AUTUMN MID SEMESTER EXAMINATION-2018

School of Computer Engineering

KALINGA INSTITUTE OF INDUSTRIAL TECHNOLOGY

DEEMED TO BE UNIVERSITY, BHUBANESWAR-24

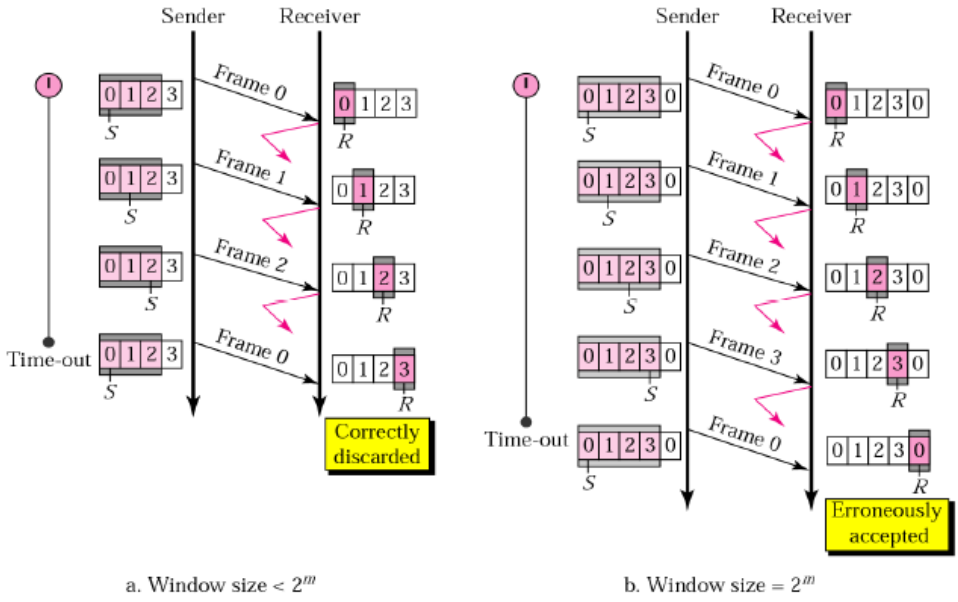
COMPUTER NETWORK

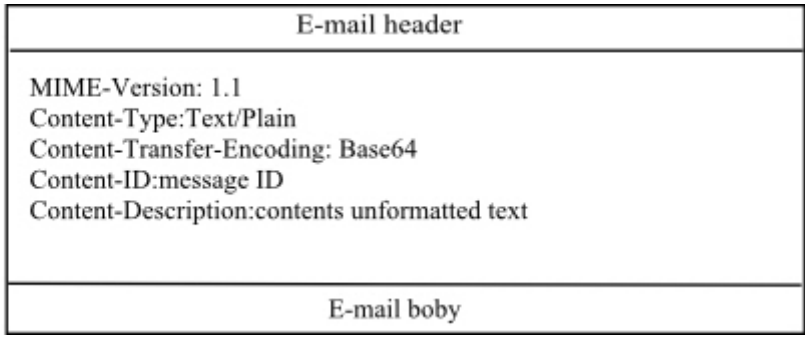
[IT-3001]

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

Answer any five 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.

Q 1.	a. With nonpersistent connection between browser and origin server, is it possible for a single TCP segment to carry two distinct HTTP request message? Explain your answer. ANS: Not possible. In nonpersistent connection a single TCP connection can carry only one HTTP request by definition. b. Why do HTTP, FTP and SMTP protocols runs on the top of TCP rather than on UDP? ANS: TCP provides all application data be received in the correct order and without gaps, but UDP does not. c. What would be the type for the Resource Record (RR) that contains the host-name of the mail server? ANS: Type=MX d. Is it possible for an application to enjoy reliable data transfer even when the application runs over UDP? If so how? (Be brief in your answer) ANS: some applications do not need the reliable data transfer provided by TCP. If these applications require reliable data transfer, then the application layer protocol will have to provide for reliability. e. In our reliable data transfer protocol (rdt), why did we need to introduce sequence numbers? ANS: Sequence numbers are required for a receiver to find out whether an arriving packet contains new data or is a retransmission.	[5×1]
Q2.	a. Consider sending a packet from a source host to a destination host over a fixed route. List and explain the delay components in the end-to-end delay.	[3]

	Which of this delays are constant and which are variable? ANS: List and explain the delay components in the end-to-end delay [2] Which of this delays are constant and which are variable [1] b. Explain why the size of the sender window must be less than 2^m for Go-Back-N ARQ. ANS:  a. Window size < 2^m b. Window size = 2^m	[2]
Q3.	a. Suppose Alice, with a web-based e-mail account send a message to Bob, who accesses his mail from his mail server using POP3. Discuss how the message gets from Alice's host to Bob's host. ANS: Message is sent from Alice's host to her mail server over HTTP. Alice's mail server then sends the message to Bob's mail server over SMTP. Bob then transfers the message from his mail server to his host of POP3. With POP3 there are two options "download and delete" mode where you cannot re- read email if you change the client. The second option is "Download-and-keep" mode, where copies of messages on different clients. b. In SMTP, a sender sends unformatted text. Write and explain the MIME header for his message. ANS:	[3] [2]

	MIME headers  	
Q4.	a. The distance from earth to a distant planet is approximately 9×10^{10} m. What is the channel utilization if a stop-and-wait protocol is used for frame transmission on a 64 Mbps point-to-point link? Assume that the frame size is 32 KB and the speed of light is 3×10^{8} m/s. ANS: Distance = 9×10^{10} m Datarate = 64 Mbps Size = 32 KByte = 256 Kbits Propagation Speed = 3×10^{8} m/s Transmission Delay = Packet Size / Datarate = 256 Kb/ 64 Mbps = 4 ms = 0.004 s Propagation Delay = Distance / Propagation Speed = 9×10^{10} / 3×10^{8} = 300 s Assuming no processing delay on receiver and ack size is negligible, only one packet is sent in RTT ie 600 s Utilization = 0.004 / (0.004 + 600) = 6×10^{-6} b. What is the difference between centralized P2P network and de centralized P2P network? ANS: Centralized P2P systems use a centralized index for the files shared by each peer. It simplifies the direct exchange and the sharing of files between peers. • However, it represents a single point of failure which reduces the reliability of the system. In completely decentralized P2P systems, a central authority for storing data and handling all the queries is not available. • Interconnected peers are able to participate in transactions by interacting with each other and make local autonomous decisions to achieve their objectives. Peers are responsible for storing, sharing information and handling the queries. • Peers act as clients and request services from other peers as well as servers and provide services to other peers. These systems provide improved robustness and enhanced scalability compared to centralized systems. • The fundamental difference between the two approaches is that one prioritizes robustness, while the other prioritizes efficiency. • A decentralized index approach tends to be more robust (no single point of failure), but it is usually tricky to make it as efficient as a	[3] [2]

	centralized approach. In terms of scalability, decentralized approaches have a bigger potential, but it is not trivial to ensure that a given decentralized system actually scales well from both a theoretical and a practical point of view.	
Q5.	Write short note on any two. a. Conditional-GET b. Connection establishment of TCP protocol. c. TCP Congestion Control.	[2.5 + 2.5]

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