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10CS55

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
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. Discuss in detail about the layers in OSI model with a neat diagram. **(10 Marks)**
b. Briefly explain different addressing modes used in TCP/IP protocol suite. **(05 Marks)**
c. Define protocol and identify the different elements of a protocol. **(05 Marks)**

2 a. For the given string 11011001 represent the unipolar, polar NRZ, Manchester and differential Manchester encoding techniques. **(05 Marks)**
b. Identify the different transmission impairments observed in data transfer. **(05 Marks)**
c. A telephone line has a bandwidth of 3000 Hz assigned for data communication. The SNR ratio is 3162. Calculate the capacity of the channel. (SNR refers to signal to noise ratio). **(05 Marks)**
d. Explain the concept of shift keying. **(05 Marks)**

3 a. Define multiplexing and elaborate it in the context of time division multiplexing. **(05 Marks)**
b. Elaborate the concept of circuit switches, datagram networks and virtual circuit networks with block diagrams. **(10 Marks)**
c. The advanced mobile phone system uses two bands. The first band of 824 to 849 MHz is used for sending and 869 to 894 MHz is used for receiving. Each user has a bandwidth of 30 kHz in each direction. The 3 kHz voice is modulated using FM, creating 30 kHz of modulated signal. How many people can use their cellular phones simultaneously? **(05 Marks)**

4 a. Discuss about Hamming distance used in error control. **(05 Marks)**
b. Briefly explain about linear block codes with emphasis on parity check code. **(05 Marks)**
c. For a Augmented data word of $x^6 + x^3$, and the divisor 1011 which is represented as $x^3 + x + 1$. Calculate the code word, by using cyclic code encoder using polynomials. **(10 Marks)**

PART – B

5 a. Compare and contrast the Go Back N-ARQ protocol with selective repeat ARQ. **(10 Marks)**
b. Define framing and explain its need in data link layer. **(05 Marks)**
c. Assume that, in a stop and wait ARQ system, the bandwidth of the line is 1 Mbps and 1 bit takes 20 ms to make a round trip. What is the bandwidth delay product? **(05 Marks)**

6 a. Define controlled access in MAC sublayer and explain the three methods in this category. **(10 Marks)**
b. Define channelization with its supporting protocols. **(05 Marks)**
c. A pure ALOHA network transmits 200 bit frames on a shared channel of 200 Kbps. What is the throughput if the system produces 1000 frames/sec. **(05 Marks)**

7 a. Explain the architecture used in IEEE 802.11 protocol. **(10 Marks)**
b. How is a repeater different from amplifier? **(05 Marks)**
c. What is GSM and explain its features. **(05 Marks)**

8 a. What is NAT and how can NAT help in address depletion? **(05 Marks)**
b. Compare and contrast the fields in the main headers of IPV4 and IPV6 protocols. **(10 Marks)**
c. Change the following IPV4 addresses from dotted decimal notation to binary notation:
i) 111.56.45.78 ii) 221.34.7.82 **(05 Marks)**

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