



VIT

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

Reg. Number: _____

Continuous Assessment Test(CAT) – I - FEB 2024

Programme	:	B.Tech (ECE)	Semester	:	WS2023-24
Course Code & Course Title	:	BECE401L & Computer Communications and Networks	Class Number	:	CH2023240502624 CH2023240502629 CH2023240502631 CH2023240502627 CH2023240502622
Faculty	:	Dr. Jayavignesh T Dr. Kalaivanan K Dr. Nitish Katal Dr. Saranya Nair Dr. Sivakumar S	Slot	:	D1+TD1
Duration	:	90 Minutes	Max. Mark	:	50

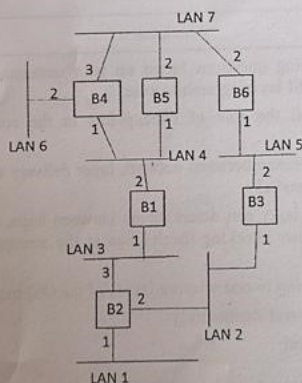
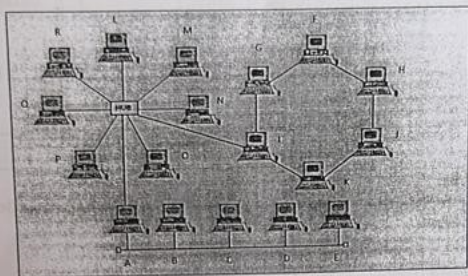
General Instructions:

- 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.		<p>Answer the following questions based on your understanding on the functions of ISO/OSI layering architecture.</p> <p>i) Discuss in detail the role of checkpoints in the communication process. [2 marks]</p> <p>ii) What is the difference between network layer delivery and transport layer delivery? [2 marks]</p> <p>iii) If the data link layer can detect errors between hops, why do you think we need another checking mechanism at the transport layer? [2 marks]</p> <p>iv) Match the following to one or more layers of the OSI model:</p> <ul style="list-style-type: none"> i. Segmentation and Reassembly ii. Route selection iii. Compression iv. Provides user services such as e-mail and file transfer <p>[2 marks]</p> <p>v) Comment on the shortcomings of the OSI layered model which leads to the success of current Internet model. [2 marks]</p>	10
2.		Consider the hybrid topology shown in Fig.1 and hence answer the following questions :	10

- i) Discuss the security issues of different topologies involved. [2.5 marks]
- ii) Comment on the consequences if the hub fails. [2.5 marks]
- iii) Suppose if A sends a data packet to H, how does the communication happen? Which nodes will receive the packet? [2.5 marks]
- iv) Can Q communicate with E if the device B fails? Explain your answer. [2.5 marks]



Consider the network shown in Fig. 2 where a number of LANs are connected by transparent bridges with ports. Illustrate step-by-step, how do the bridges organize themselves to avoid packets looping through within the network and form a loop-free network.

Consider the network shown in Fig. 3 where all LANs are connected by transparent bridges. Starting with an empty forwarding table at each bridge, try to build a forwarding table step-by-step for each bridge of the Ethernet based on the following transmissions:-

- i) Station A sends frames to station C
- ii) Station C sends frames to station A
- iii) Station E sends frames to station I
- iv) Station I sends frames to station E
- v) Station E sends frames to station B.

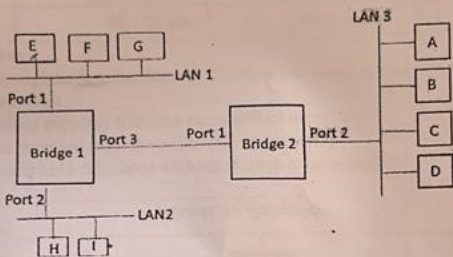


Fig. 3

The CRC-8 polynomial is given as $x^8 + x^2 + x + 1$.

Justify your answer for the following:

- a)
 - i) Does it detect a single error. [1 mark]
 - ii) Does it detect a burst error of size 6. [1 mark]
 - iii) What is the probability of detecting a burst error of size 9? [1 mark]
 - iv) What is the probability of detecting a burst error of size 15? [1 mark]
- b) Suppose that a message 1001 1100 1010 0011 is transmitted using Internet Checksum (4-bit word). What is the value of the checksum?
- c) Assume we are sending data items of 16-bit length. If two data items are swapped during transmission, can the traditional checksum detect this error? Justify your answer.

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