VIT

Vellore Institute of Technology

School of Computer Science Engineering and Information Systems

Fall Semester 2024-2025

Continuous Assessment Test – I

Programme Name & Branch: MCA | **SLOT: D2+TD2**

Course Name: Data Communication and Networking | **Course code: PMCA505L**

Class Number (s): VL2024250103209, 3149, 3248 | **Exam Duration: 90 Min.**

Faculty Name (s): Prof.Jayalakshmi P, Prof. Thandeeswaran R, Prof. Asis Kumar Tripathy | **Maximum Marks: 50**

Q.No.	Question	Max Marks
1.	Enumerate the services provided by layer N to layer N+1 in layered architecture. Explain with service model. Identify and mention the functions of the protocol for each layer of the model.	10
2.	A network topology is a layout pattern and connectivity scheme between the devices in a network. Discuss the topology types with a neat sketch with its advantages and disadvantages.	10
3.	A) Four channels are multiplexed using TDM. If each channel sends 100 bytes/s and we multiplex 1 byte per channel, show the frame traveling on the link, the size of the frame, the duration of a frame, the frame rate, and the bit rate for the link. **(2.5 Marks)** B) If a periodic signal is decomposed into five sine waves with frequencies of 100, 300, 500, 700, and 900 Hz, what is its bandwidth? Draw the spectrum, assuming all components have a maximum amplitude of 10 V.**(2.5 Marks)** C) A nonperiodic composite signal has a bandwidth of 200 kHz, with a middle frequency of 140 kHz and peak amplitude of 20 V. The two extreme frequencies have an amplitude of 0. Draw the frequency domain of the signal.**(2.5 Marks)** D) A signal travels from point A to point B. At point A, the signal power is 100 W. At point B, the power is 90 W. What is the attenuation in decibels? **(2.5 Marks)**	10

4.	Five equal-size datagrams belonging to the same message leave for the destination one after another. However, they travel through different paths as shown in the Table. *Datagram* | *Path Length* | *Visited Switches* 1 | 3200Km | 1,3,5 2 | 11,700 Km | 1,2,5 3 | 12,200 Km | 1,2,3,5 4 | 10,200 Km | 1,4,5 5 | 10,700 Km | 1,4,3,5 We assume that the delay for each switch (including waiting and processing) is 3, 10, 20, 7, and 20 ms respectively. Assuming that the propagation speed is 2×10^8 m/s, find the order, the datagrams arrive at the destination and the delay for each. Ignore any other delays in transmission.	10
5.	Do WAN technologies (Frame Relay and ATM) need any switching technique for its data travel? Identify the type of switching technique used and elaborate the working of it in detail.	10