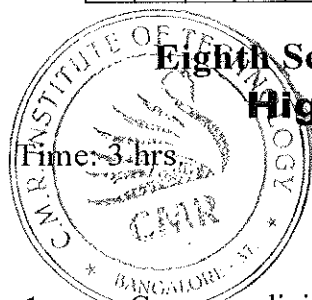


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10EC834/10TE835



**Eighth Semester B.E. Degree Examination, June/July 2016**

**High Performance Computer Network**

Max. Marks: 100

**Note: Answer FIVE full questions, selecting at least TWO questions from each part.**

**PART - A**

- 1 a. Compare digital carrier systems (DCS) hierarchy and synchronous transfer signal (STS) hierarchy with reference to medium, signal and data rates. (08 Marks)
- b. What are the two aspects of digitization? Explain the steps involved to digitize a signal. (06 Marks)
- c. A telephone network transmits a signal with frequency of 4 kHz and SNR is approximately equal to 48 dB. Find, i) Sampling rate ii) Number of bits per sample. iii) Bit rate of the signal. (06 Marks)
- 2 a. Explain open data network model with a neat diagram. (08 Marks)
- b. What is meant by network traffic? Explain different types of network traffic with suitable examples. (08 Marks)
- c. An optical link transmits a 10000 – bit packet with a transmission speed of 1 Mbps and its takes about 4  $\mu$ s to propagate through network. Find total delay experiences through the network. (04 Marks)
- 3 a. Draw the TCP header format and explain each field briefly. (06 Marks)
- b. Explain the steps involved in the connection establishment and connection termination procedure in TCP. (04 Marks)
- c. Explain window adjustment in TCP. Derive an expression for throughput (R) in terms of loss rate (L). (10 Marks)
- 4 a. Draw the different layers of SONET overhead and explain. (08 Marks)
- b. Draw the frame structure of telephony on passive optical network (TPON) for the downstream signal. (04 Marks)
- c. Draw ISDN architecture and explain. (08 Marks)

**PART - B**

- 5 a. Explain ATM header structure. (08 Marks)
- b. Explain ATM adaptation layer with a neat diagram. (06 Marks)
- c. If the link speed of STS-3 signal is 155 Mbps, given a cell size of 53 bytes, 80 percentage loading and one cell per unit time as service rate, calculate: i) Unit of time (per bit) ii) Average number of cells in the buffer. iii) Queuing delay. (06 Marks)
- 6 a. What is multiple access? List the various multiple access techniques. (07 Marks)
- b. What is spectral etiquette? List the etiquette rules. (06 Marks)
- c. Explain different architecture of wireless network. (07 Marks)
- 7 a. What are the basic control methods? Explain with time scales and types of information. (10 Marks)
- b. Write short notes on:
  - i) Internet Service Providers. (10 Marks)
  - ii) Empirical evidence. (10 Marks)
- 8 a. Explain the architecture of an optical cross connects. (08 Marks)
- b. Explain optical ring networks and hierarchical mesh networks. (06 Marks)
- c. Describe single-hop LANs with relevant diagrams. (06 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.