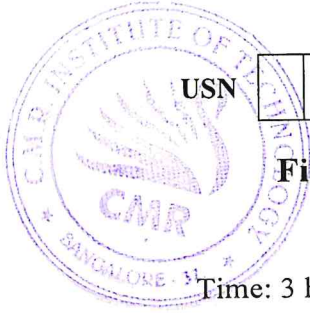


CBCS SCHEME



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18SCS151

First Semester M.Tech. Degree Examination, Dec.2019/Jan.2020 Advances in Computer Networks

Time: 3 hrs.

Max. Marks: 100

Note: Answer FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. With a neat diagram, describe the process of cost effective resource sharing. (06 Marks)
- b. Suppose a 128 Kbps point-to-point link is set up between Earth and a rover on Mars. The distance from Earth to Mars is approximately 55 Gm and data travels over the link at the speed of light (3×10^8 m/s).
 - i) Calculate the minimum RTT for the link
 - ii) Calculate the delay \times bandwidth product for the link
 - iii) A camera on the rover takes pictures of its surroundings and sends these to Earth. How quickly after a picture is taken can it reach Mission control on Earth? Assume that each image is 5MB in size. (06 Marks)
- c. With neat diagrams, describe stop and wait protocol. (08 Marks)

OR

- 2 a. What is the need of layering? Describe the TCP/IP architecture used for internet based applications. (06 Marks)
- b. With illustrative examples, explain sliding window algorithm along with its benefits and limitations. (08 Marks)
- c. Calculate the total time required to transfer a 1000kB file in the following cases, assuming a RTT of 100ms, a packet size of 1kB and an initial $2 \times$ RTT of "handshaking" before data is sent.
 - i) The bandwidth is 1.5Mbps, and data packet can be sent continuously
 - ii) The bandwidth is 1.5Mbps, but after we finish sending each data packet we must wait one RTT before sending the next.
 - iii) The bandwidth is "infinite" meaning that we take transmit time to be zero and upto 20 packet can be sent per RTT. (06 Marks)

Module-2

- 3 a. With neat diagrams and the routing tables describe the significance of virtual circuit switching in networks. (10 Marks)
- b. What is the need of DHCP? Explain the working of DHCP with suitable diagrams. (06 Marks)
- c. Describe the significance of bridges along with their limitations. (04 Marks)

OR

- 4 a. What is the need of spanning tree algorithm in networks? Describe its working by considering an example network. (10 Marks)
- b. With examples, explain the benefits of sub netting in the internetworking. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

- c. Using the example network given in Fig Q4(c) give the virtual circuit tables for all the switches after each of the following connection is established. Assume that the sequence of connections is cumulative that is, the first connection is still up when the second connection is established and so on. Also assume that the VCI assignment always picks the lowest unused VCI on each link, starting with 0
- Host D connects to Host H
 - Host B connects to Host G
 - Host F connects to Host A

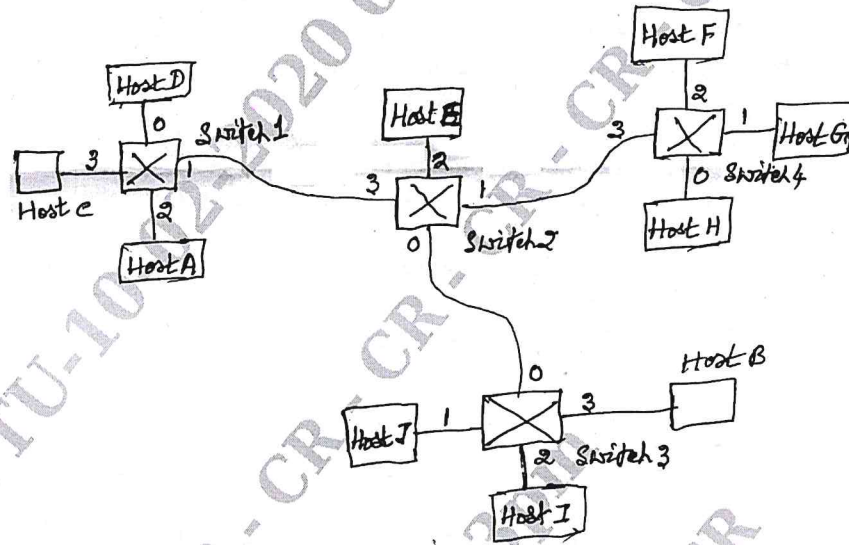


Fig Q4(c)

(06 Marks)

Module-3

- With an example network graph, describe the principle and the working of distance vector routing algorithm in networks. (10 Marks)
 - Describe the feature of IPV6 and header with a neat diagram. (10 Marks)

OR

- List and explain BGP characteristics and path attributes. (06 Marks)
 - Describe the various types of IP multicast. (08 Marks)
 - Write the forward routing table for the given network graph in Fig Q6(c) as it builds the routing database for the node A using link state algorithm

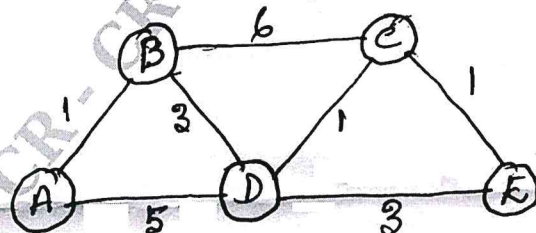


Fig Q6(c)

(06 Marks)

Module-4

- 7 a. Describe the process of TCP oriented reliable byte stream transfer with TCP header, connection establishment/termination and the way flow control has been implemented. (10 Marks)
- b. Explain the various types of queuing disciplines with respect to their working benefits and the limitations. (10 Marks)

OR

- 8 a. Explain the solutions to the silly window problem in TCP oriented network using the various algorithms. (10 Marks)
- b. Describe the following congestion control mechanism in practice : (10 Marks)
- i) Additive increase/multiplicative decrease
 - ii) Slow start.

Module-5

- 9 a. Describe the significance and working of Random Early Detection Congestion Avoidance mechanism. (10 Marks)
- b. Explain the following applications of network in practice : (10 Marks)
- i) Domain Name system
 - ii) World Wide web.

OR

- 10 a. Explain DEC bit and source based congestion avoidance mechanisms. (10 Marks)
- b. Describe the working of Electronic mail and network management in internetworking. (10 Marks)
