Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS / B. TECH (ECE) / SEM-5 / EC-501 / 2010-11

2010-11

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) In fully connected Network with '*N*' modes number of link required is

a) $\frac{n(n-1)}{2}$ b) $\frac{n(n+1)}{2}$

c) $\frac{n}{2}$ d) $\frac{n^2}{2}$.

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ii) A switching network with unequal number of inlets and outlets is called

a) Symmetric Network b) Asymmetric Network

c) Folded Network d) None of these.

iii) In pulse dialing, the interdigit gap may be

a) 1 sec b) 10 sec

c) 200 msec d) 100 msec.

iv) In time division multiplexing 24 channel are to be multiplexed each with 2·5 Mbps data rates. The data rate of a given channel after multiplexing is

a) 60 Mbps b) 48 Mbps

c) 30 Mbps d) none of these.

v) MODEM stands for

a) Modulator demodulator

b) MUX DEMUX

c) DTE device

d) none of these.

vi) Switching capacity of a 6 × 6 crossbar switching system is

a) 6 b) 3

c) 12 d) 36.

vii) The unit of traffic intensity is

a) ampere b) ohm

c) erlang d) meter.

viii) The 60 minute interval in a day in which the traffic is the highest is called the

a) Busy hour

b) Peak busy hour

c) Time consistent busy hour

d) None of these.

ix) In 100 line exchange the subscriber number must be

a) 100 digit b) 2 digit

c) 10 digit d) 3 digit.

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x) ESS stands for

a) Electronic Switching System

b) Effective Electronic Switching System

c) Early Electronic Switching System

d) none of these.

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

a) NT 1 b) NT 2

c) TE 1 d) TE 2.

xii) Outband signaling uses

a) 0-3400 Hz b) 300-1200 Hz

c) 3400-4000 Hz d) 5000-6000 Hz.

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GROUP – B

(Short Answer Type Questions)

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

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

3. Explain the principle of DTMF dialing. 5

4. What do you mean by electronic space division switching ? Given MTBF = 2000hr and MTTR = 4 hr, calculate unavailability of single and dual processor systems. 5

5. Explain the difference between circuit switching and store & forward (S&F) switching technologies. 5

6. Write down the differences between in channel and common channel signaling. 5

GROUP – C

(Long Answer Type Questions)

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

7. a) Describe the operation of basic Time division time switching.

   b) Show that GOS = PB, where PB = Probability of blocking.

c) If the no. of calls during the busy hour is 3700 & the particular exchange is designed to handle 1700 calls during busy hour. Then what will be resulting GOS ?

8 + 4 + 3

8. a) Calculate the number of trunks that can be supported by time multiplexed space switch given that 24 channel are multiplexed in each frame, control memory access time 100 ns and bus switching access time is 100 ns.

b) Describe time division time switching and calculate the switching capacity of systems with respect to data and control memory access time. 5 + 10

9. What is the significance of subscriber local loop in telecom network ? Explain subscriber local loop architecture ? An exchange uses - 48 V battery, a resistance of 300 ohm is placed in series with the battery. If the telephone set resistance is 50 ohm, calculate the loop resistance limit for the minimum current requirement of 23 mA for carbon microphone. Calculate dc loop resistance, for the loop length of 10 km. 3 + 6 + 6

10. What is SS7 signaling system ? Draw its protocol stack and explain it. 5 + 10

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

a) RS – 232

b) ISDN

c) PABX

d) Data terminal equipment (DTE)

e) Distributed SPC.

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