**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, Ak = 1.4E and the required grade of service of about 0.01, what would be its traffic capacity?

a. 4.98 E  
b. 6.72 E  
c. 8.3 E  
d. 10 E

ANSWER: (a) 4.98 E

16)   Which among the following controls the dynamic characteristics of Phase Locked Loop (PLL)?

a. Low Pass Filter  
b. High Pass Filter  
c. Band Pass Filter  
d. Band Stop Filter

ANSWER: (a) Low Pass Filter

17)   After the application of line frequency in Phase Locked Loop (PLL), at which stage do/ does the VCO frequency start to exhibit variation?

a. Free running  
b. Capture  
c. Phase Lock  
d. All of the above

ANSWER: (b) Capture

18)   What is an acceptable value of dividing point between the wander and jitter?

a. 10 Hz  
b. 20 Hz  
c. 50 Hz  
d. 200 Hz

ANSWER:(a) 10 Hz

19)   If the voltage controlled by VCO exhibits variation at faster and rapid rate, then the instability of clock is known as \_\_\_\_\_\_\_

a. Clock wander  
b. Clock jitter  
c. Clock frequency  
d. Clock period

ANSWER: (b) Clock jitter

20)   Which theorem in random jitter specifies the composite effect of various uncorrelated noise sources despite the distribution approaches to Gaussian distribution?

a. Initial Value Theorem  
b. Final Value Theorem  
c. Central Limit Theorem  
d. None of the above

ANSWER: (c) Central Limit Theorem

21)   Which type of data network supports the interconnection of computers within highly populated area?

a. LAN  
b. WAN  
c. MAN  
d. None of the above

ANSWER: (c) MAN

22)   Which among the following is/are supported by LAN?

a. PABX  
b. PSTN  
c. SBDN  
d. All of the above

ANSWER: (a) PABX

23)   If the voice channel is free in PSTN, then what would be the maximum data rate supported by 3.1 kHz bandwidth of voice channel?

a. 2000 bps  
b. 4000 bps  
c. 6000 bps  
d. 8000 bps

ANSWER: (c) 6000 bps

24)   In Phase Shift Keying, how many bit/s is/are allowed to be transmitted per shift?

a. 1  
b. 2  
c. 4  
d. 8

ANSWER: (b) 2

25)   Which among the following utilizes the transmission line upto 85 – 95 %?

a. Voice Traffic  
b. Data Traffic  
c. Both a and b  
d. None of the above

ANSWER: (a) Voice Traffic

26)   If the system is designed with the usage of hexagonal-shaped cells, how are the base-stations located?

a. At the centre of cell  
b. At the edge of cell  
c. At the corner of the cell  
d. All of the above

ANSWER: (d) All of the above

27)   Which antennas are used at the center of the cells for the system with hexagonal-shaped cells?

a. Omni-directional antennas  
b. Sectored directional antennas  
c. Both a and b  
d. None of the above

ANSWER: (a) Omni-directional antennas

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

a. Co-channel Interference  
b. Adjacent-channel Interference  
c. Both a and b  
d. None of the above

ANSWER: (b) Adjacent-channel Interference

29)   Which effect is widespread in adjacent-channel interference especially after the reception of a weak signal by a mobile user from the base-station?

a. Near-far effect  
b. Doppler’s effect  
c. Capture effect  
d. Kendall effect

ANSWER: (a) Near-far effect

30)   Which method of cellular network assists in minimizing the co-channel interference associated with the angle of degree?

a. Cell Splitting  
b. Cell Sectoring  
c. Cell Segmentation & Dualization  
d. None of the above

ANSWER: (b) Cell Sectoring

31)   Which type of connection takes place between an incoming trunk and an outgoing trunk?

a. Local call  
b. Outgoing call  
c. Incoming call  
d. Transit call

ANSWER: (d) Transit call

32)   In message switching system, an incoming message gets \_\_\_\_ especially if the required route is busy.

a. lost  
b. stored in a queue & retransmitted  
c. sampled  
d. recovered

ANSWER: (b) stored in a queue & retransmitted

33)   Which type of switching network involves the establishment of a dedicated path between two stations?

a. Message Switching  
b. Packet Switching  
c. Circuit Switching  
d. Manual Switching

ANSWER: (c) Circuit Switching

34)   In packet switching, what does the header of each short size of packet consist of?

a. Source address  
b. Destination address  
c. Intermediate nodes  
d. All of the above

ANSWER: (d) All of the above

35)   In manual switching, which kind of battery exchange has the provision of subscribers set along with magneto generator?

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

ANSWER: (a) Local battery exchange

36)   If a group of trunk is offered 1200 calls during the busy hour & 20 calls are lost along with the average call duration of about 7 min, then what would be the total duration of congestion period?

a. 21.6 sec  
b. 42.2 sec  
c. 57.6 sec  
d. 98.2 sec

ANSWER:  (c) 57.6 sec

37)   In analyzing the traffic performance, how is the number of trunk decided with the provision of the Grade of Service (GoS) especially for larger group?

a. By normal load condition  
b. By overload condition  
c. By underload condition  
d. None of the above

ANSWER: (b) By overload condition

38)   If the queuing systems are connected in tandem configuration, what would be the nature of delay?

a. Commutative  
b. Distributive  
c. Cumulative  
d. Deductive

ANSWER: (c) Cumulative

39)   Which type of holding time distribution is assumed for the voice conversation on telephone?

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

ANSWER: (b) Exponential

40)   Which model of loss system allows the usage of Poisson distribution model for traffic analysis especially by assuming infinite number of users?

a. Lost Calls Cleared (LCC)  
b. Lost Calls Returned (LCR)  
c. Lost Calls Held (LCH)  
d. None of the above

ANSWER: (a) Lost Calls Cleared (LCC)

41)   In two-stage network, which phenomenon/situation occurs due to impossible connectivity of given incoming trunk to selected outgoing trunk specifically because of link utilization for other connection between primary and secondary switches?

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

ANSWER: (c) Blocking

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

a. Crossbar  
b. Director Exchange  
c. Strowger  
d. Tandem

ANSWER: (d) Tandem

43)   By how many times does the time division exchange exhibit connection and disconnection with respect to every millisecond, due to its ability of using rearrangeable networks?

a. 2  
b. 4  
c. 8  
d. 16

ANSWER: (c) 8

44)   Which signals are regarded as call-progress signals as they are sent back to inform the caller about the progress of the call?

a. Address Signals  
b. Status Signals  
c. Call request Signals  
d. Answer Signals

ANSWER: (b) Status Signals

45)   Which among the following exhibit/s the necessity of trunks during the signaling mechanism?

a. Inchannel Signaling  
b. Common Channel Signaling  
c. Both a and b  
d. None of the above

ANSWER: (a) Inchannel Signaling

46)   Phase jitter is generated by an additive noise on a \_\_\_\_\_\_\_\_\_\_sinusoidal wave.

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

ANSWER: (a) continuous

47)   What is /are the purpose/s of pulse stuffing in an asynchronous multiplexing?

a. Removal of slips & the need for clock synchronization  
b. Usability of output channel with higher rate than input  
c. Creation of timing adjustments  
d. All of the above

ANSWER: (d) All of the above

48)   In digital network synchronization, which approach indicates the cost burden carrying of highly accurate and redundant timing sources by means of smaller switching nodes?

a. Packetization  
b. Master Slave Clocking  
c. Network Wide Pulse Stuffing  
d. Plesiochronous Network

ANSWER:  (d) Plesiochronous Network

49)   If the desired connection has a low completion probability, which type of flow control technique is used for eliminating the capture of common resources?

a. Trunk Directionalization  
b. Cancellation of Alternate Routing  
c. Code Blocking  
d. Centralized Connection Control

ANSWER: (d) Centralized Connection Control

50)   In network management, managing the rate at which the traffic enters a network is known as \_\_\_\_\_

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

ANSWER: (a) Flow control

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

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

ANSWER: (d) All of the above

52)   The transfer of user messages from node to another by means of store and forward switching network is known as \_\_\_\_\_\_\_

a. jitter  
b. scaling  
c. hop  
d. entity

ANSWER: (c)  hop

53)   Consider the statements given below. Which among them represents the operational step executed in datagram Packet Switched Network?

a. Fixed Path is assigned between nodes from source to destination  
b. First Come First Serviced basis is applicable  
c. Necessity of an identifier for a connection between source host & destination host  
d. Transmission of short messages of one or two packet length

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

54)   In Protocol Data Units (PDUs), where do/does the data get/s interchanged?

a. Between peer entities  
b. Between entities of neighboring layers  
c. Between ‘N’ & ‘N+1’ layers  
d. All of the above

ANSWER: (a) Between peer entities

55)   Which type of framing technique/s reduce/s the problem of synchronization of the receiver?

a. Character Count  
b. Character Stuffing  
c. Bit Stuffing  
d. All of the above

ANSWER: (b) Character Stuffing

56)   If more number of cells are necessary in the frequency reuse distance, then the segmentation & dualization techniques get \_\_\_\_\_\_\_\_

a. united  
b. divided  
c. restricted  
d. filtered

ANSWER: (a) united

57)   Which hand-off stage deals with the relinquishment of unnecessary frequency channels by keeping the availability for other mobile users?

a. Initialization  
b. Resource Reservation  
c. Call Execution  
d. Call Completion

ANSWER: (d) Call Completion

58)   Which among the following represents the flawless hand-off with no perceivable interruption of service?

a. Hard hand-off  
b. Soft hand-off  
c. Intracell hand-off  
d. Intercell hand-off

ANSWER:  (b) Soft hand-off

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

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

ANSWER: (a) Electronic Switching Center (ESC)

60)   In Electronic Switching Centre (ESC), the transmission rate of X.25 protocol is \_\_\_\_9.6 Kbps.

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

ANSWER: (c) Greater than

61) Which type of connection takes place between an incoming trunk and an outgoing trunk?

a. Local call

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ANSWER: d. Transit call

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ANSWER: b. stored in a queue & retransmitted

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c. Circuit Switching

d. Manual Switching

Answer: c. Circuit Switching

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ANSWER: d. All of the above

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ANSWER: a. Local battery exchange

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a. 21.6 sec

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c. 57.6 sec

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ANSWER: c. 57.6 sec

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ANSWER: c. Cumulative

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ANSWER: c. Blocking

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73) 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?

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

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b. divided

c. restricted

d. filtered

ANSWER: a. united

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b. Equal to

c. Greater than

d. None of the above

ANSWER: c. Greater than