

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. Sectorized 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 Served 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
- b. Outgoing call
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ANSWER: d. Transit call

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Answer: c. Circuit Switching

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ANSWER: c. 57.6 sec

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ANSWER: b. By overload condition

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- a. Commutative
- b. Distributive
- c. Cumulative
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69) Which type of holding time distribution is assumed for the voice conversation on telephone?

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ANSWER: c. Greater than

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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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Answer Explanation

ANSWER: Call congestion

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- b. distance
- c. time
- d. volume

ANSWER: c. time

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- 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 inunction 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 of 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. Sectorized 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. Weak signal conditions
- b. High traffic conditions
- c. Unavailability 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: Vcoders

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) Sector 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) Sector 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) N^2
- 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 fixed 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 happens 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) $Q=D \cdot R$

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) $(3N)^{\frac{1}{2}}$

b) N

c) 3N

d) \sqrt{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 message 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