53 (CS 402) CPNW

2019

COMPUTER NETWORKS

Paper : CS 402

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions out of **seven**.*

1. *(a)* Discuss in brief, the various layers of the TCP/IP protocol suite. 8

   (b) Write notes on — star topology and mesh topology. 3+3=6

   (c) Define the following : 3×2=6

   (i) Switch

   (ii) Bridge

   (iii) Router.

2. *(a)* Differentiate between flow control and error control. 2+2=4

(b) List out the steps involved in Internet checksum method of error detection. 6

(c) Explain in brief, the working principle of *any two* link layer protocols for communication over noisy channels. 5×2=10

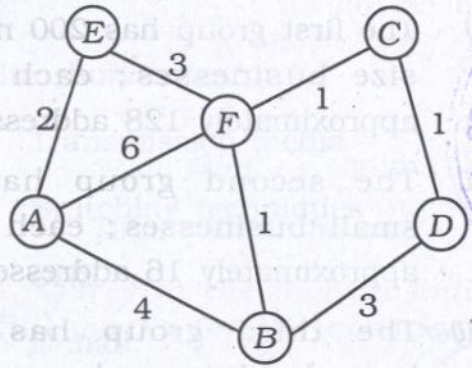
3. *(a)* Write down the basic functionality of the media access control layer. 2

(b) What do you mean by collision? How does CSMA/CD detect and handle collision? 2+6=8

(c) Discuss CDMA with the help of an example. 10

4. *(a)* State the differences between static routing and dynamic routing. Explain Dijkstra's routing algorithm with the help of an example. 3+5=8

(b) Consider the following system where nodes are representing routers and edges are representing links between them. 9



Use distance vector routing to create the routing tables for the different routers. Show each step explicitly.

(c) What are the advantages of link-state routing over distance-vector routing? 3

5. *(a)* Differentiate between classful addressing and classless addressing technique. 3

(b) What do you mean by subnetting? 3

(c) An ISP is granted a block of addresses starting with 150.80.0.0/16. The ISP wants to distribute these blocks to 2600 customers as follows :

(i) The first group has 200 medium size businesses ; each needs approximately 128 addresses.

(ii) The second group has 400 small businesses ; each needs approximately 16 addresses.

(iii) The third group has 2000 households ; each needs 4 addresses.

Design the subblocks and give the slash notation for each subblock. Find out how many addresses are still available after these allocations. 12+2=14

6. (a) Describe how connection establishment is done in TCP by the help of a 3-way handshaking mechanism. 6

(b) What do you mean by multiplexing and demultiplexing ? 4

(c) Compare : 5×2=10

(i) TCP *vs* UDP

(ii) Client-Server *vs* Peer-to-Peer Networks.

7. Write short notes on : 4×5=20

(i) Transmission media

(ii) Switching techniques

(iii) DNS

(iv) E-mail.