



**ENGINEERING & MANAGEMENT EXAMINATIONS, DECEMBER - 2007**  
**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 × 1 = 10

i) The supply voltage used in telephone exchange is

- a) 24 V
- b) 48 V
- c) 12 V
- d) 5 V.

ii) Modem used for

- a) multiplexing
- b) modulation & demodulation
- c) remove noise in channel
- d) none of these.

iii) In 24 channel PCM signaling, each channel carries

- a) 2 signalling bits
- b) 1 signalling bit
- c) 4 signalling bits
- d) none of these.

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

- a) 20
- b) 10
- c) 5
- d) 15.

**5204**



- v) ISDN means
  - a) Integrated Services Digital Network
  - b) International System Digital Network
  - c) Indian Supply Direct Network
  - d) None of these.
  
- vi) When the control sub-system is outside the switching network, then the system is called
  - a) Direct Control
  - b) Common Control
  - c) Stored Program Control
  - d) None of these.
  
- vii) Peak busy hour depends on the consideration of
  - a) one day
  - b) over a number of days
  - c) over a month
  - d) over a year.
  
- viii) CHILL is a
  - a) CCITT Language
  - b) IEEE Language
  - c) IEE Language
  - d) ANSI Language.
  
- ix) In a Strouffer system, a high value of CCI indicates
  - a) good design
  - b) poor design
  - c) no impact on design
  - d) EUP data need to be checked.
  
- x) Loudspeaker is an end instrument of
  - a) transmitter side
  - b) receiver side
  - c) both (a) & (b)
  - d) none of these.



xi) In DTMF tone the frequency used are

- a) 697/1209 Hz
- b) 920/1478 Hz
- c) 220/540 Hz
- d) 50/120 Hz.

xii) GOS in India is

- a) 0.02
- b) 0.002
- c) 0.2
- d) 0.32.

**GROUP - B**

**( Short Answer Type Questions )**

Answer any *three* of the following.

3 × 5 = 15

2. How is call connection established in a step-by-step switching system ? Explain with block diagram. 3 + 2 = 5
3. What do you mean by electronic space division switching. Give MTBF = 2000 hr and MTTR = 4 hrs, calculate unavailability of single and dual processor system. 2 + 3 = 5
4. In a large city where there are many exchanges, what factors influence call routing ? How can these problems be solved ? 2 + 3 = 5
5. Explain level 1 & 2 functions of a SS7 signalling system. 5
6. Derive the Erlang's B formula. 5

**GROUP - C**

**( Long Answer Type Questions )**

Answer any *three* questions.

3 × 15 = 45

7. a) How are the signalling techniques classified ?
- b) Draw the block diagram of a voice frequency receiver of inband signalling and explain its principle.
- c) What are the disadvantages of a signalling ?
- d) What is non-associated CCS signalling ?
- e) What are the advantages of common channel signalling over inchannel signalling ? 2 + 5 + 3 + 3 + 2 = 15



8. Explain the difference between circuit switching and packet switching. Explain channel associated and channel non-associated common channel signalling. 8 + 7 = 15
9. a) What are GOS and Blocking probability ?
- b) During 1200 calls offered to a group of trunks 12 calls were lost. The average call duration was 3 minutes. Find the traffic offered and traffic carried in Erlang. Also find out the value of GOS and the total duration of period of congestion.
- c) Explain the working principle of a data communication link. 4 + 6 + 5 = 15
10. a) Over 20 min intervals, 40 subscriber initiate calls. Total duration of the calls is 4800 secs. Calculate the load offered to the N/W by the subscriber and the average subscriber traffic.
- b) Write down the differences of Grade of service and Blocking probability.
- c) Show that,  $GOS = PB$ ; where PB is blocking probability. 4 + 4 + 7 = 15
11. Explain the operation of two motion selector. Explain the configuration and working of Strowger switching system. 5 + 10 = 15

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