Course Code : CST 317 / CST 305 **JSRK/MW – 17 / 2057**

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) In what way the TCP / IP and OSI models are same ? In what way they are different ? 5(CO 1)

   (b) Justify the need of a protocol hierarchy. Discuss its real life and technical example. 5(CO 1)

2. Solve any **Two** :—

   (a) What are the advantages and disadvantages of optical fiber over twisted pair and coaxial cable ? 5(CO 2)

   (b) Why are the wires twisted in twisted – pair copper wire ? What are some major limitations of twisted – pair wire ? What is the difference between unshielded twisted pair and shielded twisted pair ? 5(CO 2)

   (c) Explain Terrestrial Microwaves with respect to following points :—

      (i) Physical description

      (ii) Applications

      (iii) Transmission Characteristics. 5(CO 2)

3. Solve any **Two** :—

   (a) Compute the minimum size of the sending window if sliding – window ARQ is to be used with a transmission efficiency of 100% under error – free

conditions. Assume that the user data frame size is 1250 bytes, link rate is 1 Mbps and round – trip propagation delay is 10 ms. Ignore ACK frame size, header / CRC overhead and processing delays. Also discuss ARQ / PAR protocol. 5(CO 4)

(b) How does the system behave when one of the sender starts first in one bit sliding window protocol ? Also write the protocol. 5(CO 3)

(c) If the code received on receiver is 110011010001000 with odd parity, verify whether is any error in the data received using hamming distance error correction algorithm. Also discuss the CRC algorithm for error detection. 5(CO 4)

4. Solve any **Two** :—

(a) A network using CSMA / CD has a bandwidth of 10 Mbps. If the maximum propagation time (including delays in the devices and ignoring the time needed to send a jamming signal) is 25.6 μs. What is the minimum size of the frame ? Discuss the frame format of IEEE 802.3. 5(CO 4)

(b) How fairness property is achieved in a Token ring ? Elaborate the logical ring maintenance in IEEE 802.5 Token Ring. 5(CO 3)

(c) Differentiate between pure and slotted ALOHA with and an example and discuss their throughputs. 5(CO 3)

5. (a) List the disadvantages of Distance vector routing algorithm. Describe the steps in link state routing algorithm. 5(CO 3)

(b) Solve any **One** :—

(i) What is a choke packet ? Why it is needed ? Also discuss hop by hop choke packets. 5(CO 3)

(ii) A leaky bucket is at the host network interface. The data rate on the network is 2 MByte / s and the data rate on the link from the host to the bucket is 2.5 Mbyte / s.

(a) Suppose the host has 250 Mbytes to send onto the netowrk and it sends the data in a burst. What should be the minimum capacity of the bucket (in bytes) in order that no data is lost ?

(b) Suppose the capacity of the bucket is 100 M bytes. What is the longest burst time from the host in order that no data is lost ? 5(CO 4)

6. Solve any **Two** :—

(a) Discuss the procedure for establishing a transport connection. Sketch all the possible scenarios. 5(CO 3)

(b) How does round trip time is calculated in TCP ? If TCP RTT is currently 37 milliseconds and the acknowledgements come after 22, 56, 5 milliseconds what is the new RTT ? Use a = 0.8. 5(CO 4)

(c) How does Transport layer handles crash recovery ? 5(CO 3)