the Base Transceiver Station (BTS) (This is the “uplink”) and 935 - 960 MHz for the other direction (downlink), providing 124 RF channels spaced at 200 kHz. Duplex spacing of 45 MHz is used.

Q27) In a GSM-1800 Band, what is the duplex spacing between downlink and uplink channels?

Options:-

A) 75MHz

B) 85MHz

C) 95MHz

D) None

Correct Answer: Option C

Explanation:- GSM-1800 uses 1710 - 1785 MHz for the uplink and 1805 - 1880 downlink, providing 299 channels. Duplex spacing is 95 MHz.

Q28) What are the types of Logical channels in a GSM Structure or Architecture?

Options:-

A) Traffic channels

B) Broadcasting channels

C) control channels

D) All

Correct Answer: option d

Explanation: There are three types of logical channels: traffic channels (TCHs), control channels (CCHs), and the cell broadcast channel (CBCH).

Q29) Broadcasting is a concept of transferring information from _____ to _____?

Option:-

A) One to one

B) Many to one

C) One to many

D) Many to many

Correct Answer:- option c

Explanation: A BTS broadcasts a BCCH to all eligible mobiles for further negotiation.

Q30) What is the total bitrate after channel coding in a Half Rate TCH channel?

Options:-

A) 11.4kbps

B) 22.8kbps

C) 34.2kbps

D) None

Correct Answer: option a

Explanation: A GSM half rate channel uses 12 frames out of a 26-multiframe. The channel bit rate of a half-rate GSM channel is 11.4 kbit/s, although the actual data capacity is 4.8-7 kbit/s, depending on the channel coding.

Q31) What is the duration of a GSM TDMA Frame?

Options:-

A) 4.614ms

B) 5.614ms

C) 6.614ms

D) None

Correct Answer:- Option a

Explanation:- A GSM Multiframe is the basic unit, and is 120 ms long. There are 26 Frames in each Multiframe, with each Frame being 4.61538 ms long (120 ms/26).

Q32) BCCH (Broadcast Control Channel) frequency is also called _____?

Options:-

A) Engine

B) Driver

C) Pilot

D) None

Correct Answer:- Option c

Explanation: Pilot is another name of BCCH frequency.

Q33) Majority of the GSM Channels work on _____ interface?

Options:-

A) Abis interface

B) A interface

C) Um interface

D) M interface

Correct Answer:- option c

Explanation:- Um interface is also called Air interface. It works in between Mobile and BTS.

Q34) The type of information transferred in Traffic Channel (TCH) is ____ ?

Options:-

A) Voice

B) Data

C) Both Voice and Data

D) Signalling

Correct Answer:- Option c

Explanation:- Voice and Data are the type of information transferred in Traffic Channel.

Q35) What are the data rates of services available in ISDN and other services that can be transmitted in a TCH channel?

Options:-

A) 2.4kbps

B) 4.8kbps

C) 9.6kbps

D) All

Correct Answer:- Option D

Explanation:- With a TCH-Full rate (TCH/F), the maximum effective data rate possible is 9.6 Kbps. With a TCH-Half rate (TCH/H), the maximum data rate is 4.8 Kbps. The GSM PLMN also provides high-speed circuit switched data (HSCSD), which combines multiple TCH/Fs and can provide a maximum data rate of 56 Kbps.

Q36) Choose a Broadcast channel in GSM Architecture?

Options:-

A) BCCH (Broadcast Control Channel)

B) FCCH (Frequency Correction Channel)

C) SCH (Synchronization Channel), CBCH (Cell Broadcast Channel)

D) All

Correct Answer:- Option d

Explanation :- Broadcast Control Channel, Frequency Correction Channel, Synchronization Channel and Cell Broadcast Channel are Broadcast channel in GSM Architecture.

Q37) Choose a Broadcast Channel below.

Options:-

A) PCH (paging Channel)

B) AGCH (Access Grant Channel)

C) RACH (Random Access Channel)

D) None

Correct Option :- Option D

Explanation:- FCCH, SCH and CBCH are Broadcast Channel.

Q38) The channel BCCH is always defined in which time slot?

Options:-

A) Timeslot 0

B) Timeslot 1

C) Timeslot 4

D) Timeslot 8

correct Option:- Option A

Explanation:- Note that the BCCH is always transmitted in timeslot 0 on the first defined frequency.

Q39) If there are two TRX in a given Sector or Cell, BCCH is defined on the _____ TRX or frequency.

Options:-

A) First

B) Second

C) First or second

D) First and second

Correct Option:- Option A

Explantion:- Only first frequency is chosen for BCCH.

Q40) How many timeslots are present in a GSM TDMA frame whose time duration is 4.615ms?

Options:-

A) 4

B) 8

C) 16

D) 32

Correct Option:- Option B

Explanation:- 8 x 0.577ms = 4.615ms

Q41) What are the TDMA Multi frames used for TCH/H and TCH/F ?

Options:-

A) 26 TDMA frames

B) 51 TDMA frames

C) 26 or 51 TDMA frames

D) None

Correct Option:- Option C

Explanation:- traffic channel (TCH) is used to carry speech and data traffic. Traffic channels are

defined using a 26-frame multi frame, or group of 26 TDMA frames. The length of a

26-frame multi frame is 120ms. Out of the 26 frames, 24 are used for traffic, 1 is

used for the slow associated control channel.

Q42) Which is TRUE about maximum length of an SMS in a GSM network?

Options:-

A) 160 7-bit characters

B) 140 8-bit characters

C) 70 16-bit characters

D) All

Correct Option:- Option D

Explanation:- User can configure Support for Characters in SMS settings. Most of the phones display "Limited Character Set" or "Full Character Set" options or "Use Simple Characters" etc.

Q43) What is the maximum number of SMS that can be sent to a Mobile in one minute time?

Options:-

A) 1-5

B) 6-10

C) 11-15

D) 15-20

Correct Option:- Option B

Explanation:-To limit a modem to 10 messages per minute, define a limit of 10 messages per 60 seconds or 1 messages per 6 seconds.

Q44) Power control feature aims at receiving all bursts of transmission at _____ power level.

Options:-

A) Different

B) Variable

C) Same

D) None

Correct Option:- Option c

Explanation:- If different transmissions arrive at different power level, it causes interference.

Q45) What is the transmission bitrate between BTS and BSC?

Options:-

A) 8kbps

B) 16kbps

C) 32kbps

D) 64kbps

Correct Option:- Option B

Explanation:- TRAU multiplexes 16kbps bursts up to 64kbps before sending to MSC.

Q46) IMSI comprises of which parts_____

Options:-

A)MMC

B)CI

C)LAI

D)None

Correct Option: Option A

Explanation: In three parts IMSI comprises i.e. MMC, MNC and MSIN.

Q47) Radio transmitter in the base station of cellular communication contains____

Options:

A) Monopole
B) Guy wire
C) Audio processing

D) Free standing

Correct Option: Option C

Explanation: Radio transmitter in the base station of cellular communication contains of audio processing, Modulation and RF power amplifier assemblies.

Q48) GSM cellular communication system can operate in which frequency band?

Options:

A)400 MHz

B)200 MHz

C)1000 MHz

D) None

Correct Option : Option A

Explanation: GSM cellular communication system can operate in several band i.e. 400 MHz, 800 MHz, 900 MHz, 1800 MHz and 1900 MHz frequency bands.

Q49) which of the following is not in GSM transmitter System?

Options:

A) Segmentation
B) Channel coding
C) Guard band frequency
D) Interleaving

Correct Answer: Option c

Explanation: GSM transmission process steps are 1. A/D conversion, 2. Segmentation, 3 speech coding, 4 channel coding, 5 Interleaving, 6 Burst formatting, 7 encryption and Modulation and transmission.

Q50) Q50) What is the duration of a HYPERFRAME?

Options:

A) 3H 28M 2.2S

B) 3H 28M 50S

C) 3H 28M 53.76s

D) 3.5H

Correct Answer: Option C

Explanation: The longest recurrent time period of the structure is called hyperframe and has a duration of 3 h 28 mn 53 s 760 ms (or 12 533,76 s).

Unit 1: Introduction to Cellular Networks

Q1. 1G or First Generation Mobile Network is____?

A) Analog
B) Digital
C) Sequential
D) Fuzzy

Correct Answer – A

1G is analog. 2G is digital.

Q2. In a 1G network, the type of communication between Tower to BTS and Switching Center is _____?
A) Analog
B) Digital
C) Discrete
D) Diminished
Answer: B
Digital

Q3. What are main problems in 1G technology?
A) Noise
B) Security
C) Poor Battery backup
D) All the above

Answer: D

Noise, Security, Poor Battery Backup

Q4. What is the Cell Size or Coverage Area in 1G technology?
A) 1-5Km
B) 20-60Km
C) 5-50Km
D) 2-30Km
Answer: D
2-30 Km
Explanation: 1G network covers a lot of area. With less number of towers or BTS, you can achieve robust coverage.

5. Which of the following is supported data rates of 4G Networks?

a. 1024kbps

b. 100mbs

c. 200mbps

d. None of the above

Answer: b

Explanation: The rate of data transfer or speed of the 4G network is approximately 100mbps, which is 20 times faster than that of 3G networks. The maximum speed of the 4g network is about 300mbps or more, but such speed is only achievable in well-controlled laboratory environments. So the correct answer will be B.

6. When was the 2G communication introduced in the market?

a. 1982

b. 1984

c. 1986

d. 1988

Answer: d

Explanation: The 2G communication was first launched in early 1988 in the market. So the correct answer is D.

7. PCS/PCN provides only wired communication.
a) True
b) False

Answer: b
Explanation: The objective of personal communication systems (PCS) or personal communication networks (PCNs) is to provide ubiquitous wireless communications coverage, enabling users to access telephone network and Internet.

8. Concept of PCS/PCN is based on _____
a) Advanced intelligent network
b) Artificial intelligent network
c) CDPD
d) SS7

Answer: a
Explanation: The concept of PCS/PCN is based on an advanced intelligent network (AIN). The mobile and fixed networks will be integrated to provide universal access to the network and its databases.

9. Circuit switching has more advantage than packet switching for PCS.
a) True
b) False

Answer: b
Explanation: Packet switching technology will have more advantages for PCS/PCN than circuit switching. PCS is required to serve a wide range of services including voice, data, e-mail and digital video.

10._____ is used for transmission of packets in the cellular switched architecture.
a) Packet switching techniques
b) Circuit switching techniques
c) Packet and circuit switched technique
d) Datagram technique

Answer: a
Explanation: Packet switching techniques are used for transmission of packets in the cellular switched architecture. Packet switching is attractive for wireless networks because the addresses and other information in packet headers make it possible for dispersed network elements to respond to a mobile user without intervention central controllers.

11. The 2G cellular network uses
a. TDMA/FDD
b. CDMA/FDD
c. Digital modulation formats
d. All of the above
ANSWER: All of the above

12. 2G standards support
a. Limited internet browsing
b. Short Messaging Service
c. Both a & b
d. None of the above
ANSWER: Both a & b

13. The shape of the cellular region for maximum radio coverage is
a. Circular
b. Square
c. Oval
d. Hexagon
ANSWER: Hexagon

14. Hexagon shape is used for radio coverage for a cell because

a. It uses the maximum area for coverage
b. Fewer number of cells are required
c. It approximates circular radiation pattern
d. All of the above
ANSWER: All of the above

15. The process of transferring a mobile station from one base station to another is
a. MSC
b. Roamer
c. Hand off
d. Forward channel
ANSWER: Hand off

16. Which of the following memory device stores information such as subscriber's identification number in GSM?
a) Register
b) Flip flop
c) SIM
d) SMS

Answer: c
Explanation: SIM (subscriber identity module) is a memory device that stores information such as the subscriber's identification number, the networks and countries where the subscriber is entitled to service, privacy keys, and other user specific information.

17. Which of the following subsystem provides radio transmission between mobile station and MSC?
a) BSS
b) NSS
c) OSS
d) BSC

Answer: a
Explanation: The BSS provides and manages radio transmission paths between the mobile stations and the Mobile Switching Center (MSC). It also manages the radio interface between the mobile stations and all other subsystems of GSM.

18. _____ manages the switching function in GSM.
a) BSS
b) NSS
c) OSS
d) MSC

Answer: b
Explanation: NSS (Network and Switching Subsystem) manages the switching functions of the system. It allows the MSCs to communicate with other networks such as PSTN and ISDN.

19) What are the three main parts of a GSM Architecture or Structure?
A) Mobile Station
B) BSS - Base Station Subsystem
C) NSS - Network and Switching Subsystem
D) All the above
Answer: D

20) What are the main parts of a Mobile Station in a GSM Network?
A) ME - Mobile Equipment (ME)
B) SIM - Subscriber Identity Module
C) Both A and B
D) None
Answer: C

21) What are the main parts of a BSS (Base Station Subsystem) in a GSM network?
A) BTS - Base Transceiver Station
B) BSC - Base Station Controller
C) A and B
D) None
Answer: C

22) What are the main parts of an MSC (Mobile Switching Centre) system in a GSM structure?

A) MGW - Media Gateway

B) MSC Server

C) Both A and B

D) None

Answer: C

Explanation: Draft the function of system of call and the commutation, the advance of call, the information of invoicing and the collection of base

23) What is the name of the database that stores subscriber information under an MSC and his eligible services?
A) MSC
B) HLR

C) EIR
D) AUC
Answer: B

Explanation: HLR also stores the location of a customer.

24) What is the name of a database used mainly that stores information of a subscriber along with eligible services under roaming or another MSC area?
A) HLR
B) VLR
C) EIR
D) AUC
Answer: B
Explanation: A visitor location register (VLR) is a server in a cellular network that supports roaming functions for users outside the coverage area of their own HLR.

25) Covering area of an MSC is also called ____ ?
A) VLR
B) HLR
C) EIR
D) AUC
Answer: B

26. Which of the following stores all the user-related data that is relevant for the GSM system in mobile computing?

1. SIM
2. HLR
3. ELR
4. VLR

Answer: 1

Explanation: Subscriber Identity Module stores all customer related information.

27. Which of the following stores Mobile Subscriber ISDN number – MSISDN?

1. Home location register
2. Visitor location register
3. Entity equipment register
4. None of the above

Answer 1

28. The base station covers a specific area that is called a ——

1. Cell
2. Tessellate
3. Mobile station
4. None of the above

Answer 1

Explanation: A mobile phone **base station** provides coverage to a geographic **area** known as a “cell”. Cells are aligned next to each other in a similar pattern to a honeycomb, and it is for this reason that mobile phone networks are sometimes referred to as “cellular” networks.

29. In a cellular system, the shape of the cell depends on —–

1. Environmental conditions
2. Social conditions
3. Political conditions
4. None of the above

Answer: 1

30. _____ is defined as the ratio of desired signal power to undesired noise power.
a) Signal to noise ratio
b) Noise to signal ratio
c) Noise figure
d) Noise temperature

Answer: a
Explanation: SNR is defined as the ratio of desired signal power to undesired noise power, and so is dependent on the signal power. When noise and a desired signal are applied to the input of a noise less network, both noise and signal will be attenuated or amplified by the same factor, so that the signal to noise ratio will be unchanged.

31. _____ is defined as the ratio of input signal to noise ratio to the output signal to noise ratio.
a) Noise figure
b) Noise temperature
c) SNRo
d) None of the mentioned

Answer: a

Explanation: Noise figure is defined as the ratio of input signal to noise ratio to the output signal to noise ratio of a system or a receiver. SNR_i is the signal to noise ratio measured at the input terminals of the device. SNR_0 is the output signal to noise ratio measured at the output terminals of the device.

Q32. The broad spectrum of the transmitted signal gives rise to
a). Fading
b). Noise
c). Spread Spectrum
d). All of the above
Answer: C
Explanation: **spread-spectrum** techniques are methods by which a signal (e.g., an electrical, electromagnetic, or acoustic signal) generated with a particular bandwidth is deliberately **spread** in the frequency domain, resulting in a signal with a wider bandwidth.

Q33. What is channel assignment?

a) For efficient utilization of radio spectrum a frequency reuse scheme with increasing capacity and minimizing interference is required.
b) For efficient utilization of radio spectrum a frequency reuse scheme with increasing capacity and maximizing interference is required.
c) a & b
d) None of the above

Answer: A

Explanation: Channel Allocation means to allocate the available **channels** to the cells in a **cellular** system. ... **Channel Allocation** Strategies are designed in such a way that there is efficient use of frequencies, time slots and bandwidth.

34. _____ leads to time dispersion and frequency selective fading.
a) Doppler spread
b) Multipath delay spread
c) Time dispersive parameters
d) Frequency delay spread

Answer: b
Explanation: Multipath delay spread leads to time dispersion and frequency selective fading. Doppler spread leads to frequency dispersion and time selective fading. These two propagation mechanism are independent of each other.

35. Which of the following is not a characteristic of flat fading?
a) Mobile radio channel has constant gain
b) Linear phase response
c) Non-linear phase response
d) Bandwidth is greater than the bandwidth of transmitted signal

Answer: c
Explanation: The received signal will undergo flat fading if mobile radio channel has a constant gain and linear phase response over a bandwidth which is greater than the bandwidth of transmitted signal. It is the most common type of fading.

36. Spectral characteristics of the channel changes with time in flat fading.
a) True
b) False

Answer: b
Explanation: In flat fading, the multipath structure of the channel is such that spectral characteristics of the transmitted signal are preserved at the receiver. But, the strength of the received signal changes with time due to fluctuations in the gain of channel caused by multipath.

37. Flat fading channel is also known as _____
a) Amplitude varying channel
b) Wideband channel
c) Phase varying channel
d) Frequency varying channel

Answer: a
Explanation: Flat fading channel is also known as amplitude varying channel. They are also sometimes referred to as narrowband channel. In flat fading channel, the bandwidth of the applied signal is narrow as compared to the channel flat fading bandwidth.

38. The GSM technology uses a combination of … multiplexing techniques.
A. FDMA and TDMA
B. SDMA and TDMA
C. FDMA and CDMA

Answer: A

GSM uses TDMA and **FDMA** for user and cell separation

39. GSM system consists of the … administrative region assigned to one mobile switching centre.
A. minimum one
B. maximum one
C. minimum two
D. maximum two

Answer: A

GSM System Hierarchy consists at the minimum one administrative region assigned to one MSC (Mobile Switching Centre)

40. The … includes Mobile Equipment (ME) and the Subscriber Identity Module (SIM).
A. Base Station Subsystem (BSS)
B. Base Station Controller (BSC)
C. Mobile Station (MS)
D. Mobile Switching Centre (MSC)

Answer: C

Mobile Station in GSM consist of ME and SIM.

41) The advantages of FDMA over TDMA includes
1. Division is simpler
2. Propagation delays are eliminated
3. Cheaper filters with less complicated logic functions
4. Linearity

a. 1, 2 and 3 are correct
b. 1 and 2 are correct
c. 1 and 4 are correct
d. All four are correct
ANSWER: 1 and 2 are correct

42. Which of the following statement is defined as line of sight distance?
a) Distance covered by a direct space wave from transmitting to receiving antenna
b) Distance covered by an indirect space wave from transmitting to receiving antenna
c) Distance covered by a direct sky wave from transmitting to receiving antenna
d) Distance covered by an indirect sky wave from transmitting to receiving antenna

Answer: a
Explanation: LOS (Line of sight) is defined for space wave propagation. It is the distance covered by a direct space wave from transmitting to receiving antenna. It depends on the height of the transmitting and receiving antennas and effective earth's radius factor k.

43. On which of the following factors does the LOS distance depends?
a) Height of receiving antenna alone
b) Height of transmitting antenna alone
c) Only on height of transmitting and receiving antenna
d) On height of transmitting and receiving antenna and effective earths radius factor k

Answer:d
Explanation: LOS (Line of sight) is the distance covered by a direct space wave from transmitting to receiving antenna. The LS distance depends on the effective earth's radius factor k and height of the transmitting and receiving antennas. The LOS distance is given by d=4.12(ht−−√+hr−−√) in km.

44. Signals with a frequency propagation above 30MHz use __ transmission

A. ground

B. sky

C. line-of-sight

D. none of the above

Answer: C

45. The MSC with an interface to other network like Public Switched Telephone (PSTN) is called ____ .

A. Gateway main switching centre.

B. Main Switching Centre

C. Base Station Subsystem

D. Base Transceiver Station

Answer: A

The MSC with an interface to other network like Public Switched Telephone (PSTN) is called gateway main switching centre.

46. _____ has a function to authenticate each SIM card that attempts to connect to the GSM core network.

A. Authentication centre (AUC)

B. Equipment Identity Register

C. Subscriber Identity Module (SIM)

D. Base Station Controller (BSC)

Answer: A

AUC look after not in favour of robber or thief during air interface. It keeps the authentication keys and granted the security triplets. It is normally linked with the HLR.

47. BSS consists of following elements.

A. One BTS, Two BSC, Two TRAU (Transcoding Rate and Adaptation Unit)
B. One or more BTS, Two BSC, One TRAU (Transcoding Rate and Adaptation Unit)
C. One or more BTS, One BSC, One TRAU (Transcoding Rate and Adaptation Unit)
D. One BTS, One or more BSC, One TRAU (Transcoding Rate and Adaptation Unit)
Answer: C
Explanation: With air interface BSS provides MS and NSS (Network Station Subsystem). BSS consists of following elements.

- One or more BTS
- One BSC
- One TRAU (Transcoding Rate and Adaptation Unit)

48. Radio Uplink transmission path from?
A. HLR to VLR
B. Mobile Station (Cell Phone) to a Base Station (Cell Site)
C.BSC to BSS
D.SIM to ME
Answer: B
Explanation: The radio uplink is the transmission path from the Mobile Station (Cell Phone) to a Base Station (Cell Site).

49. Path loss in free space model is defined as difference of _____
a) Effective transmitted power and gain
b) Effective received power and distance between T-R
c) Gain and received power
d) Effective transmitter power and receiver power

Answer: d
Explanation: I Path loss is defined as difference of effective transmitter power and receiver power. Free-space path loss is the loss in signal strength of an electromagnetic wave that would result from a line-of-sight path through free space, with no obstacles nearby to cause reflection or diffraction.

50. Fading is caused due to

1. Multi path propagation
2. Obstacles
3. Frequency variations at the source
4. Variation in amplitude and phase at receiver

a. 1) and 2) are correct
b. 1), 2) and 4) are correct
c. 2) and 3) are correct
d. All are correct

ANSWER: b. 1), 2) and 4) are correct

Explanation: Fading can be either due to multipath, called as **multipath fading** or due to **shadowing** from obstacles affecting the wave propagation

UNIT 2 MOBILE COMMUNICATION MCQ

1. What is frequency reuse?
   a) Process of selecting and allocating channels
   b) Process of selection of mobile users
   c) Process of selecting frequency of mobile equipment
   d) Process of selection of number of cells

Answer: a

2. Which of the following is a universally adopted shape of cell?
   a) Square
   b) Circle
   c) Triangle
   d) Hexagon

Answer: d

3. Capacity of a cellular system is directly proportional to _____
   a) Number of cells
   b) Number of times a cluster is replicated
   c) Number of Base stations
   d) Number of users

Answer: b

4. In fixed channel assignment strategy, each cell is allocated a predetermined set of _____
   a) Voice channels
   b) Control channels
   c) Frequency
   d) base stations

Answer: a

5. What is a borrowing strategy in fixed channel assignments?
   a) Borrowing channels from neighbouring cell
   b) Borrowing channels from neighbouring cluster
   c) Borrowing channels from same cell
   d) Borrowing channels from other base station in same cell

Answer: a

6. In dynamic channel assignment strategy, base station requests channel from _____
   a) MSC
   b) Neighbouring cell
   c) Neighbouring cluster
   d) Neighbouring base station

Answer: a

7. What is the condition for handoff?
   a) A mobile moves into a different cell while in conversation
   b) A mobile remains in the same cell while in conversation
   c) A mobile moves to different cell when idle
   d) A mobile remains in the same cell and is idle

Answer: a

8. The time over which a call can be maintained within a cell without handoff is called _____
   a) Run time
   b) Peak time
   c) Dwell time
   d) Cell time

Answer: c

9. Which of the following is associated with the handoff in first generation analog cellular systems?
   a) Locator receiver
   b) MAHO
   c) Cell dragging
   d) Breathing cell

Answer: a

10. A handoff is initiated when the power received from the base station of a neighbouring cell falls behind the power received from the current base station by certain level.
   a) True
   b) False

Answer: b

11. What is the condition for intersystem interference?
   a) Mobile moves from one cell to another cell
   b) Mobile remains in the same cell
   c) Mobile moves from one cellular system to another cellular system
   d) Mobile remains in the same cluster

Answer: c

12. Umbrella cell approach is possible by using _____
   a) Antenna of same heights
   b) Antenna of different heights
   c) Different voice channels
   d) Different control channels

Answer: b

13. Soft handoff is also known as _____
   a) MAHO
   b) Hand over
   c) Break before make
   d) Make before break

Answer: d

14. The process of transferring a mobile station from one base station to another is

a. MSC
b. Roamer
c. Hand off
d. Forward channel

ANSWER: c

15. Hexagon shape is used for radio coverage for a cell because

a. It uses the maximum area for coverage
b. Fewer number of cells are required
c. It approximates circular radiation pattern
d. All of the above

Answer : d

16. In which one of the following codes with specific characteristics can be applied to the transmission?

a) VLR
b) HMR
c) CMR
d) SIM

Answer: d

17. Which of the following offers packet mode data transfer service over the cellular network?

a. TCP
b. GPRS
c. GSM
d. None of the above

Answer: b

18. Which one of the following enables us to use the entire bandwidth simultaneously?

a. TDMA
b. CDMA
c. FDMA
d. All of the above

Answer: b

19. In a Cellular network, which of the following is used to use the same frequency for others?

a. Frequency hopping
b. Frequency reuse
c. Frequency planning
d. None of the above

Answer: b

20. In general, a mobile computing environment can also be considered as the type of _____ environment.

a. Grid computing
b. Mobile computing
c. Distributed computing
d. None of the above

Answer: c

21. Which of the following is a fundamental principle of wireless communication?

a. Electromagnetic waves
b. Microwaves
c. Both A and B
d. None of the above

Answer: a

22. Which of the following is required to transmit the digital information using a certain frequency by translating it into an analog signal?

a. Demodulation
b. Modulation
c. QPSK
d. BSPK

Answer: b

23. How many types of security services are provided by the GSM?

a. 1

b. 2
c. 3
d. None of the above

Answer: c

24. In which one of the following, the early FM push to talk telephone system, was used?

a. Half Duplex
b. Full Duplex
c. Simple Duplex
d. None of the above

Answer: a

25. Which of the following statements about the Half Duplex is correct?

a. It is a type of communication in one direction
b. It is a type of communication in one direction at a time
c. It is a type of by directional communication at the same time
d. None of the above

Answer:b

26. Radio capacity may be increased in cellular by_____

a. Increase in the radio spectrum
b. Increasing the number of base stations & reusing the channels
c. None of the above
d. Both a & b

Answer: b

27. Commonly used mode for 3G networks is

a. TDMA
b. FDMA

c. TDD

d. FDD

ANSWER: d.

27. State whether True of False.
i) The cells or subdivisions of a geographical area are always hexagonal.
ii) A land to Mobile call originates through the Telephone exchange.

A) True, False
B) False, True
C) False, False
D) True, True

Answer : B

28. The basic GSM is based on _____ traffic channels.

A) connection oriented.
B) connection less.
C) packet switching.
D) circuit switching.

Answer : A

29. In ..... Frequency Spectrum is divided into smaller spectra and is allocated to each user.
A) TDMA
B) CDMA
C) FDMA
D) FGMA

Anwer : C

30. What are co-channel cells?

a) Cells having different base stations

b) Cells using different frequency

c) Cells using adjacent frequency

d) Cells using same frequency

Answer: d

31. Interference is more severe in rural areas.

a) True

b) False

Answer: a

32. Co-channel interference is a function of _____

a) Radius of cell

b) Transmitted power

c) Received power

d) Frequency of mobile user

Answer: a

33. What is breathing cell effect?

a) Fixed coverage region

b) Dynamic and time varying coverage region

c) Large coverage region

d) Very small coverage region

Answer: b

34. Which of the following problem occur due to adjacent channel interference?

a) Blocked calls

b) Cross talk

c) Near-far effect

d) Missed calls

Answer: c

35. Interference in frequency bands may lead to

a. Cross talk
b. Missed calls
c. Blocked calls
d. All of the above

ANSWER: d.

36. Co- channel reuse ratio depends upon

a. Radius of the cell
b. Distance between the centers of the co channel cells
c. Frequency allocation of nearest cells
d. Both a) and b)
e. Both b) and c)

ANSWER: d.

37. Which among the following represents the flawless hand-off with no perceivable interruption of service?

a. Hard hand-off
b. Soft hand-off
c. Intracell hand-off
d. Intercell hand-off

ANSWER: b

38. If the system is designed with the usage of hexagonal-shaped cells, how are the base-stations located?

a. At the centre of cell

b. At the edge of cell

c. At the corner of the cell

d. All of the above

ANSWER: d

39. Which method of cellular network assists in minimizing the co-channel interference associated with the angle of degree?

a. Cell Splitting

b. Cell Sectoring

c. Cell Segmentation & Dualization

d. None of the above

ANSWER: b

40. Which of the following does not come under the teleservices of GSM?

a) Standard mobile telephony

b) Mobile originated traffic

c) Base originated traffic

d) Packet switched traffic

Answer: d

41. Which of the following comes under supplementary ISDN services?

a) Emergency calling

b) Packet switched protocols

c) Call diversion

d) Standard mobile telephony

Answer: c

42. Which of the following feature makes impossible to eavesdrop on GSM radio transmission?

a) SIM

b) On the air privacy

c) SMS

d) Packet switched traffic

Answer: b

43. Which of the following does not come under subsystem of GSM architecture?

a) BSS

b) NSS

c) OSS

d) Channel

Answer: d

44. What is the abbreviation of CDMA?
A) Code Digital Multiple Access
B) Code Duplex Multiple Access
C) Code Division Multiple Access
D) None

Answer : C

45. The GSM technology uses a combination of … multiplexing techniques.

A. FDMA and TDMA

B. FDMA and TDMA

C. SDMA and TDMA

D. FDMA and CDMA

Answer : B

45. While handoffs, the termination of call may be avoided by

A Providing Guard channel
B Queuing of handoffs
C Both a & b
D None of the above

Answer: C

46. Umbrella cell approach

A Uses large and small cells
B Uses different antenna heights
C Is used for high speed users with large coverage area and low speed users with small coverage area
D All of the above

Answer: D

47. In time diversity

A Multiple versions of signals are transmitted at different time instants
B Signal is transmitted with different polarization
C The signal is transmitted using multiple channels
D All of the above

Answer: a

48. The main aim of the file system is to support_____

a. Transparent access to data
b. Efficient access to data
c. Consistent access to data
d. All of the above

Answer: d

49. One of the essential challenges of distributed systems apply to DFS is/are

a. Migration of data
b. Concurrent access to data
c. Replication of data
d. All of the above

Answer: d

50. Which of the following can be considered as the advantage of using frequency reuse?

a. The same spectrum can be allocated to the other networks
b. Only a limited spectrum is required
c. Increase capacity
d. All of the above

Answer: d

UNIT 3 MOBILE COMMUNICATION MCQ

Q1 : The field of the MAC frame that alerts the receiver and enables it synchronize is known as

a:SFD
b:preamble
c:source address
d:destination address

Ans: preamble

Q2 : Medium Access Control is the sub layer of

a:LLC
b:IEEE
c:ANSI
d:both a and c

Ans: IEEE

Q3 : The Medium Access Control layer frame has

a: 5 Fields
b: 7 Fields
c: 9 Fields
d: 11 Fields

Ans: 7 Fields

Q4 : The value of the frame body field of Medium Access Control frame is in between

a: 0 and 512 bytes
b: 0 and 1214 bytes
c: 0 and 2312 bytes
d: 0 and 3450 bytes

Ans: 0 to 2312 bytes

Q5: The duration field D of Medium Access Control layer frame contains

a: 2 bytes
b: 4 bytes
c: 6 bytes
d: 8 bytes

Ans: 2 bytes

Q6: Which multiple access technique is used by IEEE 802.11 standard for wireless LAN?

a: CDMA
b: CDMA/CD
c: CDMA/CA
d: None of the Above

Ans: CDMA/CA

Q7: What is the size of MAC address?

a:16-bits
b:32-bits
c:48-bits
d:64-bits

Ans : 48 Bits

Q8: This is what happens if two devices on the same Ethernet network determine the network is free, but attempt to transmit data at exactly the same time.

a: overlap
b: crossover
c: collision
d: None of the above

Ans: collision

Q9: This describes how the Ethernet protocol regulates communication among connection points.

a: Carrier Sense Multiple Access/Collision Detect

b: Discontinuous transmission
c: Aggregator
d: Wait and response

Ans: : Carrier Sense Multiple Access/Collision Detect

Q10: GSM is an example of

a: TDMA
b: FDMA
c: CDMA
d: SDMA

Ans: TDMA

Q11: Global Positioning System uses

a: CDMA
b: TDMA
c: SDMA
d: FDMA

Ans: CDMA

Q12: SDMA technique employs

a: Smart antenna technology
b: Use of spatial locations of mobile units within the cell
c: More Battery Consumption
d: Both a and b

Ans: Both a and b

Q13: The advantage of using SDMA over other spread spectrum technique

a: Mobile Station
b: Reduced spectral efficiency
c: Increased spectral efficiency
d: Both a and c

Ans: Both a and c

Q14: The increased capacity of SDMA is due to

a: Focused signal transmitted into narrow transmission beams
b: Smart antennas pointing towards mobile stations
c: Use of different frequencies at same time slot
d: Both a and b

Ans: Both a and b

Q15: In FDMA

1: Each user is assigned unique frequency slots
2: Demand assignment is possible
3: Fixed assignment is possible
4: It is vulnerable to timing problems

a: 1 and 2 are correct
b: 2 and 4 are correct
c: 1,2 and 3 are correct
d: All four are correct

Ans: 1,2 and 3 are correct

Q16: In TDMA , the user occupies the whole bandwidth during transmission

a: True
b: False

Ans: True

Q17: TDMA allows the user to have

a: Use of the same frequency channel for same time slot
b: Use of the same frequency channel for different time slot
c: Use of same time slot for different frequency channel
d: Use of different time slot for different frequency channels

Ans: b:Use of same frequency channel for different time slot

Q18: Direct Sequence Spread Spectrum demodulation uses

a: DPSK
b: FSK
c: ASK
d: QPSK

Ans: a: DPSK

Q19: OFDM is a technique of

1: Encoding digital data
2: Multiple carrier frequencies
3: Wide band digital communication
4: 4G mobile communication

a: 1,2 and 3 are correct
b: 2 and 3 are correct
c: 1,2 and 4 are correct
d: All four are correct

Ans: All four are correct

Q20: The troubles that OFDM faces over other spread spectrum techniques are

1: Sensitivity to Doppler shift
2: Frequency synchronization problems
3: Time synchronization problems
4: Low efficiency due to guard intervals

a: 1,2 and 3 are correct
b: 2 and 3 are correct
c: 1,2 and 4 are correct
d: All four are correct

Ans: 1,2 and 4 are correct

Q21: The guard interval is provided in OFDM

1: To eliminate the need of pulse shaping filter
2: To eliminate ISI
3: High symbol rate
4: Both a and b

Ans: Both a and b

Q22: Which of the following statements is correct about the FHSS?

a: FHSS is a type of narrowband signal
b: It uses the 78 frequency in the 2.4 GHz
c: It is referred as Frequency Hopping Spread Spectrum
d: All of the above

Ans: All of the above

Q23: DSSS system spreads the baseband signal by _____ the baseband pulses with a pseudo noise sequence.
a) Adding
b) Subtracting
c) Multiplying
d) Dividing

Answer: c: Multiplying

Q24: The bandwidth of the channel used in the hopset is called _____
a) Hopping bandwidth
b) Total hopping bandwidth
c) Instantaneous bandwidth
d) 3 dB bandwidth

Ans: c: Instantaneous bandwidth

Q25: In fast frequency hopping, hopping rate is less than the information symbol rate.
a) True

b) False

Ans: b: false

Q26: Minimum shift keying is similar to

a) Continuous phase frequency shift keying
b) Binary phase shift keying
c) Binary frequency shift keying
d) QPSK

Ans: a) Continuous phase frequency shift keying

Q27: The technique that may be used to reduce the side band power is

a) MSK
b) BPSK
c) Gaussian minimum shift keying
d) BFSK

Ans: c) Gaussian minimum shift keying

Q28: The technique that may be used to reduce the side band power is

a) MSK
b) BPSK
c) Gaussian minimum shift keying
d) BFSK

Ans: c) Gaussian minimum shift keying

Q29: The modulation techniques employed in for telephone modems is?

a: QAM

b: GMSK

c: QPSK

d: GFSK

Answer a) QAM

Q30: Quadrature Amplitude Modulation (QAM) is

a. Have same bandwidth used for two DSB-SC signals
b. Is also known as Bandwidth Conservation scheme
c. Is used in color television
d. All of the above

ANSWER: (d) All of the above

Q31: Which UE categories support 64QAM on the uplink?

a: Only category 5
b: Categories 3,4 and 5
c: None of them
d: All of them

Ans: A) Only category 5

Q32: What does the DC subcarrier indicate?

a: The identity of the cell
b: The antenna configuration
c: The center of the OFDM channel
d: The format of the data channel

Ans: C) The center of the OFDM channel

Q33: What processing step combines multiple OFDM subcarriers into a single signal for transmission?

a: FFT

b: IFFT
c: RF Combining
d: Channel Mapping

Ans: B) IFFT

Q34: In OFDM, what is the relationship between the subcarrier spacing f and the symbol time t?

a: There is no fixed relation

b: f = t

c: f * t = 2048
d: f = 1/t

Ans: d) f = 1/t

Q35: The constellation diagram of 16-QAM has _____ dots.

a: 4
b: 8
c: 16
d: None

Ans: c) 16

Q36: Which of the following is not an analog-to-analog conversion?

a: QAM
b: AM
c: PM
d: FM

Ans: a) QAM

Q37: If the baud rate for a 64-QAM signal is 2000, what is the bit rate?

a: 12000
b: 1000
c: 400
d: 300

Ans: a) 12000

Q38: 8PSK

a: 1 bit can be communicated in each modulation-symbol interval
b: 2 bits can be communicated in each modulation-symbol interval
c: 3 bits can be communicated in each modulation-symbol interval
d: 6 bits can be communicated in each modulation-symbol interval

Ans: C) 3 bits can be communicated in each modulation-symbol interval

Q39: 64QAM

a: 2 bits can be communicated in each modulation-symbol interval
b: 3 bits can be communicated in each modulation-symbol interval
c: 4 bits can be communicated in each modulation-symbol interval
d: 6 bits can be communicated in each modulation-symbol interval

Ans: d) 6 bits can be communicated in each modulation-symbol interval

Q40: Combining 16QAM or 64QAM with channel coding may produce less bit-error probability, compared to QPSK.

a: True

b: False

Ans: A) True

Q41: 16QAM or 64QAM uses more bandwidth and produces less bit-error probability compared to QPSK.

a: True
b: False

Ans: B) False

Q42: The modulation scheme that has the highest variations in instantaneous transmit power is

a: 64QAM
b: QPSK
c: 16QAM
d: 48QAM

Ans: A)64QAM

Q43: The reasons for using OFDM in 4G systems are

1: Better performance against time dispersion
2: Better performance against frequency selectivity
3: The design for an equalizer is easier for bandwidths larger than 5 MHz
4: It can perform well even at the edge of a cell

a: 1 and 2
b: 2,3 and 4
c: 1 and 3
d: All of the above

Ans: D) All of the above

Q44: The troubles that OFDM faces over other spread spectrum techniques are

1. Sensitivity to Doppler shift
2. Frequency synchronization problems
3. Time synchronization problems
4. Low efficiency due to guard intervals

a. 1,2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four correct

ANSWER: c. 1, 2 and 4 are correct

Q45: When we divide the band of orthogonal frequency division multiplexing (OFDM) into sub bands, it diminishes the effects of

a: Noise
b: Collision
c: Interference
d: Signal's absence

Ans: C) Interference

Q46: Advantages of using OFDM include

1. Avoids complex equalizers
2. Low symbol rate and guard interval
3. Avoids ISI
4. Multiple users at same frequency

a. 1,2 and 3 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. All the four correct

ANSWER: d. All the four correct

Q47: Which new modulation technique is used by EDGE

a: BPSK
b: 8 PSK
c: DQPSK
d: AFSK

Ans: B)8 PSK

Q48: What is the set of possible carrier frequencies in FH-SS?

a) Hopset
b) Hop
c) Chips
d) Symbols

Ans: A) Hopset

Q49: What is the set of possible carrier frequencies in FH-SS?

a) Hopset
b) Hop
c) Chips
d) Symbols

Ans: A) Hopset

Q50: Orthogonal Frequency Division Multiplexing (OFDM) is similar to

a) TDM
b) FSD
c) BPS
d) FDM

Ans: D) FDM

Q51: The inputs to an 8-QAM modulator is C=0 I=0 Q=1 with a reference of –sinwct. The output is

a) 0.765V, -45
b) 0.665V, -55
c) 0.565V, -45
d) 0.465V, -55

Ans: A) 0.765V, -45

Q52: What is the bandwidth efficiency of 128QAM systems?

a) 5
b) 6
c) 7
d) 4

Ans: c) 7