Fifth Semester B.E. Degree Examination, Dec.08/Jan.09
Computer Networks - I

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. What is data communications? What are its characteristics? Explain. **(06 Marks)**

b. Define following terms: (i) Protocol (ii) Internet **(04 Marks)**

c. Describe with neat diagram the functionalities of each layer in the OSI model. **(10 Marks)**

2 a. Calculate the Shannon channel capacity in following cases: **(06 Marks)**
(i) Bandwidth = 20 kHz $SNR_{dB} = 40$ (ii) Bandwidth = 200 kHz $SNR_{dB} = 6$

b. A file contains 3 million bytes. How long does it take to download this file using a 100 kbps channel? **(04 Marks)**

c. Define line coding. Describe Unipolar NRZ, Polar NRZ-L, Bipolar AMI & Manchester encoding by applying on the information sequence 101011100. **(10 Marks)**

3 a. We have four sources, each creating 250 characters/sec. If the interleaved unit is one character and 1 synchronising bit is added to each frame, find
(i) The data rate of each source.
(ii) The duration of each character in each source.
(iii) The frame rate
(iv) The duration of each frame
(v) The no. of bits in each frame, and
(vi) The data rate of the link. **(12 Marks)**

b. Define synchronous TDM. **(02 Marks)**

c. Describe ASL, FSK and PSK mechanisms and apply them over the digital data 101101. **(06 Marks)**

4 a. Briefly explain the coaxial cable and optical fiber with their applications. **(10 Marks)**

b. Explain how CRC is used in detecting errors for the following polynomial, $g(x)=x^4 + x + 1$. Consider the information sequence 1101011011.
(i) Find the codeword corresponding to this sequence.
(ii) If the codeword has error in third bit, what does receiver obtain when it does its error checking? **(10 Marks)**

PART – B

5 a. Explain selective repeat ARQ. Justify how selective repeat ARQ outperforms Go-back-N and Stop-and-wait ARQ. **(10 Marks)**

b. Explain point-to-point protocol frame format. Also briefly describe different transition phases of PPP in establishing a connection from home PC to ISP. **(10 Marks)**

6 a. Explain the following random access protocols: (i) CSMA (ii) CSMA/CD **(10 Marks)**

b. Discuss 802.3 MAC frame format. Mention the restrictions imposed on minimum and maximum lengths of a 802.3 frame. **(10 Marks)**

7 a. Discuss Bluetooth technology. **(10 Marks)**

b. Explain the working mechanism of following devices used to connect LANs. **(10 Marks)**
(i) Bridge (ii) Router.

8 a. What are the design goals of ATM? Briefly describe ATM layers. **(12 Marks)**

b. What is bit stuffing and unstuffing? Apply bit stuffing to the sequence: 0110111111111100
Apply unstuffing: 01111111000011101111101111101100111110 **(08 Marks)**

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