Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/B.TECH(ECE)/SEM-5/EC-501/2011-12

2011

TELECOMMUNICATION SYSTEMS

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)

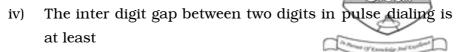1. Choose the correct alternatives for any *ten* of the following :

$$10 \times 1 = 10$$

i) For a fully connected network of 10 subscribers the number of links required are

　a) 10　　　　　　　　b) 5

　c) 45　　　　　　　　d) 55.

ii) In DTMF tone the frequency used is

　a) 697/1209 Hz　　　b) 900/1400 Hz

　c) 10/100 Hz　　　　d) 220/1477 Hz.

iii) GOS in India is

　a) 0.002　　　　　　b) 0.02

　c) 0.2　　　　　　　d) 2.

iv) The inter digit gap between two digits in pulse dialing is at least
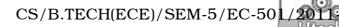
    a) 200 ms   b) 200 ns

    c) 200 μs   d) none of these.

v) One Erlang is equal to

    a) 36 CCS   b) 3600 CCS

    c) 60 CCS   d) none of these.

vi) What do you mean by death in a B-D process ?

    a) Call termination   b) Call blocked

    c) Call initiation   d) None of these.

vii) Crossbar switching system is

    a) Electromechanical

    b) Electronic

    c) Analog

    d) Digital switching system.

viii) In NT 1 interface occurs between

    a) ISDN & Customer   b) PBX & Customer

    c) PBX & ISDN   d) FAX & ISDN.

ix) Transmission line may be considered as an electrical circuit with

    a) lumped parameters   b) distributed parameters

    c) hybrid parameters   d) none of these.

x) In B-ISDN, minimum data rate can be

    a) 155 Mbps   b) 333 Mbps

    c) 600 Mbps   d) 165 Mbps.

xi) The supply voltage used in telephone exchange is

    a)   24 V   b)   48 V

    c)   12 V   d)   5 V.

xii) Traditional telephone lines can carry frequencies between

    a)   400 and 3400 Hz   b)   300 and 3600 Hz

    c)   300 and 3400 Hz   d)   300 and 3800 Hz.

GROUP – B

(Short Answer Type Questions)

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

2. Describe centralized SPC system. What is distributed SPC system ?

3. Draw the functional block diagram of a telephone set and explain each block.

4. What is BORSCHT function ? Why is this important in electronic exchanges ?

5. Explain the design consideration of DTMF dialing.

6. Explain the working principle of Strowger switching system.

GROUP – C

(Long Answer Type Questions)

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

7. Write down about different channels in ISDN. Write in brief about user network interface in ISDN. What is B-ISDN ?

                              6 + 6 + 3

8. a) Describe Switching hierarchy & routing.

   b) Explain level-1 & level-2 functions of a SS7 Signaling System.

   c) What are the advantages of Common Channel Signaling over Inchannel Signaling ?   6 + 6 + 3

9. a) What is Step by Step Switching ? Describe the selector hunter based access mechanism in Strowger System (Take the example of 100-line exchange)

    b) What is blocking of exchange ? In a 1000-line exchange, the number range 000-399 is allotted to business subscribers. 40% of these subscribers in each group of 100 are active during peak hours. The number range 400-999 is allotted to domestic connections. 10% of the domestic subscribers are active in each group at any time. Estimate they total number of final selectors.   8 + 7

10. Explain BORSCHT functions. Explain Subscriber loop systems. An exchange uses 40 V battery to drive subscriber lines. A resistance of 250Ω is placed in series with the battery to protect it from short circuit. The subscribers use a standard phone which offers a DC resistance of 50 Ω Microphone requires 23 mA for proper functioning. Determine the furthest distance at which the subscriber can be placed if 26A WG conductor is used.   4 + 4 + 7

    [Different characteristics of 26 AWG wire is given below :

    d = 0·41 mm

    R_{dc} = 133·9 Ω/km

    Loss = 0·69 dB/km]

11. Write short notes on any *three* of the following :   3 × 5

    a) Grade of Services and Blocking probability

    b) Digital PABX

    c) Wireless in local loop

    d) Principle of FAX transmission

    e) Signaling techniques.

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