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VIT®

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

Continuous Assessment Test I – January 2023

Programme	:	B. Tech (CSE and its Specializations)	Semester	:	Winter'22-23
Course	:	Computer Networks	Code	:	BCSE308L
			Class Nbr	:	G2+TG2
Faculty	:	Dr. PRASAD M Dr. AMRIT PAL Prof. SAHAYA BENI PRATHIBA Dr. S A AMUTHA JEEVAKUMARI Prof. NOEL JEYGAR ROBERT V Dr. RENJITH Prof. RAJESH KUMAR	Slot	:	CH2022235001301 CH2022235001271 CH2022235001268 CH2022235000944 CH2022235001270 CH2022235001302 CH2022235000943
Time	:	90 Minutes	Max. Marks	:	50

Answer ALL the questions

Q.No.	Sub. Sec.	Questions	Marks
1.		(i) There are 20 nodes in a fully connected mesh of an academic lab. Find the maximum number of links and ports required for each node and the total number of links used in the network. [4 marks] (ii) For the academic lab network, choose and justify the best topology method considering the network's future growth, cable length, and other vital parameters as a cost-effective solution. [6 marks]	10
2.		As a Network Engineer, provide solutions for the following scenarios with a detailed explanation: (i) Your company is experiencing slow network speeds and frequent connection drops on its network. Using the OSI model, explain the steps you would take to troubleshoot and resolve the issue. [2 Marks] (ii) Your company is implementing a new security protocol to encrypt all network communications. Using the OSI model, explain the steps involved in implementing the new protocol and how it will affect each layer of the OSI model. [2 Marks] (iii) Your company is planning to upgrade its network infrastructure to support the latest technologies and protocols. Using the OSI model, explain how the upgrade will affect each layer of the OSI model and the benefits it will bring to the network. [2 Marks] (iv) Your company is planning to integrate a new application that requires real-time communication and low latency. Using the OSI model, explain how the application will interact with the network and what modifications, if any, need to be made to the network to support the new application. [2 Marks] (v) Your company has multiple branches and they are using different networking equipment and protocols. Using the OSI model, explain the steps you would take	10

to integrate these different networks and ensure seamless communication between all branches. [2 marks]

3. (i) Suggest a switching method that is low in error rate to connect four offices of GHY Corporation at Mumbai North, Mumbai South, Mumbai East, and Goa. [6 Marks]

(ii) Will you recommend switched virtual circuit or permanent virtual circuit for these connections? Justify. [4 Marks] **10**

4. (i) Calculate the bandwidth which can be achieved using a bit duration of 8 microseconds. Based on this bandwidth, calculate the time taken to transfer 100MB of data from the sender to the receiver. Consider the distance between the sender and receiver as 1000 km and the speed of the signal as 2*10^8m/sec. [4 Marks] **10**

(ii) Find out the type of networks used at your school or place of work. Also, describe the network types, topologies, and switching methods used there with a neat diagram. [6 Marks]

5 VITCC is planning to integrate a new application that requires real-time communication and low latency. Using the TCP/IP model, explain how the application will interact with the network and what modifications, if any, need to be made to the network to support the new application. **10**

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