NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI-15

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

V SEMESTER B.TECH, REASSESSMENT EXAMINATION

CSPC53 COMPUTER NETWORKS

DATE: 12/02/2024 **Answer All Questions** **MAX. MARKS: 100**

QUESTION-I (4x5=20marks)

a. What are the various layers in the OSI Model? Explain about the layers which are defined by hardware and software?

b. Draw a hybrid topology encompassing at least 2 types of topologies. Explain how combining the two topologies helps overcome the disadvantages of the other.

c. What is the need of error control in 2 different layers? How they are accomplished?

d. Differentiate between the OSI Model and TCP/IP Model.

e. While chatting in whatsapp, is the mode of communication half-duplex or full-duplex? Justify.

QUESTION-II (4x5=20marks)

a. What does 'piggybacking' mean? Where it is used?

b. Draw a simple user datagram packet, showing size of each part in bits.

c. How does 'cumulative acknowledgement' work?

d. What are line codes? Show any one type of line code with your own example.

e. What is the role of the physical layer?

QUESTION-III (4x5=20marks)

a. How can we detect single bit errors while transmitting data? Is it possible to correct it?

b. What are the constrains on window size for: (a) Go-Back-N (b) Selective-Repeat?

c. How does the slotted ALOHA protocol solve the problem faced in the ALOHA protocol?

d. What are the various types of persistence methods used in multiple access protocols?

e. How does binary countdown work if stations numbered 8, 12 and 14 want to transmit data simultaneously?

QUESTION-IV (4x5=20marks)

a. In which classes are 'subnetting' and 'supernetting' needed? Explain.

b. How is a multi-stage switch more efficient in comparision to a single-stage switch?

c. List out the pros and cons of using a spanning tree for broadcast.

d. What is 'network address' and 'broadcast address' in IP Addressing?

e. What is the 'count to infinity' problem? How do you resolve it?

QUESTION-V (4x5=20marks)

a. Using the transposition technique, encrypt the text COMPUTERNETWORKS using the key 4312.

b. How many keys are required for encryption in: (a) symmetric cryptographic techniques (b) assymmetric cryptographic techniques? Give small description.

c. What are the 'delete' and 'keep' modes in emails?

d. Draw the architecture diagram of the following scenario: Server and its mail server are in the same network, and it uses a web server. The destination and its mail server are in different networks, but uses normal server.

e. Expand and explain their functionalities: - 'FTP', 'IMAP', 'MTA', 'MAA'.