MID-SEMESTER EXAMINATION-2020

Subject Code: IT-3001
Subject name: Computer Network
Semester: 6th Semester, B.Tech.

Full Marks: 20 **Time: 1.5 Hours**

Four questions are to be attempted including question 1 which is compulsory.

1. (1 Mark*5)

(a) Consider an HTTP client that wants to retrieve a Web document at a given URL. The IP address of the HTTP server is initially unknown. What transport and application-layer protocols besides HTTP are needed in this scenario?

(b) "There are applications where using UDP is better than to use TCP". True or false, Justify your answer.

(c) If the value of HLEN field is 1111, how many bytes of options are included in the TCP segment?

(d) Consider a TCP client and a TCP server running on two different machines. After completing data transfer, the TCP client calls close to terminate the connection and a FIN segment is sent to the TCP server. Server-side TCP responds by sending an ACK which is received by the client-side TCP. As per the TCP connections state diagram, in which state does the client-side TCP connection wait for the FIN from the sever-side TCP?

(e) Can a machine with a single DNS Name have multiple IP Address? How could this occur?

2. (a) Consider a long-lived TCP session with an end-to-end bandwidth of 1 Gbps. The session starts with a sequence number of 1234. Find the minimum time (in seconds, rounded to the closet integer) before this sequence number can be used again. (3 marks)

(b) Discuss the importance of having layer structure in TCP/IP and describe the functionality of each layer in TCP/IP stack. (2 marks)

3.(a) The values of parameters for the Stop-and–Wait ARQ protocol are as given below:

Bit rate of the transmission channel = 1Mbps, Propagation delay from sender to receiver = 0.75 ms, Time to process a packet = 0.25ms, Number of bytes in the information packet =1980, Number of bytes in the acknowledgment packet = 20, Assume that there are no transmission errors. What is the transmission efficiency (expressed in percentage) of the Stop-and–Wait ARQ protocol. (3 marks)

(b)"The maximum send window for selective repeat protocol is 2^{m-1}". True or false, Justify your answer with suitable example. (2 marks)

4.(a) In a network using the Go-Back-N protocol with m = 3, the values of variables are $S_f = 62$, $S_n = 66$, and $R_n = 64$. Assume that the network does not duplicate or reorder the packets. Draw the flow diagram of the above scenario and find out the below answers with the help of the diagram.

a. What are the sequence numbers of data packets in transit?
b. What are the acknowledgment numbers of ACK packets in transit?

(b) Describe the various types of delays involved during transmission a packet in a computer network. Also explain what do you mean by End-to-End delay. (2 marks)

5-(a) Mention the important records maintained by various DNS servers and describe the functionality of each of these records. State the type of records maintained by authorative and non-authorative DNS servers along with the reason for the same. (3 Marks)

(b) In FTP, which entity (client or server) starts (actively opens) the control connection? Which entity starts (actively opens) the data transfer connection? If the client needs to retrieve one file from the server site and store another file on the server site, how many control connections and how many data transfer connections are needed? (2 marks)

********ALL THE BEST********