Roll No. _____

Pandit Deendayal Petroleum University

Take Home Assignment
B. Tech. (CSE/ICT)
Semester - IV

Date:12/06/2020

Course Name : Computer Network
Course Code : 17CP213T **Max. Marks:50**

Instructions:

1. Submit hand written assignment on foolscap A4 size pages.
2. Write your name, roll no., subject name and code at top of the assignment.
3. Assume suitable data wherever essential and mention it clearly.
4. Writing appropriate units, nomenclature, and drawing neat sketches/schematics wherever required is an integral part of the answer.

Part-A
ANSWER ALL QUESTIONS (5 x 4 Marks = 20 Marks)

Question No.	Description	Marks	Course Outcome (CO)
Que-1	In client-server communication, why server always respond (i.e. httpResponse) to user in HTML format?	04	CO3
Que-2	As we know that Additive Increase and Multiplicative Decrease (AIMD) is used in TCP for congestion control. A few other policies are Additive Increase and Additive Decrease (AIAD), Multiplicative Increase and Additive Decrease (MIAD), Multiplicative Increase and Multiplicative Decrease (MIMD). Discuss these three policies in terms of Convergence and Stability.	04	CO5
Que-3	Explain the functioning of Domain Name System (DNS) with example. Clearly state the role of Local DNS server, Top level domain (TLD) name server, and authoritative server.	04	CO3
Que-4	Calculate the effective throughput for transferring a 1000kb file assuming TCP using slow start congestion control technique. Given the round trip time 100 ms, and maximum segment size is 1460bytes. Assume there are no losses and both the bandwidth and the receiver window size is infinite.	04	CO5
Que-5	Suppose you walk into a room, connect to Ethernet, and want to download a webpage. What are all the protocol steps that take place, starting from powering on your PC/Laptop to getting the Web page? Assume there is nothing in our DNS or browser cache when you power on your PC/Laptop. (Hint: the steps include the use of Ethernet, DHCP, ARP, DNS, TCP, and HTTP protocols.) Explicitly indicate in your steps how you obtain the IP and MAC addresses of a gateway router.	04	CO6

Part-B
ANSWER ALL QUESTIONS (3 x 10 Marks = 30 Marks)

Que-1	A Sender has to send 128 KB of data to the receiver. Let the size of congestion window of a TCP connection be 64 KB when a timeout occurs and the size of congestion window of a TCP connection be 32 KB when 3-duplicate acknowledgement occurs. The round trip time of the connection is	10	CO5

	100 msec and the maximum segment size used is 2 KB. How much time (in msec) does TCP connection will take to get back to 64 KB congestion window.		
Que-2	Suppose a router receives an IP packet containing 800 data bytes and has to forward the packet to a network with maximum transmission unit (MTU) of 300 bytes. Further, one of the fragment need to forward to a network with maximum transmission unit (MTU) of 150 bytes. Assume that IP header length (HLEN) is 8. Show the fragments that the router creates and specify the relevant values (such as Offset, MF, Total length, Header length) in each fragment header.	10	CO4
Que-3	If the TCP round-trip time (RTT) is currently 37 msec and the following acknowledgements come in after 33, 39, 24, 47, 35 msec, respectively. What is the new RTT estimate? Use alpha (α) = 0.6. Also calculate the problem by using Jacobson's algorithm. Assume initial deviation as 4 just before the first of these five samples was obtained and Beta (β) = 0.25. Where, α and β are smoothing factor for EstimatedRTT and DevRTT respectively. Finally, compare both the algorithms and explain why Jacobson's algorithm is better over basic algorithm.	10	CO5