P P SAVANI UNIVERSITY

Fifth Semester of B. Tech. Examination

November 2019

SECE3011 - Computer Networks

27.11.2019, Wednesday **Time: 09:00 a.m. To 11:30 a.m.** **Maximum Marks: 60**

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION – I

Q - 1	**Answer the following (Any Five)**	[05]
(i)	Define Network	
(ii)	Differentiate between simplex and half-duplex transmission.	
(iii)	Define: Protocol	
(iv)	Apply the Bit Stuffing: 0111101111101111110	
(v)	What is the vulnerable time of slotted ALOHA?	
(vi)	In which of this topology there is a central controller or hub a) Star b) Mesh c) Ring d) Bus	
(vii)	Which of the following method is error correction method? a) Hamming Code b) Cyclic redundancy check c) Checksum d) Piggybacking	
Q - 2 (a)	List out various layers of OSI model. Match the following to one or more layers of the OSI model: a) Route selection b) Mechanical, electrical, and functional interface c) Flow control d) Log-in and log-out procedures	[05]
Q - 2 (b)	The bandwidth of a channel is 4 MHz and its signal to noise ratio is 63. Calculate the appropriate bit rate and signal level.	[05]
	OR	
Q - 2 (a)	What do you mean by Topology in Network? List out different types of topologies and explain any three.	[05]
Q - 2 (b)	Four 1-kbps connections are multiplexed together using TDM. A unit is 1 bit. Find (a) the duration of 1 bit before multiplexing, (b) the transmission rate of the link, (c) the duration of a time slot, and (d) the duration of a frame.	[05]
Q - 3 (a)	The following bit stream is encoded using VRC, LRC and even parity. Locate and correct the error if it is present.11000011, 11110011, 10110010, 00001010, 00101010, 00101011, 10100011, 01001011, 11100001	[05]
Q - 3 (b)	What is the need of medium access sub layer along with data link layer? Categorize the various protocols used for multiple accesses on medium access sub layer.	[05]
	OR	
Q - 3 (a)	If the frame is 1101011011 and generator is $x^4 + x + 1$. What would be the transmitted frame if the sender and receiver using CRC for error detection. If the two bits are changed during transmission, how the errors can be detected at receiving side.	[05]
Q - 3 (b)	What are the disadvantages of Stop and Wait ARQ? How Go Back N ARQ overcomes the disadvantages of Stop and Wait ARQ? Explain the sending window and receiving window used in Go Back N ARQ.	[05]
Q - 4	**Attempt any one.**	[05]
(i)	How CSMA works? Explain the three persistence methods used in CSMA.	
(ii)	Prove that in CDMA, a receiving station can get the data sent by a specific sender if it multiplies the entire data on the channel by the sender's chip code and then divides it by the number of stations	

SECTION – II

Q - 1 **Answer the following(Any Five)** **[05]**

(i) Find the error, if any, in the given IPv4 address : 75.45.301.14

(ii) Suppose a TCP connection is transferring a file of 5000 bytes. The first byte is numbered 10,001. What are the sequence numbers for each segment if data are sent in five segments, each carrying 1000 bytes?

(iii) In an IPv4 packet, the value of HLEN is 1000 in binary. How many bytes of options are being Carried by this packet?

(iv) Transport layer protocols deals with

a) application to application communication c)process to process communication

b) node to node communication d) none of the mentioned

(v) Which TCP port is used by SMTP?

(vi) Example of user agents for e-mail is

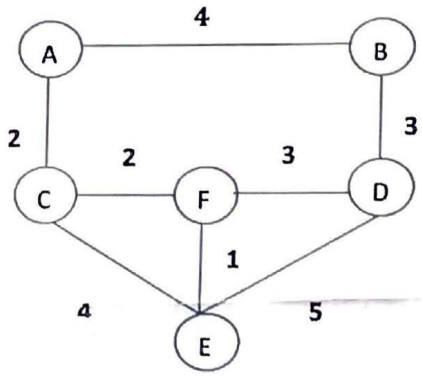
a) Microsoft Outlook b)Apple Mail c)Firefox d) None of the above

(vii) The default connection type used by HTTP is _____.

a) Persistent b)Non-Persistent c) Primary d) None of the mentioned

Q - 2 (a) Compare Datagram network with virtual circuit network. **[05]**

Q - 2 (b) Apply the distance vector routing algorithm and generate routing table for each router up to step-3 for given topology: **[05]**



OR

Q - 2 (a) Write a short note on TCP Segment. **[05]**

Q - 2 (b) Consider a router that interconnects three subnets: Subnet 1, Subnet 2 and Subnet 3. Suppose all the interfaces in each of these three subnets are required to have the prefix **230.1.17/24.** **[05]**

Also suppose that Subnet 1 is required to support up to **60** interfaces, Subnet 2 is required to support up to **90** interfaces and Subnet 3 is required to support up to **12** interfaces. Provide three network addresses (of the form a.b.c.d/x) that satisfy these constraints.

Q - 3 (a) Explain TCP Connection establishment using three way handshaking methods. **[05]**

Q - 3 (b) Briefly explain UDP with operations **[05]**

OR

Q - 3 (a) Write a short note on DNS. **[05]**

Q - 3 (b) Explain various congestion control mechanism on Network Layer in detail. **[05]**

Q - 4 **Attempt any one.** **[05]**

(i) Write a short note on HTTP.

(ii) Write a short note on ICMP protocol.

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