Institute of Informatics & Communication (UDSC)

M.Sc. (Informatics), Semester-III Examination, December 2018

Network Architecture – IT31

Time: 3 hrs. MM: 75

Answer any five questions. Question 1 is compulsory. Please write your roll number on the top of this paper.

Q.1. i. What is the principal difference between connectionless communication and connection-oriented communication? 15

ii. How could you eliminate the multiple-access problem for your Local-Area Network? What is the flow control problem?

iii. What are two reasons using layered protocols?

iv. What are Ethernet and IEEE 802.3?

v. What are the communications protocol and what communication protocol must define?

Q.2. Describe the following 15

i. Token ring, ii. 10Base5, iii. 10BaseFX, iv. 10Base 2, v. FDDI

Write down the characteristics of each one of them based on the following parameters Signaling Method, Media, Maximum Throughput, Maximum Segment length.

Q.3. Compare 12 nodes connected in three ways: 15

A single 10 Mb/sec coaxial cable, a switch connected via twisted pairs, each running at 10 Mbit/sec., and a switch connected via optical fibers, each running at 100 Mbit/sec. The single coax is 500 meter long and the average length of each segment to a switch is 50 meters. Considering the three topologies viz. Star, Bus and Mesh and the cost of each alternative considering design issues. Design the network using above mentioned criterion and calculate the total cost of the individual network.

The cost for labour, node interface , media, termination are as follows:

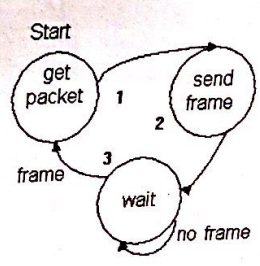
$Labour_{coax}$= 100/- $Node_{coax}$= 500/- $Media_{coax}$= 100/- $Termination_{coax}$= 150/-

$Labour_{twist}$= 50/- $Node_{twist}$= 250/- $Media_{twist}$= 100/- $Termination_{twist}$= 7500/-

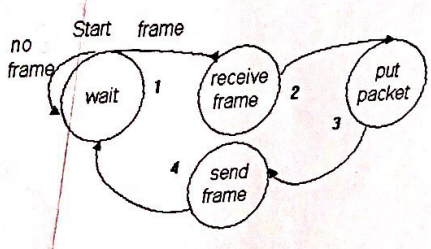
$Labour_{fiber}$= 200/- $Node_{fiber}$= 100000/- $Media_{fiber}$= 700/- $Termination_{fiber}$= 3000/-

Q.4. Write a algorithm along with a suitable programme, using the diagram below, starting at 1 for each list the sender and receiver state numbers that would be entered given that: 15

- the sender sends two frames,
- the first is acknowledged successfully,
- the acknowledgment to the second frame is lost.



Sender



Receiver

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Q.5. a. Explain TCP/IP model. Protocols used in respective layers with their functionalities. Compare this stack with OSI model. 10

b. 5

i. In what layer of the OSI model is the data received from the Network layer and divided into distinct frames, which can then be transmitted by the Physical layer?

ii. Encryption takes place at which layer?

iii. Which layer establishes, maintains, and terminates communications between applications located on different devices?

iv. Which OSI layer defines the standards for cabling and connection?

v. Which layer handles the formatting of application data so that it will be readable by the destination system?

Q.6. a. Explain the following and discuss their functionalities and fundamental differences: 15

i. Router

ii. Switch

iii. Access Point

iv. Bridge

v. Repeater