

**VIT**Vellore Institute of Technology
(Deemed to be University under Section 3 of U. Act, 1956)
CHENNAIReg. Number: **Continuous Assessment Test (CAT) – II - APR 2024**

Programme	:	MCA	Semester	:	WIN 23-24
Course Code & Course Title	:	PMCA505L / Data Communication and Networking	Class Number	:	CH2023240501381
Faculty	:	Dr. R. Sendhil	Slot	:	C1+TC1
Duration	:	1 hr 30 mins	Max. Mark		50

General Instructions:

- Write only your registration number on the question paper in the box provided and do not write other information.
- Use statistical tables supplied from the exam cell as necessary
- Use graph sheets supplied from the exam cell as necessary
- Only non-programmable calculator without storage is permitted.

Answer all questions

Q. No	Sub Sec.	Description	Marks
1		A hospital is planning to upgrade its communication network to support telemedicine services and electronic health records effectively. They prioritize minimal data loss, high efficiency, and low latency to ensure real-time consultations and seamless access to patient data. As an expert in networking technologies, recommend the most suitable transmission media and network architecture to meet these healthcare-specific requirements. Justify your answer with one suitable diagram for each requirement illustrating the proposed network setup.	10 Marks
2		A secret data is sent by Mr. Edward to Mr. Jenna. Your task is to elaborate the different switching techniques that can be used to send data with necessary diagrams.	10 Marks
3	a.	Apply any three error detection methods except CRC for the given bit sequence 0110011 1101001 1110011 0001100 and discuss the disadvantages of each method. [Use Even Parity wherever required] [5 Marks]	10 Marks
	b.	Calculate Cyclic Redundancy Check (CRC) in both sender side and receiver side for the given Message (M) = 1010001101 and divisor pattern (D) = 110101. [5 Marks]	
4		<p>Imagine a university campus that has implemented a pure ALOHA network for student dormitories. The network allows students to upload and download study materials, collaborate on projects, and access online resources. The shared channel operates at a speed of 200 kbps.</p> <p>Students in the dormitories use various devices to access the network, such as laptops, tablets, and smartphones. The network experiences different traffic levels during peak study hours, with varying frame production rates across different time periods.</p> <p>Based on the given information about the pure ALOHA network and frame sizes, consider the following scenarios and calculate throughput:</p> <p>i. During exam preparation periods, the network experiences high demand, and students collectively produce 1000 frames per second, and each frame</p>	10 Marks

		<p>transmits 200 bits for uploading and downloading study materials. [4 Marks]</p> <p>ii. In regular study sessions, the frame production rate decreases, and students generate 500 frames per second and each frame transmits 175 bits to access online lectures and collaborative platforms. [3 Marks]</p> <p>iii. Late at night when fewer students are actively using the network, the frame production rate further reduces to 250 frames per second and each frame transmits 300 bits for casual browsing and research. [3 Marks]</p>	
5		<p>A telecommunication company deploys a fiber-optic network to offer high-speed internet services to residential and business customers. They want to implement efficient data transmission mechanisms to maximize bandwidth utilization and minimize latency. Write details to apply the DLC protocol in this network environment to achieve optimal performance and customer satisfaction.</p>	10 Marks

*****All the best *****