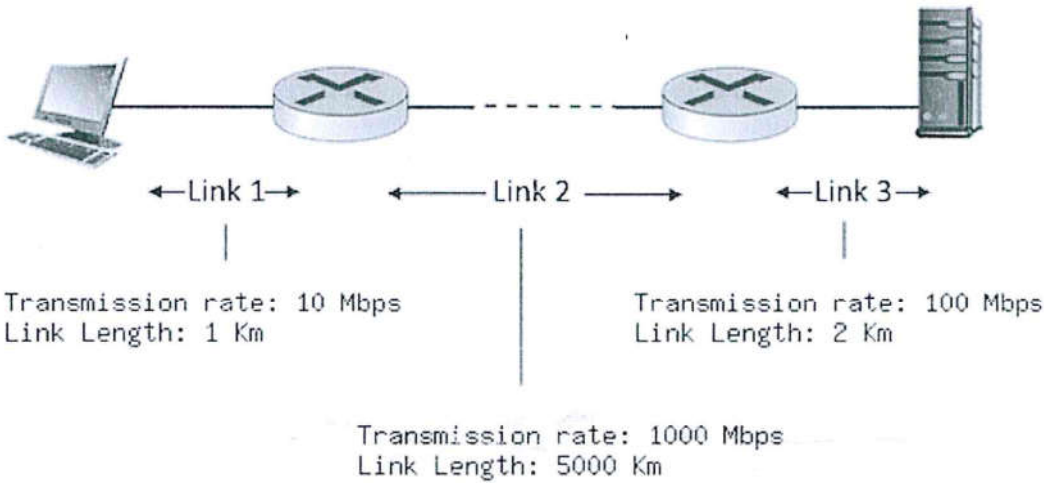
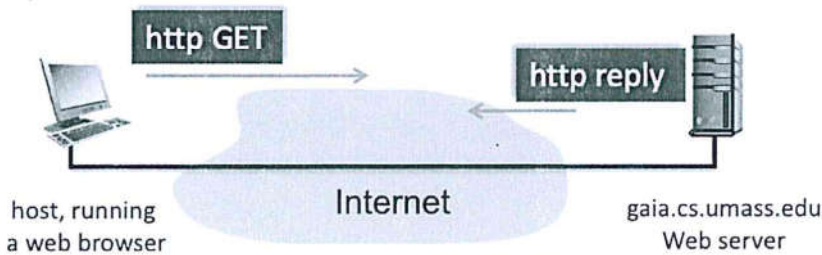


DECEMBER 2020: END SEMESTER ASSESSMENT (ESA) B TECH
IV SEMESTER
UE17CS301– Computer Networks

Time: 3 Hrs

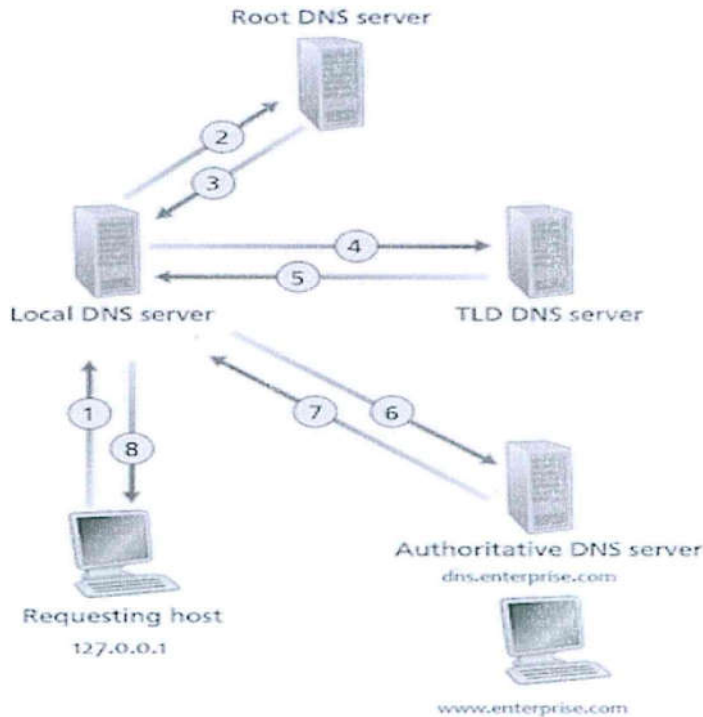
Answer All Questions

Max Marks: 100

1	a)	Compare and contrast Circuit switching and Packet switching.	4
	b)	<p>Consider the network scenario as given below with three links, each with the specified transmission rate and link length.</p>  <p>Assume the length of a packet is 12000 bits. The speed of light propagation delay on each link is 3×10^8 m/sec. Compute the end to end delay (Transmission and Propagation delay) for each link and find the total end-end delay while transmitting the packets from user desktop to server passing through link 1, link 2 and link 3. Note: Give the answer in seconds.</p>	10
	c)	Explain the major functions of transport layer and network layer of OSI model?	6
2	a)	Suppose a user enters URL www.someSchool.edu/someDepartment/home.index that contains text, references to 10 jpeg images, then explain the process of retrieving the web page if the client web browser is defined with Non persistent connection.	6
	b)	<p>Consider the figure below, where the server is sending a HTTP RESPONSE message back the client.</p>  <p>host, running a web browser Internet gaia.cs.umass.edu Web server</p>	6

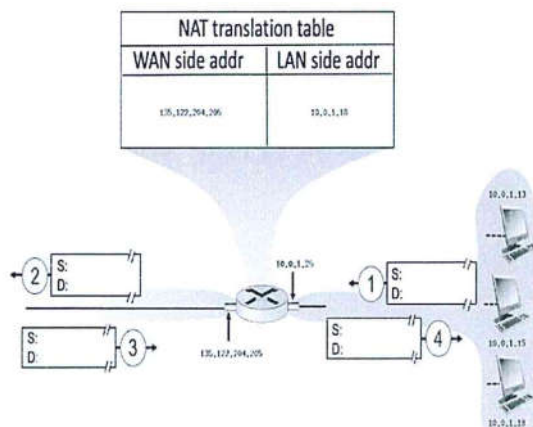
b)	<p>Suppose the server-to-client HTTP RESPONSE message is the following:</p> <pre>HTTP/1.0 404 Not Found Date: Wed, 09 Dec 2020 17:15:51 +0000 Server: Apache/2.2.3 (CentOS) Content-Length: 336 Connection: Close Content-type: text/html</pre> <ol style="list-style-type: none"> 1. Is the response message using HTTP 1.0 or HTTP 1.1? 2. Was the server able to send the document successfully? Yes or No 3. How big is the document in bytes? 4. Is the connection persistent or nonpersistent? 5. What is the type of file being sent by the server in response? 6. What is the name of the server and its version? Write your answer as server/x.y.z 	
c)	<p>Imagine that you are trying to visit <code>www.enterprise.com</code>, but you don't remember the IP address the web-server is running on.</p> <p>Assume the following records are on the TLD DNS server:</p> <ul style="list-style-type: none"> • (<code>www.enterprise.com</code>, <code>dns.enterprise.com</code>, NS) • (<code>dns.enterprise.com</code>, <code>146.54.61.123</code>, A) <p>Assume the following records are on the <code>enterprise.com</code> DNS server:</p> <ul style="list-style-type: none"> • (<code>www.enterprise.com</code>, <code>east4.enterprise.com</code>, CNAME) • (<code>east4.enterprise.com</code>, <code>142.81.17.206</code>, A) • (<code>www.enterprise.com</code>, <code>mail.enterprise.com</code>, MX) • (<code>mail.enterprise.com</code>, <code>247.29.73.151</code>, A) <p>Assume your local DNS server only has the TLD DNS server cached</p> <ol style="list-style-type: none"> 1. What transport protocol(s) does DNS use: TCP, UDP, or Both? 2. What well-known port does DNS use? 3. How many types of Resource Records (RR) are there? 4. List the different types of Resource Records. 5. Can you send multiple DNS questions and get multiple RR answers in one message? Answer with Yes or No 6. To which DNS server does a host send their requests to? Answer with the full name 7. Which type of DNS server holds a company's DNS records? Answer with the full name 8. In the example given in the problem, what is the address of DNS server for <code>enterprise.com</code>? 	8

c)



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|---|----|--|---|
| 3 | a) | Consider the two 16-bit words (shown in binary) below. Compute the Internet checksum value to be transmitted for below given two 16-bit words.
11111111 10110101
00101101 01100110 | 2 |
| | b) | Draw the TCP segment structure and explain their fields briefly. | 6 |
| | c) | Explain the TCP '3-way handshake for connection establishment' and Connection close mechanism with appropriate diagrams | 8 |
| | d) | With a neat diagram, explain TCP fast retransmit. | 4 |

- | | | | |
|---|----|--|---|
| 4 | a) | Consider the scenario below in which three hosts, with private IP addresses 10.0.1.13, 10.0.1.15, 10.0.1.18 are in a local network behind a NAT'd router that sits between these three hosts and the larger Internet. IP datagrams being sent from, or destined to, these three hosts must pass through this NAT router. The router's interface on the LAN side has IP address 10.0.1.25, while the router's address on the Internet side has IP address 135.122.204.205 | 6 |
|---|----|--|---|



4	a)	<div>1. Consider the datagram at step 1, after it has been sent by the host but before it has reached the router. What is the source and destination IP address for this datagram?</div> <div>2. Now consider the datagram at step 2, after it has been transmitted by the router. What is the source and destination IP address for this datagram?</div> <div>3. Will the source port have changed? Yes or No.</div> <div>4. Now consider the datagram at step 3, just before it is received by the router. What is the source and destination IP address for this datagram?</div> <div>5. Last, consider the datagram at step 4, after it has been transmitted by the router but before it has been received by the host. What is the source and destination IP address for this datagram?</div>															
	b)	<div>Provide the IPV6 abbreviations for the following addresses:</div> <div>a. 0000:0000:FFFF:0000:0000:0000:0000:0000</div> <div>b. 1234:2346:0000:0000:0000:0000:0000:1111</div> <div>c. 0000:0001:0000:0000:0000:0000:1200:1000</div> <div>d. 0000:0000:0000:0000:0000:FFFF:24.123.12.6</div>	4														
	c)	<div>Consider a datagram network using 8-bit host addresses. Suppose a router uses longest-prefix matching, and has the following forwarding table: Answer the following questions.</div> <table><thead><tr><th>Prefix Match</th><th>Interface</th></tr></thead><tbody><tr><td>01</td><td>1</td></tr><tr><td>11</td><td>2</td></tr><tr><td>011</td><td>3</td></tr><tr><td>111</td><td>4</td></tr><tr><td>101</td><td>5</td></tr><tr><td>Otherwise</td><td>6</td></tr></tbody></table>	Prefix Match	Interface	01	1	11	2	011	3	111	4	101	5	Otherwise	6	3
Prefix Match	Interface																
01	1																
11	2																
011	3																
111	4																
101	5																
Otherwise	6																
	c)	<div>1. Suppose a datagram arrives at the router, with destination address 01000000. To which interface will this datagram be forwarded using longest-prefix matching?</div> <div>2. Suppose a datagram arrives at the router, with destination address 10110110. To which interface will this datagram be forwarded using longest-prefix matching?</div> <div>3. Suppose a datagram arrives at the router, with destination address 00101101. To which interface will this datagram be forwarded using longest-prefix matching?</div>															
	d)	How to provide address for growing number of users? Discuss about the adhoc/ temporary solutions	7														
5	a)	Consider the Cyclic Redundancy Check (CRC) algorithm and suppose that the 4-bit generator (G) is 1001, that the data payload (D) is 10011010 and that $r = 3$. What are the CRC bits (R) associated with the data payload D, given that $r = 3$? Depict the division clearly.	4														
	b)	Elaborate the CSMA/CD algorithm defined in Ethernet	6														
	c)	With a neat diagram explain the process of routing to another LAN in case of Address Resolution Protocol	6														
	d)	What do you mean by self-learning in switches?	4														