TELECOMMUNICATION SYSTEMS AND ENGINEERING
(ECEN 5231)

Time Allotted : 2½ hrs   **Full Marks : 60**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and
<u>any 4 (four)</u> from Group B to E, taking <u>one</u> from each group.

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

Group – A

1. Answer any twelve: **12 × 1 = 12**

Choose the correct alternative for the following

(i) The maximum length of subscriber loop is governed by
(a) Maximum loop resistance   (b) Attenuation on the loop
(c) both (a) & (b)   (d) GOS of the network.

(ii) The birth death process moves from K state to K-1 state if
(a) A birth occurs   (b) A death occurs
(c) No birth or death occurs   (d) Both birth and death occurs.

(iii) To develop a PCM system processes that are required are
(a) coding and sampling   (b) sampling and quantization
(c) sampling, quantization and coding   (d) quantization and coding.

(iv) The overflow of buffer at transmission interfaces is known as
(a) Slip   (b) Jitter
(c) Framing   (d) Clicks

(v) LAN protocol utilize only
(a) Network layer & Physical layer   (b) Data link layer & Physical layer
(c) Network layer & Data link layer   (d) Transport Layer & Data link layer

(vi) CSMA is a LAN technique which is also known as
(a) listen while transmitting   (b) listen before transmit
(c) listen after transmit   (d) receive before transmit.

(vii) Token passing is a
(a) randon performance of LAN   (b) non-predictable performance of LAN
(c) predictable performance of LAN   (d) none of these.

(viii) ISDN supports variety of services like
(a) Videotex and electronic mail   (b) Digital Facsimile
(c) Image and Graphics exchange   (d) All of these.

(ix) The basic rate access in ISDN is defined as
(a) 2B +D   (b) 2B +2D
(c) B + 2D   (d) 2B - D

(x) The protocol architecture of ISDN is layered according to the
(a) OSI layered model   (b) TCP/IP layered model
(c) ATM Model   (d) LCC model.

Fill in the blanks with the correct word

(xi) A time division digital switch may be designed by using a combination of space and _____ switching techniques.

(xii) To develop a PCM signal from an analog signal ____ processing steps are required.

(xiii) To avoid co-channel interference different cells must be set to different _____.

(xiv) _____ is the underlying packet technology of BISDN.

(xv) The ATM cell consists of _____ octets.

Group - B

2. (a) Distinguish between Folded and nonfolded network with proper diagram.
[(CO1)(Analyse/IOCQ)]
(b) Compare the concepts of three different methods of lost call handling.
[(CO1)(Analyse/IOCQ)]
(c) A group of 20 servers carry a traffic of 10 erlangs. If the average duration of a call is three minutes calculate the number of calls put through a single server and the group as a whole in an one hour period.   *[(CO1)(Evaluate/HOCQ)]*
4 + 4 + 4 = 12

3. (a) Distinguish between GOS and blocking probability with proper descriptions.
[(CO1)(Analyse/IOCQ)]
(b) Compare space division switching with time division switching.   *[(CO1)(Analyse/IOCQ)]*
(c) In a group of 10 servers, each is occupied for 30 minutes in an observation interval of two hours. Calculate the traffic carried by the group.   *[(CO1)(Evaluate/HOCQ)]*
5 + 4 + 3 = 12

Group - C

4. (a) Analyze the effect of distortion, echo & crosstalk on PCM transmission system.
[(CO2)(Analyze/IOCQ)]
(b) Summarize the characteristics of SONET.   *[(CO2)(Remember/LOCQ)]*
6 + 6 = 12

5. (a) To Design a PCM system the various transmission impairments are to be considered. Critically elucidate your views.   *[(CO2)(Create/HOCQ)]*
(b) Analyze the basic advantages and disadvantages of PCM transmission.
[(CO2)(Analyze/IOCQ)]
(c) Explain superframe in enhanced PCM system.   *[(CO2)(Remember/LOCQ)]*
6 + 3 + 3 = 12

Group - D

6. (a) Compare the two generic transmission techniques utilized by LANs.
   [(CO3)(Analyse/IOCQ)]

   (b) Mention the two principal frequencies used for WLAN? Based on IEEE 802.11 standard explain the principal advantage of a DSSS over a FHSS WLAN system.
   [(CO3,CO4)(Understand/LOCQ)]

   6 + (1 + 5) = 12

7. (a) CSMA/ CD is sometimes called listen while transmitting — Justify.
   [(CO3)(Analyse/LOCQ)]

   (b) Explain the process of loop polling of LAN access protocols.   *[(CO3)(Remember/LOCQ)]*

   (c) Discuss briefly various techniques to avoid co-channel interference in WLAN.
   [(CO4)(Remember/LOCQ)]

   4 + 4 + 4 = 12

Group - E

8. (a) Mention the underlying technology for B-ISDN? Discuss the major features of that technology.   *[(CO6)(Analyse/IOCQ)]*

   (b) Mentions the different functions of the lower three layer of ISDN.
   [(CO5)(Understand/LOCQ)]

   (2 + 4) + 6 = 12

9. (a) Differentiate between the functions of three lower layers of ISDN.
   [(CO5)(Analyse/HOCQ)]

   (b) Explain the functions of B and D channels of ISDN.   *[(CO5)(Understand/IOCQ)]*

   6 + 6 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	34.38	45.83	19.79