


VIT

Vellore Institute of Technology

Final Assessment Test – November 2024

Course: BITE305L - Computer Networks

Class NBR(s): 3358/3364/3370

Time: Three Hours

Slot: B2+TB2

Max. Marks: 100

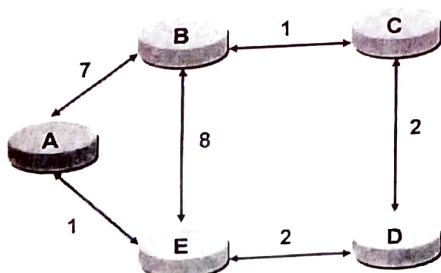
- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

 Answer ALL Questions

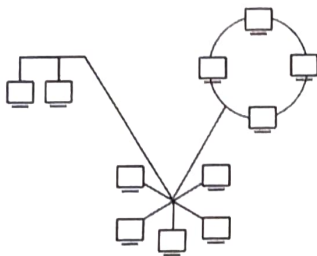
(10 X 10 = 100 Marks)

1. The presentation of data is becoming more and more important in today's Internet. Some people argue that the TCP/IP protocol suite needs to add a new layer to take care of the presentation of data. If this new layer is added in the future, where should its position be in the suite? Redraw the TCP/IP model diagram to include this layer and explain the functionalities of all the layers.
2. Design a three-stage 200×200 switch ($N = 200$) with $k=4$ and $n=20$. Also redesign the switch using clos criteria with a minimum number of cross points.
3. A bit stream 1110010101 is transmitted using the standard CRC method. The generator polynomial is x^3+x^2+1 .
 - a) What is the actual bit string transmitted?
 - b) Suppose the second bit from the left is inverted during transmission. How will receiver detect this error?
4. a) An IP packet of size 1600 bytes passes through network segment before it reaches its destination. The header size of this packet is 30 bytes. The maximum size of an IP packet in intermediate network (MTU) is 1400 bytes. How the IP packet would be fragmented in a router. Find all the information for each fragment. [5]

b) In an IPV4 packet, the value of HLEN is 6_{16} and the value of the total length field is 0038_{16} . How many bytes of data are being carried by this packet? [5]
5. Analyse the below given figure and construct the routing tables for all the nodes using distance vector routing algorithm.



6. Assume a TCP client is expecting to receive byte 3001. It receives a segment with the sequence number 3001 that carries 400 bytes. If the client has no data to be sent at this moment and has acknowledged the previous segment, what is the reaction of the TCP client to this event? Justify your answer with appropriate TCP connection diagrams.
7. Alice has a video clip that Bob is interested in getting; Bob has another video clip that Alice is interested in getting. Bob creates a web page and runs an HTTP server. How can Alice get Bob's clip? How can Bob get Alice's clip? Demonstrate with a neat sketch.
8. Analyse the below given diagram and find the topology. Also mention the advantages and disadvantages of the identified topology.



- 9.a) A pure ALOHA network transmits 250-bit frames on a shared channel of 100 kbps. What is the throughput if all stations together produce the following frames?
 - i) 1000 frames per second ii) 250 frames per second

OR

- 9.b) Encode the data 1011011 using even parity hamming codes and identify the error in the message generated by using the parity bits.
- 10.a) A company is granted the site address 181.56.0.0. The company needs 1000 subnets. Design the subnets.

OR

- 10.b) A supernet has a first address of 205.16.32.0 and a supernet mask of 255.255.248.0. A router receives three packets with the following destination addresses:

205.16.37.44
205.16.42.56
205.17.33.76

 - i) Which packet belongs to the supernet?
 - ii) How many blocks are in this supernet and what is the range of addresses?

⇔⇔⇔ **BH/K/TX** ⇔⇔⇔