



VIT

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

Reg. Number: _____

Continuous Assessment Test (CAT) I – JAN'2025

Programme	: MCA	Semester	: WINTER 24-25
Course Code & Title	: PMCA505L – Data Communication and Networking	Class Number	: CH202450501725
Course Title	: DR. DINAKARAN M	Slot	: E1+TE1
Faculty	: 90 Minutes	Max. Mark	: 50

Answer ALL questions

Q. No.	Description	Marks
1.	<p>A company wants to establish a communication system between its offices in different locations across a metropolitan city. They are considering the following approaches</p> <ul style="list-style-type: none">• Using standardized protocols to ensure smooth data communication.• Implementing the OSI model to structure their network communication. <p>Describe how the company can use the OSI model to achieve seamless communication. Explain the role of each layer of the OSI model in the system, and provide a practical example for at least three layers along with the suitable list of protocols.</p>	[10]
2.	<p>A start up with limited budget and space needs to set up a network connecting 10 devices (computers and printers) in their single office. The key requirements are as follows:</p> <ul style="list-style-type: none">• Minimal cabling to reduce costs.• High reliability for critical operations.• Easy identification of network faults. <p>Recommend a suitable network topology for the start up. Justify your choice by comparing at least three types of topologies, focusing on their advantages, disadvantages, and suitability for the given scenario.</p>	[10]
3.	<p>An internet service provider (ISP) is planning to lay a communication network across a hilly region. The ISP encounters challenges due to transmission impairments. Explain how the ISP can minimize the impact of these impairments during network design. Propose solutions for each type of impairment and justify how these solutions will improve signal quality.</p>	[10]
4.	<p>A hospital network requires real-time communication between departments for patient monitoring. The network should provide support for</p> <ul style="list-style-type: none">• Dedicated communication channels for emergency alerts.• Dynamic resource sharing for non-critical data. <p>Suggest the best switching technique and justify your choice with examples of how it meets the hospital's requirements.</p>	[10]
5.	<p>An online gaming platform relies on a packet-switched network to connect players worldwide. Players often report delays and data loss during high-traffic periods, affecting their gaming experience. Identify the challenges of using packet switching for real-time applications. Propose techniques or strategies to reduce delays and data loss, and explain how these solutions will enhance the gaming experience.</p>	[10]