

CS/B.TECH/ECE/EVEN/SEM-6/EC-603/2018-19



**MAULANA ABUL KALAM AZAD UNIVERSITY OF
TECHNOLOGY, WEST BENGAL**

Paper Code : EC-603

TELECOMMUNICATION SYSTEM

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

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

GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any ten of the following : 10 × 1 = 10
- i) cable consists of an inner copper core and a second conducting outer sheath.
- a) Twisted-pair b) Shielded twisted-pair
☒ c) Coaxial d) Fiber-optic.
- ii) The local loop has cable that connects the subscriber telephone to the nearest end office.
- a) fiber-optic b) coaxial
c) twisted-pair d) none of these.
- iii) Attenuation can be reduced in subscriber loop by using
- ☒ a) higher diameter in copper wire
b) series of inductance in line
c) lower diameter in copper wire
d) series of capacitance in line.

CS/B.TECH/ECE/EVEN/SEM-6/EC-603/2018-19

- iv) Crossbar switching system is
- ☒ a) Electromechanical
 - b) Electronic
 - c) Analog
 - d) Digital switching system.
- v) ESS stands for
- ☒ a) Electronic Switching System
 - b) Effective Electronic Switching System
 - c) Early Electronic Switching System
 - d) none of these.
- vi) MTTR means
- ☒ a) Mean Time To Repair
 - b) Maximum Time To Repair
 - c) Most Time To Repair
 - d) Mean Time To Represent.
- vii) One Erlang is equal to
- ☒ a) 36 CCS
 - b) 3600 CCS
 - c) 60 CCS
 - d) none of these.
- viii) If PCM samples are switched, switching is known as
- a) analog time division switching
 - ☒ b) digital time division switching
 - c) time division switching
 - d) none of these.
- ix) In signaling, a portion of the bandwidth is used for signaling and another portion for data.
- a) Mixed
 - b) in-band
 - c) out-of-band
 - ☒ d) none of these.
- x) High bandwidth for short duration is needed for
- ☒ a) Data traffic
 - b) Voice traffic
 - c) both (a) and (b)
 - d) none of these.
- xi) ISDN B-Channel carries data and services at
- a) 16 kbps
 - b) 32 kbps
 - ☒ c) 64 kbps
 - d) 1.544 kbps.
- xii) What does VoIP mean ?
- a) Venison on island pentulia
 - b) Voice over iguana protocol
 - ☒ c) Voice over internet protocol
 - d) Voice over internet primary.

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. a) State the advantages and disadvantages of fiber optic cable.
b) Explain the operation of 2-wire to 4-wire hybrid system. $2 + 3$
3. What is the significance of side tone in telephone conversation ?
4. Explain subscriber local loop architecture.
5. Explain associated and non-associated common channel signaling.
6. Explain the differences between circuit switching and packet switching.

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Define Simplex communication and Half-Duplex and Full-Duplex communication.
b) Define Trunk lines and subscriber lines.
c) What is point to point communication ? Mention the disadvantages of the point to point communication. <http://www.makaut.com>
d) If the number of nodes in point-to-point communication is 770, find out the total number of links required for full connectivity:
 $3 + 3 + (3 + 3) + 3$
8. a) Explain the touch tone dial arrangement with proper diagram.
b) What are the advantages of automatic exchanges over manual exchanges ?
c) Classify the switching systems Compare the electromechanical and electronic switching systems.
d) Describe how an uniselector rotary switch can be used as selector hunter. $3 + 3 + (2 + 2) + 5$

9. a) Define GOS and Blocking Probability.
b) Show that $GOS = P_B$, where P_B is the blocking probability.
c) During a busy hour, 1400 calls were offered to a group of trunks and 14 calls were lost. The average call duration has 3 minutes. Find (i) Traffic offered, (ii) Traffic carried, (iii) GOS and (iv) The total duration of period of congestion.
d) Calculate the unavailability of signal and dual processor systems in stored program control system. In SPC systems MTBF = 4000 Hr. and MTTR = 4 Hr. Calculate the unavailability for single and dual processor systems for 30 years.
- $3 + 3 + 4 + (3 + 2)$
10. a) How centralized SPC differs from distributed SPC ?
b) Assume that during an observation period of 3 hours, a server belonging to a group of 12 in a telecommunication network is occupied for an average of 45 minutes. What is the traffic carried by whole group ?
c) What is SS7 signaling system ? Explain its protocol.
d) Explain level-1 and level-2 functions of a SS7 signaling systems.
- $3 + 3 + 4 + 5$
11. Write short notes on any *three* of the following : 3×5
- a) Digital PABX
 - b) B-ISDN
 - c) TSI
 - d) ADSL modem
 - e) VoIP.
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