Roll No.: _____

Amrita Vishwa Vidyapeetham

B.Tech Degree (Supplementary) Examination – June 2023

Fifth Semester

Computer Science and Engineering

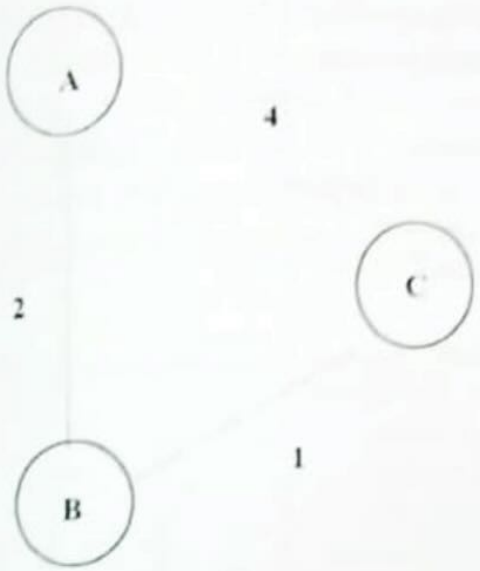
15CSE312- 19CSE301 Computer Networks

Time : 3 hrs. Maximum Marks: 100

Answer All Questions

Qn No.	Questions	Marks	CO	Blooms Taxonomy level
1	Consider different activities related to email: m1: Send an email from a mail client to a mail server m2: Allows multiple devices at a time to access and read the available mails. m3: Checking email in a web browser Which is the application layer protocol and port number used in each activity? **Justify your answer.**	3	CO2	L1
2	Is it possible for an organization's Web server and mail server to have exactly the same alias for a hostname (for example, foo.com)? What would be the type for the Resource Record (RR) that contains the hostname of the mail server?	3	CO2	L2
3	Consider a new peer Alice that joins BitTorrent without possessing any chunks. Without any chunks, she cannot become a top-four uploader for any of the other peers, since she has nothing to upload. How then will Alice get her first chunk?	3	CO1	L4
4	Suppose that a Web server runs in Host C on port 80. Suppose this Web server uses persistent connections, and is currently receiving requests from two different Hosts, A and B. Are all of the requests being sent through the same socket at Host C? Justify your answer.	3	CO3	L3

5	Suppose Host A sends two TCP segments back to back to Host B over a TCP connection. The first segment has sequence number 60; the second has sequence number 81. a. How much data is there in the first segment? b. Suppose that the first segment is lost but the second segment arrives at B. In the acknowledgment that Host B sends to Host A, what will be the acknowledgment number?	3	CO3	L3
6	How does a router within an Autonomous system (AS), know how to route a packet to a destination that is outside the AS? Assume that AS is associated with more than one gateway router that is inter connected with different AS's.	3	CO4	L2
7	How many Class B networks are available? How many hosts can be configured in each network.	3	CO4	L1
8	Given the CIDR representation of an IP address is 100.1.192.10 /18. Find the range of IP Addresses in the CIDR block.	3	CO4	L3
9	If a network on the Internet has a subnet mask of 255.255.192.0, then what is the maximum number of hosts possible per subnet?	3	CO4	L3
10	What is the significance of the Time-to-Live (TTL) field in a datagram? If this field is empty in a datagram, what is the consequence?	3	CO4	L2
	PART B			
11	a. Point out the factors influencing queuing delays. b. Graphically express Dependence of average queuing delay on traffic intensity. c. Mathematically describe the condition in which queuing delay approaches infinity.	5	CO1	L2
12	Suppose within your Web browser you click on a link to obtain a Web page. The IP address for the associated URL is not cached in your local host, so a DNS lookup is necessary to obtain the IP address. Suppose that ' n' DNS servers are visited before your host receives the IP address from DNS; the successive visits incur an RTT of RTT1, . . ., RTTn. Further suppose that the Web page associated with the link contains exactly one object, consisting of a small amount of HTML text. Let RTT0 denote the RTT between the local host and the server containing the object, neglecting the transmission times. a. How much time elapses from when the client clicks on the link until the client receives the object? b. suppose the HTML file references eight very small objects on the same server. How much time elapses with Non-persistent HTTP connection with no parallel TCP connections?	5	CO2	L3
13	Draw the FSM corresponding to the Server side for connection management in TCP.	5	CO3	L1

14	How does the efficiency of CSMA/CD algorithm vary with respect to the propagation delay and transmission delay between two nodes? Give proper justification.	5	CO5	L4
15	A group of N stations shares a 56kbps pure ALOHA channel. Each station outputs a 1000-bit frame on an average of once every 100 sec, even if the previous one has not yet been sent (e.g., the stations are buffered). What is the maximum value of N?	5	CO5	L5
16	A datagram of size 1000 bytes arrives at a router and must be forwarded to a link with an MTU of 100 bytes. How many fragments are created? Find the offset for each fragment. Assume the original datagram is stamped with an ID of 70.	5	CO4	L3
	PART C			
17	Using Distance Vector Algorithm, find the shortest path from node A to all other nodes in the network shown below. Show the step-by-step updates of routing information. 	10	CO4	L3
18	Consider that you are a network administrator and you are given an address space 200.10.160.0/20 and have been asked to assign IP addresses in an efficient manner for the machines as follows: Lab Name / No: of **Hosts** Lab 1 / 1000 Lab 2 / 500 Lab 3 / 200 Lab 4 / 60 Lab 5 / 25	10	CO4	L6