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06CS55

Fifth Semester B.E. Degree Examination, June/July 2019
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. Define Data Communication. With a neat diagram, explain the components of data communication. **(05 Marks)**

b. Define network topology. Explain Mesh topology with advantages and disadvantages. **(05 Marks)**

c. Explain with a neat diagram, functionalities of each layer in OSI reference model. **(10 Marks)**

2 a. Define line coding. Represent the sequence 1011001 in NRZ-L, NRZ-I, ME and DME schemes. **(10 Marks)**

b. Discuss the causes for transmission impairments with neat block diagrams. **(06 Marks)**

c. Calculate Shanon capacity in the following cases:
(i) BW = 20 kHz $SNR_{dB} = 40$ (ii) BW = 200 kHz $SNR_{dB} = 6$ **(04 Marks)**

3 a. Define multiplexing. Explain with neat diagram, different data rate management strategies. **(08 Marks)**

b. Define Direct Sequence Spread Spectrum (DSSS). Explain how it achieves bandwidth spread using appropriate diagrams. **(06 Marks)**

c. Four 1 kbps connections are multiplexed together. A unit is 1 bit. Find:
i) Duration of 1 bit before multiplexing ii) The transmission rate of link
iii) The duration of a time slot iv) The duration of a frame. **(06 Marks)**

4 a. Explain with neat diagrams, twisted pair and coaxial cable with applications. **(06 Marks)**

b. Obtain CRC codeword at sender site using generator polynomial $g(x) = x^3 + x + 1$ for the data 1001. Also show that the codeword is not corrupted at receiver site. **(08 Marks)**

c. List the steps undertaken by sender and receiver using Internet checksum for error detection with an example. **(06 Marks)**

PART – B

5 a. Discuss the two approaches used in variable size framing with a neat diagram. **(06 Marks)**

b. Explain the frame format of PPP protocol. **(06 Marks)**

c. Discuss with neat diagram stop-and-wait ARQ protocol. **(08 Marks)**

6 a. Explain any two control access methods with neat diagrams. **(06 Marks)**

b. A slotted ALOHA network transmits 200 bits frames using a shared channel with 200 Kbits/sec bandwidth. Find the throughput if the system produces:
i) 1000 frames/sec ii) 500 frames/sec **(06 Marks)**

c. Discuss IEEE802.3 MAC frame format. **(08 Marks)**

7 a. Explain the architecture of IEEE802.11. **(06 Marks)**

b. Differentiate between bus backbone network and star backbone network. **(06 Marks)**

c. Explain layers of Bluetooth with neat diagram. **(08 Marks)**

8 a. Discuss the architecture of ATM. **(06 Marks)**

b. Describe frequency reuse, handoff and roaming concepts in cellular telephony. **(08 Marks)**

c. Discuss the layers of SONET standard. **(06 Marks)**

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