Semester: 5th
Subject Name:- CN & Code:- CS 30003
Branch (s): - CSE, IT, CSCE & CSSE

AUTUMN MID SEMESTER EXAMINATION-2024

School of Computer Engineering
Kalinga Institute of Industrial Technology, Deemed to be University
Subject Name: Computer Networks
[CS 30003]

Time: 1 1/2 Hours **Full Mark: 20**

Answer Any four questions including question No.1 which is compulsory.
The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable and all parts of a question should be answered at one place only.

1. Answer all the questions. [1 Mark X 5]

a) What is the main difference between a Fully Qualified Domain Name (FQDN) and a Partially Qualified Domain Name (PQDN)? CNAME record are used for which purpose.

b) The following is the contents of a UDP header in hexadecimal format.
0045 DF00 0058 0000
Calculate the destination port number and source port number? What is the length of the data? Has the sender calculated a checksum for this packet.

c) In Stop and wait protocol every 4th packet is lost and we need to send total 15(fifteen) packets so how many transmission it took to send all the packets?

d) Assume there is a server with the domain name www.kiit.ac.in.

Write the HTTP request that needs to retrieve the document **/usr/users/doc**. The client accepts MIME version 1, GIF or JPEG images.

e) In TCP, how many sequence numbers are consumed by each of the following segments?
(i) SYN (ii) ACK (iii) SYN+ACK (iv) Data

2.(a) A client's browser sends an HTTP request to a website. The website responds with a handshake and sets up a TCP connection. The connection setup takes 8.4 mili seconds(ms), including the RTT. The browser then sends the request for the website's index file. The index file references 22(twenty two) additional images, which are to be requested/downloaded by the client's browser.

Assuming all other conditions are equal, how much longer would non-persistence HTTP take than persistence HTTP. [2.5 Marks]

2.(b) Describe the following terms related to Eletronic mail applications. [2.5 Marks]

(i) Eletronics mail architecture.

(ii) Mail Transfer Phases,

(iii) Message access agent,

(iv) Multipurpose Internet mail extension

3.(a) State how to compute different types of delays in packet data network. Which of these delays are constant and which are variable?

Calculate the total time required to transfer a 1.5MB file based on following information.
The bandwidth is 10Mbps, but after we finish sending each data packet we must wait one RTT before sending the next.
Assuming a RTT of 80 ms, a packet size of 1 KB data, and an initial 2×RTT of "handshaking" before data is sent. [2. 5 Marks]

3(b) Draw the TCP header format with the help of a diagram. Explain briefly each fileld. [2.5 Marks]

4.(a) Derive the realationship between window size and sequence number in Go Back N(GBN) and Seletive Repeat (SR) flow control protocol.

By considering sequence number as three bit. Calculate the window size for both GBN and SR. With a neat diagram show how it will affect if the window is made larger than the calculated value for both GBN and SR. [2. 5 Marks]

4.(b) Sender A needs to send a message consisting of nine (9) packets to Receiver B using a siding window (window size 3) and Go-Back-N (GBN) strategy. All packets are ready and immediately available for transmission. If every 5th packet that A transmits gets lost(but no acks from B ever get lost), then what is the number of packets that A will transmit for sending the message to B? [2.5 Marks]

5.(a) In a TCP connection, the initial sequence number is 2171. The clients open the connection, sends three segments, second of which carries 1000 bytes of data and closes connections. What is the values of the sequence in each of the following segments sent by clients? [2.5 Marks]

(i) SYN segment

(ii) Data Segment

(iii) FIN segment

5. (b) Briefly mention different TCP states and draw TCP state transition diagram. [2.5 Marks]

*** Best of Luck ***