

**TELECOMMUNICATION SYSTEMS
(ECEN 3234)**

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) The unit of traffic intensity is
 (a) ampere (b) ohm
 (c) erlang (d) meter.
- (ii) SPC stands for
 (a) Stored Program Control (b) Storage Program Content
 (c) Stored Program Counter (d) Storage Program Control.
- (iii) The supply voltage used in telephone exchange is
 (a) 24 V (b) 48V (c) 12V (d) 0.48 mV.
- (iv) Blocking Probability is
 (a) time congestion (b) call congestion
 (c) both (a) and (b) (d) none of these.
- (v) What do you mean by death in a B-D process?
 (a) Call termination (b) Call blocked
 (c) Call intimation (d) None of these.
- (vi) The energising current required in the microphone of a telephone receiver is
 (a) 45-55 mA (b) 23 -25 mA
 (c) 45-55 μA (d) 23-25 μA.
- (vii) Subscriber loop is a pair of wires connecting
 (a) subscriber to exchange (b) talk battery
 (c) remote subscriber (d) exchanges in tandem.
- (viii) When the control subsystem is an integral part of the switching network, then it's called
 (a) direct control (b) stored program control
 (c) common control (d) distributed control.

- (ix) If PCM binary samples are switched, its known as
 (a) time division switching
 (b) analog time division switching
 (c) digital time division switching
 (d) none of these.
- (x) North American standard for PCM data transmission provides
 (a) 38 channels (b) 42 Channels
 (c) 24 channels (d) 32 channels.

Group - B

2. (a) What is the basic principle of crossbar switches? Explain the operation with necessary diagram?
 (b) Explain the working principle of Packet Switching, with necessary diagram. **(2 + 4) + 6 = 12**
3. (a) Draw and describe the impulsing circuit of a rotary dial telephone.
 (b) What is the difference between a pulse dialling & DTMF phone? Explain in details. **6 + 6 = 12**

Group - C

4. (a) Discuss about the European standard of PCM carrier channels? Write the advantages of Fiber-Optic cables compare to co-axial cable.
 (b) Draw the schematic diagram of hybrid circuit for 2 - wire to 4 - wire conversion circuit and discuss. **(5 + 3) + 4 = 12**
5. (a) Compare merits and demerits of fibre optics cable and copper/coaxial cable.
 (b) Describe, with a diagram, the operation of a 2M selector switch. **6 + 6 = 12**

Group - D

6. (a) Calculate the no of trunks that can be supported in a time multiplexed space switch, given that (i) 32 channels are multiplexed in each stream (ii) control memory access time and Bus switch and transfer times are 100ns each.
 Expand the Term "BORSCHT".

- (b) What is OSI model in telecommunication? Write down the different layer of OSI.

(4 + 2) + (2 + 4) = 12

7. (a) What are the drawbacks of ISDN? How does BISDN overcome these?
(b) Analyze the operation of a cordless phone with a diagram. What is ISM band?

(3 + 3) + (4 + 2) = 12

Group - E

8. Write short notes on any three:
(i) In-channel and common channel
(ii) IP Telephony
(iii) Signalling system 7 (SS7)
(iv) Digital PABX
(v) Electronic mail.

(4 + 4 + 4) = 12

9. (a) Define voice over IP. What is session initiation protocol and SIP message?
(b) What is EWSD? What is Automatic program system software? Discuss.

(2 + 2 + 2) + (3 + 3) = 12