ENGINEERING & MANAGEMENT EXAMINATIONS, DECEMBER – 2008
TELECOMMUNICATION SYSTEMS
SEMESTER – 5

Time : 3 Hours]   [Full Marks : 70

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :   10 x 1 = 10

   i)   ISDN B-Channel carries data and services at

      a)   16 Kbps   b)   32 Kbps

      c)   64 Kbps   d)   1·544 Mbps.

   ii)   In DTMF tone, the frequency used is

      a)   697 Hz/1209 Hz   b)   920 Hz/1478 Hz

      c)   220 Hz/540 Hz   d)   50 Hz/120 Hz.

   iii)   A telephone set requires a bias current of

      a)   1 – 2 mA   b)   4 – 6 mA

      c)   22 – 30 mA   d)   50 – 100 mA.

   iv)   In a Strowger system, a high value of CCI indicates

      a)   good design   b)   poor design

      c)   no impact no design   d)   EUF data need to be checked.

   v)   The standard value of GOS in India is

      a)   0·2   b)   0·002

      c)   0·02   d)   0·0002.

vi)   The ratio of the number of successful calls to the total no. of calls attempt is called

a)   busy hour call attempt   b)   call completion rate

c)   busy hour calling rate   d)   traffic load.

vii)   Which of the following is correct ?

a)   IE = 60 CCS   b)   IE = 36 CCS

c)   IE = 3600 CCS   d)   None of these.

viii)   Loudspeaker is an end instrument of

a)   transmitter side   b)   receiver side

c)   both (a) & (b)   d)   none of these.

ix)   A fully connected network has five nodes so physical link required

a)   20   b)   10

c)   5   d)   15.

x)   Compared to single processor based, dual processor based SPC exchange offers

a)   Higher unavailability

b)   Higher availability

c)   Higher reliability

d)   Higher reliability & availability.

xi)   In a diagonal cross-point matrix switching system, if the number of cross-point switches 136, then the number of subscriber is

a)   27   b)   14

c)   17   d)   30.

xii)   Network termination interface between a customer premises and ISDN network is called

a)   NT1   b)   NT2

c)   TE1   d)   TE2.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following.   3 × 5 = 15

2. a) What do you mean by point-to-point communication ? Mention the disadvantage of the scheme.

    b) Write down the differences between in channel and common channel signalling.

                                              2 + 1 + 2

3. Define the following terms :

    a) Cost capacity index

    b) Equipment utilization factor

    c) Traffic handling capacity. $2 + 1\frac{1}{2} + 1\frac{1}{2}$

4. a) What are the salient features of RS 232 C standard used in computer communication ?   3

    b) Why are MODEMs used in communication ?   2

5. What is BORSCHT function ? Why is this important in electronic exchanges ?   2 + 3

6. How many types of transmission media are used in telecommunication ? What are the advantages of twisted pair cable over parallel wire cable ? What is step index fibre and graded index fibre ?   2 + 1 + 2

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following questions.   3 × 15 = 45

7. What is the difference between time switch and space switch. Describe time division time switching and calculate the switching capacity of the systems.   3 + 12

8. a) Describe the centralised SPC organization system.

    b) Draw the architecture of 5ESS system.

c)   Consider a subscriber loop of 12 km long, the loop resistance 1607 ohm. Calculate *d.c.* loop resistance and determine the cable gauge for the loop ?

d)   Describe how an uniselector rotary switch can be used as selector hunter ?

6 + 2 + 3 + 4

9.   a)   Calculate the unavailability of single and dual processor systems in stored program control systems.

b)   In SPC systems MTBF = 4000 Hr and MTTR = 4 Hr. Calculate the unavailability for single and dual processor systems for 30 years.

c)   Why active processor upgrades the secondary memory after certain time period in standby mode of SPC system.   8 + 3 + 4

10. a)   A circuit switching communication network involves 5 switching nodes. Each node takes 2 seconds and 0·2 seconds for establishing and releasing connection respectively. If the data transfer rate is 2400 bps, compute the data transfer time for a message that is 300 bytes long. Derive the formula used.   5

b)   Explain the Hybrid circuit for Digital exchanges.   5

c)   Explain what do you understand by the term 'Redundancy' as applied to Electronic exchanges. Explain the concept with 'Synchronous Duplex Operation'. 5

11. Write short notes on any *two* of the following : $7\frac{1}{2}+7\frac{1}{2}$

a)   Data Terminal Equipment (DTE)

b)   Three-stage combination switch

c)   Switching hierarchy and routing

d)   Common control switching system.

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END