Institute of Informatics & Communication

M.Sc. (Informatics), Semester-III Examination, 2016

Network Architecture – IT31

Time: 3 hrs. MM: 75

Answer any five questions.

Q.1 15

a. How could you eliminate the multiple-access problem?
b. What is the flow control problem?
c. What are two reasons using layered protocols?
d. What is Ethernet and IEEE 802.3.
e. What are the communications protocol and what communication protocol must define?

Q.2 15

(I) You are sending a bottle of fine tap water from New Delhi to a friend in Noida.

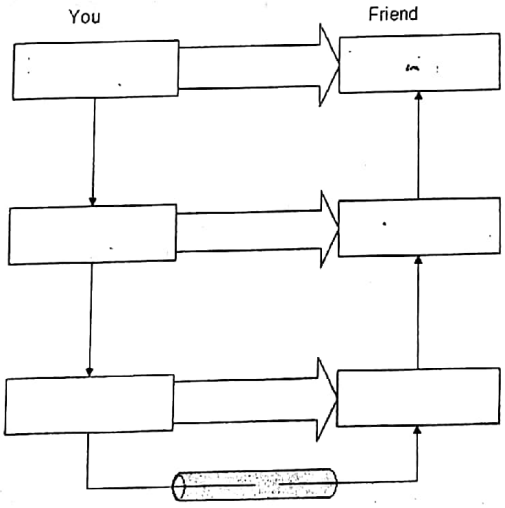
a) Complete the following diagram by labeling the rectangles and large arrows using the listed item letters to show how peers at each horizontal level view the bottle delivery process. You and friend rectangles have been completed.

i) friend's mailbox
ii) transportation
iii) your mailbox
iv) Noida post office
v) New Delhi post office
vi) bottle
vii) package
viii) DND expressway

(II) Label the following arrows and rectangles using the listed item letters.

i) Application layer
ii) Physical layer
iii) Transport layer
iv) Application Protocol
v) Physical Protocol
vi) Transport Protocol

(III) Add the labels *virtual* and *real* to the diagram arrows to indicate the type of communication path.



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.

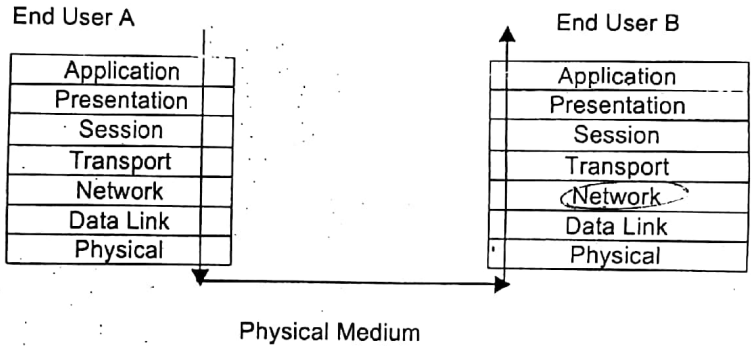
The cost for labour, node interface , media, termination are as follows:

$Labour_{coax}$= 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 Consider the UDSC network and the various services provided this network. Draw a schematic of the network and discuss the various protocols used by this network at various level. Also Discuss the bottleneck(s) of this network if any, if yes, discuss and explain, also suggest to remove the bottleneck by giving an appropriate design. 15

Q.5 What is defined by the Network topology? Why do we have different topologies, give your justification with examples including schematic design. How does the logical topology differ from the physical topology? Why can a single physical topology support multiple logical topologies? 15

Q.6 15



Above figure shows information moving down from the uppermost layers to the lower layers. To carry out this function write an algorithm to transmit data (packet) from user A to user B. Also, discuss the role of higher layers and lower layers.