REG.NO.:

VIT

Vellore Institute of Technology

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

SCHOOL OF COMPUTER SCIENCE ENGINEERING AND INFORMATION SYSTEMS

CAT-1

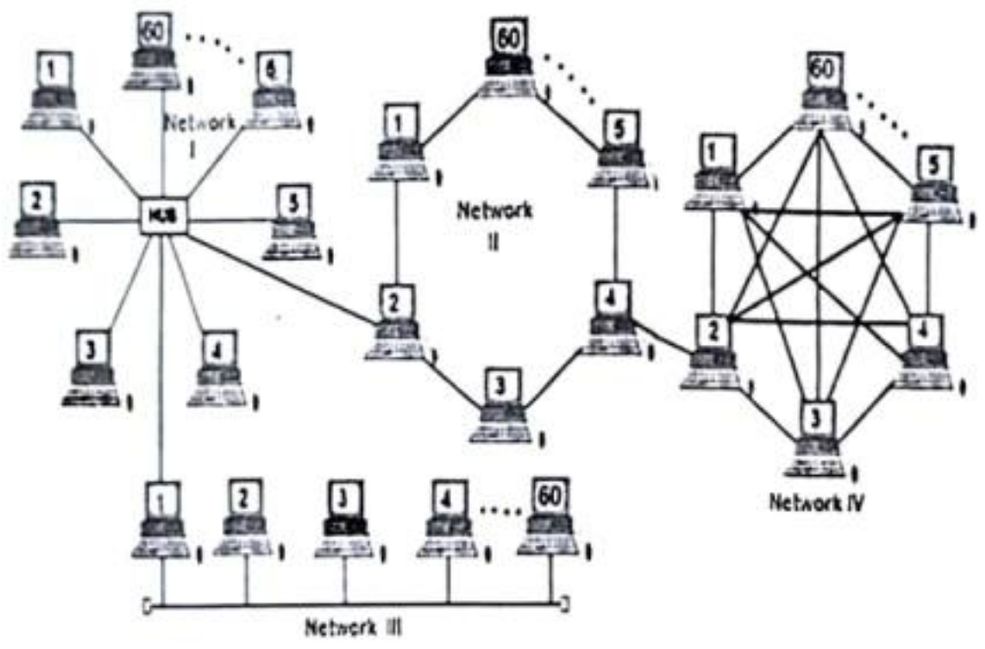
FALL SEMESTER 2026-2027

SLOT: C2+TC2

Programme Name & Branch	: B.Tech & BDE, BYB		
Course Code and Course Name	: BCSE308L - Computer Networks		
Faculty Name(s)	: Dr C NAVANEETHAN, DR VIJAYAN R		
Class Number(s)	: VL2026270102538 , VL2026270102540		
Date of Examination	: 11.08.2026		
Exam Duration	: 90 minutes	Maximum Marks: 50	

General instruction(s):

- Answer All Questions
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)
- Course Outcomes (Type the CO statements covered in this question paper. Use the CO number as per the syllabus copy)

Q. No	Question	M	CO	BL
1.	Suppose there are **240** devices connected together in the network below.  i. Determine the type of topology used by each network. (2.5 marks) ii. Identify the total number of I/O ports required per device in each network. (2.5 marks) iii. Calculate how many dedicated links are required to connect to each network. (2.5 marks) iv. For each of the above networks, discuss the consequences of a connection failure. (2.5 marks)	10	CO1	BL2
2.	Assume Sender 'X' residing in Dallas wants to share information with Receiver 'Y' residing in Chennai for a new project implementation. The data must travel through several networks to reach the destination. Illustrate how information sharing is incorporated using various layers of TCP/IP model. Also list out the addresses used in each layer of the model.	10	CO1	BL3
3.	Consider an application that transmits data at a steady rate (Sender generates an N-bit data unit every k time units, where k is small and fixed). When the	10		BL4

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	application starts, it will continue to run for a relatively long period of time. For the given scenario, identify the following a) Which switching technique will be more appropriate for the application (packet-switching or circuit-switching). Justify with suitable explanation. (5 marks) b) How propagation delay and processing delay influence the choice of switching? (2 marks) c) Is sending data in large chunks will be effective or dividing them into smaller packets will improve the performance? Justify with suitable example.(3 marks)		CO2	
4.	A.) A path in a digital circuit-switched network has a data rate of **2 Mbps**. A **total of 2000 bits** are exchanged during the setup and teardown phases. The distance between the two communicating parties is **6000 km**. Assume the propagation speed is **2×10^8 m/s** and include both transmission and propagation delays for setup, data transfer, and teardown. **a)** Calculate the total delay if **2000 bits** of user data are transmitted. (2.5 Marks) **b)** Calculate the total delay if **2,000,000 bits** of user data are transmitted. (2.5 Marks)	10	CO2	BL3
	B). A network with bandwidth of 10 Mbps can pass only an average of 12,000 frames per minute with each frame carrying an average of 10,000 bits. What is the throughput of this network? **(2 Marks)**. C). A network has a bandwidth of 1 Gbps. Calculate the propagation delay and the transmission delay for transmitting a 2.5-kbyte message. Assume that 1 kbyte = 1000 bytes, the distance between the sender and the receiver is 12,000 km, and the propagation speed is 3×10^8m/s. **(3 Marks)**			
5.	The message **HELLO WORLD!** has to be transferred. At the sender end, determine the internet checksum and the transmitted data. How does the receiver conclude that there is no error in the received message? Show the calculations at the receiver end if there are no errors. **(5 marks)** **ASCII-Hexadecimal table** B.) A sender wants to transmit the message 110101 using a CRC with a generator polynomial. $G(x)=x^3+x+1$. Identify the transmitted codeword. **(5 marks)**	10	CO3	BL3

Symbol	A	B	C	D	E	F	G	H
Hex Value	41	42	43	44	45	46	47	48
Symbol	I	J	K	L	M	N	O	P
Hex Value	49	4A	4B	4C	4D	4E	4F	50
Symbol	Q	R	S	T	U	V	W	X
Hex Value	51	52	53	54	55	56	57	58
Symbol	Y	Z	<space>	!				
Hex Value	59	5A	20	21				

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