AUTUMN RE-MID SEMESTER EXAMINATION-2023

School of Computer Engineering
Kalinga Institute of Industrial Technology, Deemed to be University
Computer Network
[IT-3005]

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

Answer any four Questions including Q.No.1 which is Compulsory.
The figures in the margin indicate full marks. Candidates are required to give theiranswers in their own words as far as practicable and all parts of a question should beanswered at one place only.

1. Answer all the questions. [1 x 5]

   a) The sender wants to send data, where the receiver's advertisement window size is 8KB, MSS = 1KB with cwnd = 1MSS. After how many RTT the sender will be able to send maximum window size.

   b) Why do HTTP and SMTP protocols runs on the top of TCP rather than on UDP?

   c) In our reliable data transfer protocol (rdt), why did we need to introduce sequence numbers?

   d) Assume that a system uses five protocol layers. If the application program creates a message of 100 bytes and each layer (including fifth and first) add a header of 10 bytes to the data unit, what is the efficiency of the system?

   e) HTTP protocol is stateful or stateless in nature?

2. [2.5+2.5]

a) Describe the E-mail architecture in detail. Explain why SMTP cannot be used at the receiver end for receiving the E-mail.

b) If m number of bits are used for representing a sequence number in selective repeat ARQ, then the maximum size of sliding window is 2^{m-1} . Justify this statement using a boundary case example. What will happen if the size of sliding window exceeds 2^{m-1}?

3. [2.5+2.5]

a) Show the difference between recursive and iterative resolution for the domain name given (www.coursera.com).

b) Illustrate and explain the TCP State transition diagram. Write down the significance of TIME_WAIT state and 2MSL timeout.

4. [2.5+2.5]

a) What is the difference between centralized P2P network and decentralized P2P network?

b) In the Stop-and-Wait protocol, show the case in which the receiver receives a duplicate packet (which is also out of order). What is the reaction of the receiver to this event?

5. [5]

The following is a dump (contents) of a UDP header in hexadecimal format: 0045DF0000580000

a. What is the source port number?

b. b. What is the destination port number?

c. What is the total length of the user datagram?

d. d. Is the packet directed from a client to a server or vice versa?

e. What is the application-layer protocol?

*** Best of Luck ***