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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belgaum)
Second Semester, M. Tech - Computer Science and Engineering (MCSE)
Semester End Examination; June - 2016
### 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. Calculate the total time required to transfer a 1.5 MB file in the following case, assuming an RTT of 80 ms, a packet size of 1 KB data and on initial 2 x RTT of handshaking before data is sent :

i) The bandwidth 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. **10**

iii) The Link allows infinitely fast transmit, but limits bandwidth such that only 20 packets can be sent per RTT.

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

b. Suppose we want to transmit the message 1011001001001011 and protect it from errors using the CRC 8 polynomial,

$$x^8 + x^2 + x + 1.$$

i) Use polynomial long division to determine the message that should be transmitted. **10**

ii) Suppose the left most bit of the message is inverted due to noise on the transmission link. What is the result of the receiver's CRC calculation? How the receiver does know that an error has occurred?

2 a. What is API? Illustrate the steps involved in creating sockets on server side using TCP. **10**

b. Mention the two important factors used to measure the network performance. Define them. Explain how latency, propagation and transmit delay are measured? **10**

UNIT - II

3 a. What are the limitations of bridge? Explain them. **5**

b. Write datagram forwarding algorithm. **5**

c. For the network given below, give global distance vector tables,

(i) Each node knows only the distance to its immediate neighbors.

(ii) Each node has reported information it had in the preceding step to its immediate neighbors.

(iii) Step (ii) happens second time. **10**
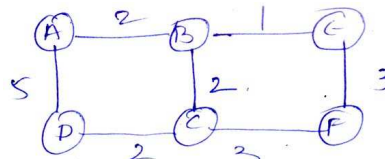
4 a. Illustrate with a neat diagram-process of relaying a message from a host to a remote DHCP server. 7

b. Write a note on ICMP. 3

c. Suppose a router has built up the routing table given below. The router can deliver packets directly over interfaces O and L, or it can forward packets to routers R_2, R_3, R_3 or R_4. Assume that 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   (v) 128. 96.165. 121   10

Subnet number	Subnet mask	Next hop
128.96.170.0	255.255.254.0	Interface O
128.96.168.0	255.255.254.0	Interface L
128.96 166.0	255.255.254.0	R_2
128.96.164.0	255.255.252.0	R_3
(default)		R_4

UNIT - III

5 a. What are the advantage of Multicast transmission compare to unicast and broad cast? Write a note on multicasting. Explain DVMRP with a suitable diagram of your own. 10

b. Explain with neat diagram mobile IP [Routing to mobile hosts]. 10

6 a. Describe IPV6, IPV6 header, IPV6 fragmentation extension header. 10

b. Explain PIM-SM and PIM-DM with neat diagram. 10

UNIT - IV

7 a. Write a note on silly window syndrome and Nagle's Algorithm. 10

b. Demonstrate with a neat diagram the connection establishment phase and Termination phase in TCP. 10

8 a. Explain RPC with necessary diagram. What are two important functions performed by RPC protocol? How RPC overcome network limitations? 15

b. What are the three main functions of RTCP control stream? 5

UNIT - V

9 a. Explain the following :

(i) Reservation based Versus feedback based   (ii) Window based versus Rate based. 10

b. How network fairly and effectively allocates the resource? Explain. 10

10 a. Explain in TCP :

(i) Slow start-phase   (ii) Congestion Avoidance phase   (iii) Congestion detection phase. 15

b. Write a note on Decbit. 5

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