[Total No. of Questions - 8] [Total No. of Printed Pages - 3] (2125)

15408

M. Tech 3rd Semester Examination

Computer Communication Networks (NS)

EC-303

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt any five questions.

1. (a) Produce a diagram of the OSI seven layered model that clearly shows how data is transferred through the model's layers and that also illustrates what is meant by the term peer to peer protocol. (10)

   (b) Discuss Shannon's capacity. What implications does it have? Give suitable example. (10)

2. (a) Describe Time Division Multiplexing, Frequency Division Multiplexing and Statistical Multiplexing. Use diagrams. (10)

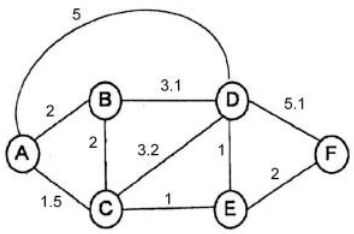
   (b) Why port addressing is needed? Describe how data link layer and transport layer differ from each other with respect to error handling, connection establishment and flow control. (10)

3. (a) Compare Go-back-to-N ARQ and Selective Repeat ARQ when the second frame is lost during the transmission from Sender to Receiver with a sliding window of size 8. (10)

   (b) Sixteen stations, numbered 1 through 16, are contending for the use of a shared channel by using the adaptive tree walk protocol. If stations 2, 3, 5, 9, 12, 14 suddenly become ready at once, how many bit slots are needed to resolve the contention. (10)

[P.T.O.]

4. (a) For the six node network topology given below with link costs as shown, find the shortest path from node D to node A using Dijkstra's algorithm. Clearly state the order of nodes as they are added one-by-one by the algorithm and give the path cost from node D to the added node. If there is more than one way (or order) of adding links, given all possible ways (or orderings). (10)



   (b) The purpose of a routing algorithm is to find the least cost path from source to destination. What are some of the possible cost metrics (list at least five)? Identify which metrics are static and which are dynamic. (10)

5. (a) What are the fundamental services provided by the transport layer? How does TCP implement each of these services. (10)

   (b) What is a SYN attack? Describe what the attack is and how it works to deny service in a server. (10)

6. (a) How does TCP detect congestion and how does it respond to it? (10)

   (b) Explain Three-Way Handshake Mechanism used by TCP to terminate a Session reliably. (10)

7. (a) Show by means of a diagram the cell format used within an Asynchronous Transfer Mode (ATM) network. Clearly show on this diagram how many bits are assigned to each field. (10)

   (b) Write a note on DNS and explain its working. (10)

8. (a) Write short note on the following:

   (i) ATM over IP

   (ii) Broadband ISDN

   (iii) AES

   (iv) Wireless networks. (10)

   (b) What are the steps involved in authentication? What is the role of third party and certifying authorities? (10)