

**Fifth Semester B. E. (Computer Science and Engineering)
Examination**

COMPUTER NETWORKS

Time : 3 Hours]

[Max. Marks : 60

Instructions to Candidates :—

- (1) All questions carry marks as indicated.
- (2) Assume suitable data and illustrate answers with neat sketches wherever necessary.

1. (a) How computer networks can be classified on the basis of scale and transmission technology ? 5 (CO 1)
- (b) List the ways in which OSI and TCP/IP models are same. List the ways in which they differ. 5 (CO 1)

2. Solve any Two :—

- (a) What is cladding ? Discuss in detail five basic important categories of fiber optics. 5 (CO 2)

- (b) Discuss Terrestrial Microwaves with respect to following points :—
- (i) Physical description.
 - (ii) Applications.
 - (iii) Transmission Characteristics. 5 (CO 2)

- (c) Why must a satellite have distinct uplink and downlink frequencies ? Also discuss the functions performed by an Antenna. 5 (CO 2)

3. Solve any Two :—

- (a) How does a simplex protocol behave when we drop the assumption that the communication channel is error free ? Write the protocol. 5 (CO 3)

- (b) What is the significance of hamming distance ? How to calculate hamming distance of a code ? If the message received by a receiver is 110011100001111 with even parity using hamming distance algorithm, check whether there is error or not ? 5 (CO 3)
- (c) Discuss the services provided by data link layer to network layer in detail with examples. Why providing acknowledgements at data link layer is an optimization rather than a requirement ? 5 (CO 3)
4. (a) What are the responsibilities of a monitor in a Token ring ? How the Token ring is logically maintained ? 5 (CO 3)
- (b) We have five sources, each creating 400 characters per second. If the interleaved unit is a character and 1 synchronizing bit is added to each frame then find :
- (i) Data rate of each source.
 - (ii) The duration of each character in each source.
 - (iii) The duration of each frame.
 - (iv) The number of bits in each frame.
 - (v) The data rate of the link. 5 (CO 3)
5. (a) Differentiate between virtual circuits and datagrams. 5 (CO 3)
- (b) Solve any **One** :—
- (i) For hierarchical routing with 4800 routers, what is the number of region and clusters should be chosen to minimize the size of routing table ? Why hierarchical routing is preferred ? 5 (CO 4)
 - (ii) A computer on a 15 Mbps network is regulated by the token bucket. The token bucket is filled at the rate of 1.5 Mbps. It is initially filled to capacity with 8 megabits. How long can the computer transmit at the full 10 Mbps ?
Also discuss the working of token bucket algorithm. 5 (CO 4)

6. (a) Suppose that the TCP congestion window is set to 20 K bytes and a timeout occurs. How big will the window be if the next four transmission bursts are all successful ? Assume that the maximum segment size is 1 KB. How does Internet congestion control algorithm works ? 5 (CO 3)
- (b) How connection establishment takes place in Transport layer ? 5 (CO 3)