Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058, India

(Autonomous College Affiliated to University of Mumbai)

End Semester Examination - Synoptic

Nov 2018

Max. Marks: 60 | Duration: 180 Min

Class: T.E. | Semester: V

Course Code: CE51 | Branch: Computers

Name of the Course: Data Communication and Computer Networks

Instruction:

(1) All questions are compulsory

(2) Draw neat diagrams

(3) Assume suitable data if necessary

Q No.	Question	Max. Marks	CO
Q.1(a)	Why Delta Modulation is used in digital communication? How Modulator and Demodulator works in order to perform the Delta Modulation. **Answer:** Use of Delta Modulation - 1 marks Diagram of Modulator - 1 marks Working of Modulator - 2 marks Diagram of Demodulator - 1 marks Working of Demodulator - 1 marks	06	CO1
Q.1(b)	A periodic composite signal is made of four frequency which are 10MHz, 20MHz, 30 MHz and 110 MHz. The signal power is 150 W and noise power over the channel is 10 W. The signal is represented by 8 levels. Answer following (i) Find bandwidth of the signal? (ii) Find SNR_{db}? (iii) Find Nyquist Bit Rate? (iv) Find Shannon Capacity? **Answer:** (1 mark for correct answer along with formula)*4 - 4 marks	04	CO1
	OR		
	A complex low-pass signal has a bandwidth of 200 kHz and has SNR_{db} of 40. If we want to use PCM to convert analog signal to digital signal then answer following (i) Find minimum sampling rate for the signal? (ii) Find number of bits per sample for the signal? (iii) Find bit rate for the signal? (iv) Find minimum bandwidth of the digitized signal? **Answer:** (1 mark for correct answer along with formula)*4 - 4 marks	04	CO1
Q.1(c)	What are the advantages of Fibre Optic Cable over Twisted Pair cable and Coaxial Cable?(Any 4 points) **Answer:** (0.5 marks for each advantage)*4 - 2 marks	02	CO2

Q.2 (a)	A sender needs to send the four data items Ox3456, OxABCC, Ox02BC, and OxEEEE. Answer the following:(Show complete binary calculation for each case) (i) Find the checksum at the sender site. (ii) Find the checksum at the receiver site if the second data item is changed to OxABCE. (iii) Find the checksum at the receiver site if the second data item is changed to OxABCE and the third data item is changed to Ox02BA. **Answer:** (2 marks for each checksum calulation)* 3 - 6 marks	06	CO3
Q.2 (b)	A network with one primary and two secondary stations uses polling. The secondary station 1 wants to send data to secondary station 2. The size of data frame is 1000 bytes and Station 1 has 5 such frames which he would like to send. The Poll, Select, ACK and NAK are of 16 bytes. Primary Station polls secondary station 1 first. How many total bytes are exchanged if there is no limitation on the number of frames a station can send in response to a poll? (Draw communication diagram and show calculation.) **Answer:** Communication Diagram - 3 Marks Calculation of total bytes - 3 marks	06	CO3
Q.3 (a)	An organization is granted the block 211.17.180.0/24. The administrator wants to create 32 subnets. (i) Find the subnet mask. (ii) Find the number of addresses in each subnet. (iii) Find the first and last host addresses in subnet 1. (iv) Find the first and last host addresses in subnet 32. (v) Find broadcast address of the subnet 3 and subnet 6. (vi) Find network interface address of subnet 20 and subnet 24. **Answer:** (1 marks for each correct answer)* 6 - 6 marks	06	CO4
Q.3 (b)	In an IPv4 datagram, the M bit is 0, the value of HLEN is 5, the value of total length is 200, and the offset value is 200. (i) What is size of actual data? (ii) What is the number of the first byte and number of the last byte in this datagram? (iii) Is this the last fragment, the first fragment, or a middle fragment? Justify. (iv) IS data fragmented? Justify. **Answer:** Calculation of data size - 1 marks Calculation of first byte - 1 marks Calculation of last byte - 1 marks Answer of whether first, middle or last byte - 0.5 marks Justification - 1 mark Answer to whether fragmented - 0.5 marks Justification - 1 mark	06	CO4

Q.4 (a)	The following is a dump of a UDP header in hexadecimal format. 0632000D001CE217 (i) What is the source port number? (ii) What is the destination port number? (iii) What is the total length of the user datagram? (iv) What is the length of the data? (v) Is the packet directed from a client to a server or vice versa? (vi) What is the client process? **Answer:** (1 marks for each correct answer)*6 - 6 marks	06	CO4
Q.4 (b)	Consider an instance of TCP Additive Increase Multiplicative Decrease (AIMD) algorithm where the window size at the start of the slow start phase is 1 MSS and the threshold at the start of the first transmission is 8 MSS. (i) Assume that a timeout occurs during the Sixth transmission. Find the congestion window size at the end of the tenth transmission which was successful. Show congestion window size after each transmission. (ii) Assume that a three duplicate acknowledgements received during the sixth transmission. Find the congestion window size at the end of the tenth transmission which was successful. Show congestion window size after each transmission. **Answer:** Question (i): Calculation of Step-wise congestion window size - 3 marks Question (ii): Calculation of Step-wise congestion window size - 3 marks	06	CO3
Q.5 (a)	How does Remote Logging works? Justify the need of NVT in Remote Logging. **Answer:** Diagram of Remote Logging - 1 mark Working of Remote Loggin - 4 mark Justification of NVT - 1 marks **OR** What is the need of MIME in E-mail service? Draw and discuss MIME Header. **Answer:** Need of MIME in E-mail - 2.5 marks Header Format - 1 mark (0.5 mark for each field in the MIME header) * 5 - 2.5 marks	06 06	CO4 CO4
Q.5 (b)	Differentiate between OSPF and BGP. (Any 6 Points) **Answer:** (1 mark for each difference)*6 - 6 marks **OR** Differentiate between TCP and UDP.(Any 6 Points) **Answer:** (1 mark for each difference)*6 - 6 marks	06 06	CO4 CO4