

TELECOMMUNICATION SYSTEMS
(ECEN 3131)

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group - A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) 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.
- (ii) If 'n' number of users is 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) $n(n - 1)/8$.
- (iii) 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.
- (iv) In Step by Step switching Line finders are connected to the
(a) Calling Subscriber (b) Called Subscriber
(c) Switching network (d) Between Exchange.
- (v) 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.

- (vi) In a three-stage space division switch, if $N = 200$, the number of cross points
(a) greater than 40,000 (b) less than 40,000
(c) 40000 (d) greater than 100,000.
- (vii) To send a data packet using datagram, connection will be established
(a) before data transmission
(b) connection is not established before data transmission
(c) no connection is required
(d) None of the above.
- (viii) The part of the telephone network between the telephone instrument at subscriber premises and the central office equipment is called the
(a) Inter Office Trunk (b) Tie line
(c) Subscriber Loop (d) Service Drop wire.
- (ix) Which of the following mode is suitable for propagation of a signal having frequency between 2 MHz and 30 MHz ?
(a) Ground Wave (b) Sky Wave
(c) LOS (d) None of the above.
- (x) In Telephony, Tone dialling takes _____ time than pulse dialling
(a) less
(b) more
(c) about the same
(d) Can't be determined

Group - B

2. (a) What is the basic principle of crossbar switches? Explain with necessary diagram.
(b) An exchange uses 50V battery; a resistance of 500Ω is placed in series with the battery. If the telephone set resistance is 50Ω , calculate the loop resistance limit for the minimum current requirement of 23 mA for a carbon microphone.
(c) Explain with necessary diagram the time division space switching. **(2+4)+3+3=12**
3. (a) What are the advantages of Stored Program Control(SPC)Switching System?
(b) Mention the basic difference between Distributed SPC system and Centralized SPC system with block diagram.
(c) What are the differences between space division switching and time division switching?
(d) Draw the schematic diagram of a TST switch.

2 + 4 + 4 + 2 = 12

Group - C

4. (a) Why hybrid circuit is needed in Subscriber loop systems?
(b) How routing decision is taken in the hierarchical system of routing? Explain with diagram.
(c) Draw the schematic diagram of Echo Suppressor and Echo Canceller.

2 + 6 + 4 = 12

5. (a) Write the differences between common channel and In-channel signalling.
(b) Describe the operation of a two motion selector switch with proper sketch.

6 + 6 = 12

Group - D

6. (a) Explain the reference points of a ISDN structure with proper diagram. What do you mean by 2B+D in ISDN architecture?

- (b) What is meant by B-ISDN?

(6+4) + 2=12

7. (a) Why distance is a limitation for DSL and not a limitation for voice telephone calls?

- (b) Explain different ways to place a call in VoIP service with block diagram.

- (c) What are the functional differences between Data Terminal Equipment (DTE) and Data Communications (or channel) Equipment (DCE)?

3 + 6 + 3 = 12

Group - E

8. (a) Define Busy Hour, Peak Busy Hour and Time Consistent Busy Hour.

- (b) A group of 20 servers carry traffic of 10 erlangs. If the average duration of a call is three minutes, calculate the number of calls put through by a single server and the group as a whole in a one-hour period.

- (c) Define Loss system and Delay system for Voice network and Data Network.

3 + 3 + 6 = 12

9. (a) What is the purpose of traffic engineering in telecommunication? State about different models of Loss system. What is GOS in traffic engineering?
- (b) If a group of 20 trunk carries 10 erlangs and the average call duration is 3 minutes, calculate the number of calls put through by a single server and the group as a whole in an one-hour period.
- (2+ 3 + 3) + 4=12**

Department & Section	Submission Link
ECE	https://classroom.google.com/c/MTE3ODE1ODgxNTQz/a/Mjc0MTgwNDkwMjcw/details