

**HERITAGE INSTITUTE OF TECHNOLOGY**M.Tech. 1st Semester Examination. 2014 Session : 2014-16**Discipline : ECE(Communication)**

Paper Code : ECEN 5132 Paper Name Telecommunication Systems & Engineering

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 x 1=10
- (i) GoS is defined as:
- (a) Ordered traffic to lost traffic (b) Ordered traffic to BH traffic
(c) Lost Traffic to ordered traffic (d) Carried traffic to lost traffic.
- (ii) In a time multiplexed space switching system, one speech sample appears every :
- (a) 125 micro sec. (b) 20 msec
(c) 125 msec (d) 1 sec.
- (iii) CCI Values in a crossbar exchange
- (b) can be modified (b) is fixed
(c) cross point dependent (d) has no significance.
- (iv) Link Budget is calculated based on
- (a) antenna gain & loss factors (b) cost of link setup
(c) base station tower height (d) redundancy levels.
- (v) ADSL Bins are continuously tested for
- (a) their Bandwidth (b) error in parity bit
(c) response (d) S/N.
- (vi) In Hot Standby Diversity Mode, on a one for one basis, both transmitters operate at
- (a) different carrier frequency (b) the same frequency
(c) either same or different frequency (d) depends on type of Diversity.
- (vii) European Standard E1 accommodates
- (a) 32 channels (b) 32+1 Channels
(c) 32+2 channels (d) 32+3 channels
- (viii) SONET are standards for
- (a) GSM Network (b) Fibre optics Network
(c) Packet Switching Network (d) Local Area Network.

**HERITAGE INSTITUTE OF TECHNOLOGY**M.Tech. 1st Semester Examination. 2014 Session : 2014-16**Discipline : ECE(Communication)**

Paper Code : ECEN 5132 Paper Name Telecommunication Systems & Engineering

- (ix) IEEE 802.11 sets standards for
- | | |
|----------|------------------|
| (a) WLAN | (b) LAN Security |
| (c) PAN | (d) Bluetooth. |
- (x) In B-ISDN, the maximum data rate can be
- | | |
|--------------|---------------|
| (a) 155Mbps | (b) 333 Mbps |
| (c) 600 Mbps | (d) 165 Mbps. |

Group - B

- 2.(a) State and explain discrete time discrete state Markov process. Hence define Birth-Death Process.
- (b) Using the concept of "Birth Death" process, derive a formula for Blocking Probability in a Telecom Network. 4 + 8 = 12
- 3.(a) A PABX which is designed to be non-blocking internally serves 100 extensions and has four trunk lines. Busy hour calling rate is two. Thirty per cent of the total traffic is external. Average call holding time is 3 minutes. What is the probability that an incoming call finds all the four trunk lines busy?
- (b) With suitable diagrams, explain the concept of E&M Signalling.
- (c) What do you understand by "Signalling" in Telecom system 5+5+2 = 12

Group - C

- 4.(a) Describe with a frame format, the principle and advantages of SONET. What are the tributaries that can be accommodated?
- (b) Describe with a sketch the principle of time slot interchange technique.
- (c) Describe how frame synchronization is achieved in PCM frame format according to the ANSI standard. How signalling is sent through this frame? 5+5+2 = 12
- 5.(a) What are the design essentials for a LOS microwave system? Explain Friis Formula to determine received power using standard nomenclature.
- (b) What are the basic concepts of ADSL? How is S/N improved in such systems? (3+4)+(2+3) = 12



HERITAGE INSTITUTE OF TECHNOLOGY

M.Tech. 1st Semester Examination. 2014 Session : 2014-16

Discipline : ECE(Communication)

Paper Code : ECEN 5132 Paper Name Telecommunication Systems & Engineering

Group - D

- 6.(a) What do you mean by connection oriented and connectionless networks? Why packet switching is preferred over message switching?
- (b) What do you mean by BUS topology? What is Carrier Sense Multiple Access (CSMA) technique?
- (c) What do you mean by CSMA-CD? What is called p-persistent CSMA proposal? 2+6+4 = 12
- 7.(a) What is the operation of LAN bridges? Explain the differences between translation type and encapsulation type bridges with diagrams.
- (b) What are the components of infrastructure type WLAN? Give brief description of each. Based on 802.11 standards, what are the advantages of DSSS over FHSS WLAN system? (1+6)+(2+3)
= 12

Group - E

- 8.(a) Explain the user network architecture of ISDN with suitable diagrams. (6) + (3+3)
= 12
- (b) What are the advantages of B ISDN? How it is implemented?
- 9.(a) Explain the concept of a VSAT Network. What are its specific advantages?
- (b) Write short notes on any two:
- i) one way & both way circuits
 - ii) Telephone hand set
 - iii) ATM
- (4+2)+(2x3)
= 12



CONFIDENTIAL

HERITAGE INSTITUTE OF TECHNOLOGY

M.Tech. 1st Semester Examination. 2014 Session : 2014-16

Discipline : ECE(Communication)

Paper Code : ECEN 5132 Paper Name Telecommunication Systems & Engineering