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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Second Semester, M.Tech - Computer Science and Engineering (MCSE)

Semester End Examination; May/June - 2018

Advanced Computer Networks

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

UNIT - I

1 a. Explain the requirements of a Network by three groups. 6

b. Describe cost effective way of resource sharing in networks. 10

c. Suppose a 128 kbps point-to-point link is set up between the 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 $3x10^8$ m/s.

i) Calculate the minimum RTT for the link

ii) Calculate the delay *X* bandwidth product for the link 4

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 5 MB in size.

2 a. Calculate the total time required to transfer a 1.5 MB file in the following cases : assuming an RTT of 80 ms, a packet size of 1 kB data, and initial 2 x RTT of hand shaking before data is sent.

i) The band width is 10 Mbps and data packets can be sent continuously

ii) The bandwidth is 10 Mbps but after we finish sending each data packet we must wait one RTT before sending the next 12

iii) The link allows infinitely fast transit but limits bandwidth such that only 20 packets can be send per RTT

iv) Zero transmit time as in (iii) but during the first RTT we can send one packet during the second RTT we can send two packets during the third we can send four (2^{3-1}) etc.

b. Illustrate with timeline diagram the four scenarios for the stop and wait protocol. 8

UNIT - II

3 a. Given the extended LAN shown in Fig. Q3(a) indicate which ports are not selected by the spanning tree algorithm. What are three informations present configuration message exchanged between bridges? Explain the steps involved to eliminate loops.

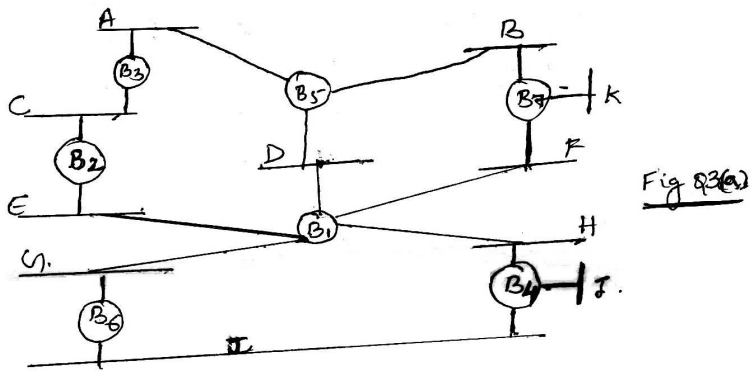

Fig Q3(a) 10

Contd…2

b. Explain the working of distance vector routing with a table. Write the initial distance stored at each node, initial routing table for node *C*, final table for node *C* and final distance stored at each node for the network shown in Fig. 3(b). 10

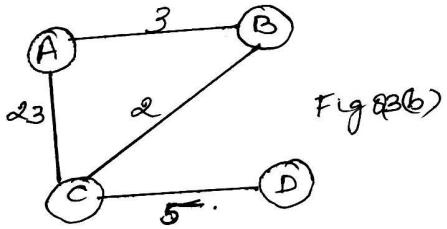

Fig 3(b)

4 a. Suppose a router has built up the routing table shown in table. The Router can deliver packets directly over interfaces 0 and 1, or it can forward packets to routers R_2, R_3 or R_4.

Assume the router does the longest prefix match. Describe what the router does with a packet addressed to each of the following destinations

i) 128.96.171.92 ii) 128.96.167.151 iii) 128.96.163.151 iv) 128.96.169.192

Subnet number	Subnet Mask	Next hop
128.96.170.0	255.255.254.0	Interface 0
128.96.168.0	255.255.254.0	Interface 1
128.96.166.0	255.255.254.0	R_2
128.96.164.0	255.255.252.0	R_3
Default		R_4

10

b. With a neat diagram, explain the working of DHCP protocols. 10

UNIT - III

5 a. Discuss IPV6 along with its Header format. 10

b. Write a note on MPLs. 10

6 a. Explain the working of Inter domain routing BGP. 10

b. Illustrate with a neat diagram, Mobile IP [Routing to mobile hosts]. 10

UNIT - IV

7 a. List the features of TCP protocol. Explain TCP header format. 10

b. Discuss Silly window syndrome. Describe how this syndrome can be avoid using Nagli's algorithm. Explain the working of Nagli's algorithm. 10

8 a. Illustrate with a neat diagram RPC (Remote Procedure Call). 10

b. How RTO is calculated using RTT? Explain different methods to calculate RTO in TCP. 10

UNIT - V

9 a. Discuss FIFO and Fair Queuing with neat diagrams. 10

b. Explain slow start phase under TCP cogestion control with neat diagram. Define fast retransmit and fast recovery. 10

10 a. Explain Random Early Detection (RED). Discuss the importance of minimum threshold and maximum threashold. 10

b. Discuss additive increase and multiplicative decrease of TCP congestion control with neat diagrams. 10

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