Code No: **20CS3503/20IT3503**

PVP SIDDHARTHA INSTITUTE OF TECHNOLOGY
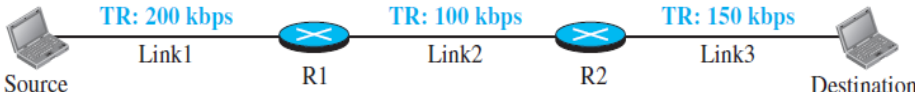**(Autonomous)**

COMPUTER NETWORKS MODEL PAPER
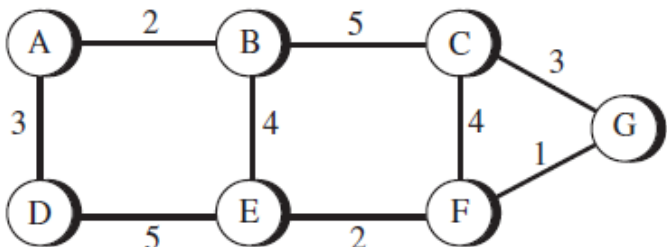**(Common to CSE, IT)**

Duration: 3 Hours   **Max. Marks: 70**

Note: 1. This question paper contains 5 essay questions with an internal choice.
2. Each question carries 14 marks and may have sub questions.
3. All parts of Question paper must be answered in one place

_____

5 x 14 = 70 Marks

			Blooms Level	CO	Max. Marks
**UNIT-I**					
1	(a)	**Illustrate** the differences and commonalities between the TCP/IP and OSI models.	L2	CO1	7
	(b)	**Apply** G = ½ , G=1 for Slotted ALOHA and find out the effect of it on throughput	L3	CO2	7
**OR**					
2	(a)	**Make use of** Cyclic Redundancy Check mechanism for the following data: Code word: 1001, Divisor: 1011 and check whether frame is transmitted successfully or not.	L2	CO2	7
	(b)	DLL at a device has 3 one byte frames sent as a data stream by the physical layer; state any one mechanism that the DLL adapt at the senders end so that the receiving end can identify the frames from the received stream of data from physical layer. **Illustrate** the above scenario with a suitable example.	L3	CO2	7
**UNIT-II**					
3	(a)	**Illustrate** how Packet Switching is used as a connectionless service with an example showing the forwarding/routing tables at each and every router.	L2	CO3	7
	(b)	The CIDR notation of a IP address is as follows: 167.199.170.82/27 i) What type of address is the above(Host/network/broadcast)? ii) What is the network address? iii) What are the total numbers of hosts that can be connected in that network? iv) What is the subnet mask? v) What is the broadcast address of that network?	L3	CO3	7
**OR**					
4	(a)	In the Figure, assume that the link between R1 and R2 is upgraded to 170 kbps and the link between the source host and R1 is now downgraded to 140 kbps. What is the throughput between the source and destination after these changes? Which link is the bottleneck now?	L2	CO5	7

	(b)	Both NAT and DHCP can solve the problem of a shortage of addresses in an organization, but by using different strategies. **Justify** the usage of each of these strategies.	L3	CO 5	7

UNIT-III

5	(a)	An IP datagram has arrived with the following partial information in the header (in hexadecimal): 45000054 00030000 2006... a. What is the header size? b. Are there any options in the packet? c. What is the size of the data? d. Is the packet fragmented? e. How many more routers can the packet travel to? f. What is the protocol number of the payload being carried by the packet?	L3	CO3	7
	(b)	**Calculate** the distance vectors of every node during the iterations, for the given graph using Distance Vector Routing. 	L4	CO5	7

OR

6	(a)	A 4000 byte IP datagram is divided into 3 fragments of 1400, 1400 & 1200 bytes each. **Illustrate** with a tidy diagram of IPv4 header depicting the values of each and every field used for fragmentation.	L3	CO3	7
	(b)	**Compare** and contrast the IPv4 header with the IPv6 header. Create a table to compare each field.	L2	CO3	7

UNIT-IV

7	(a)	**Demonstrate** how connection management is done in TCP	L2	CO4	7
	(b)	The following is the content of UDP Header In Hexadecimal format **CB84000D001C001C** What is the source port no, Destination Port No, Total length of UDP Datagram, length of Data and the Client Process	L3	CO3	7

OR

8	(a)	**Identify** fields in TCP Header that are not present in UDP Header along with details and give reasons for the missing fields.	L3	CO4	7
	(b)	Suppose a TCP connection is transferring a file of 5000 bytes. The first byte is numbered 10001. What are the sequence numbers for each segment if data are sent in five segments, each carrying 1000 bytes? Demonstrate the above scenario using Flow diagram showing the Sequence Numbers, Acknowledgement Numbers, & Flags.	L3	CO5	7

UNIT-V

9	(a)	**Summarize** about Request and Response message formats in HTTP along with an example for each	L2	CO4	7
	(b)	In FTP, Assume a client with user name john needs to store a video clip called *Video2* on the directory */top/videos/general* on the server. Show the commands and responses exchanged between the client and the server if the client chooses ephemeral port number 56002.	L3	CO5	7

		OR			
10	(a)	**Illustrate** Electronic Mail Architecture in detail.	L2	CO4	7
	(b)	**Show** your understanding about components of Secure Shell (SSH) for various Applications.	L3	CO4	7

CSE: 1)   2)