

JK Lakshmipat University Jaipur

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular), November-December 2015
B. Tech. and B.Tech + M.Tech. In Computer Science and Engineering, Semester V
(Common for CSE & ECE)

Roll No.....

CSE503: COMPUTER NETWORKS

Time: 03 hours

Max. Marks: 100

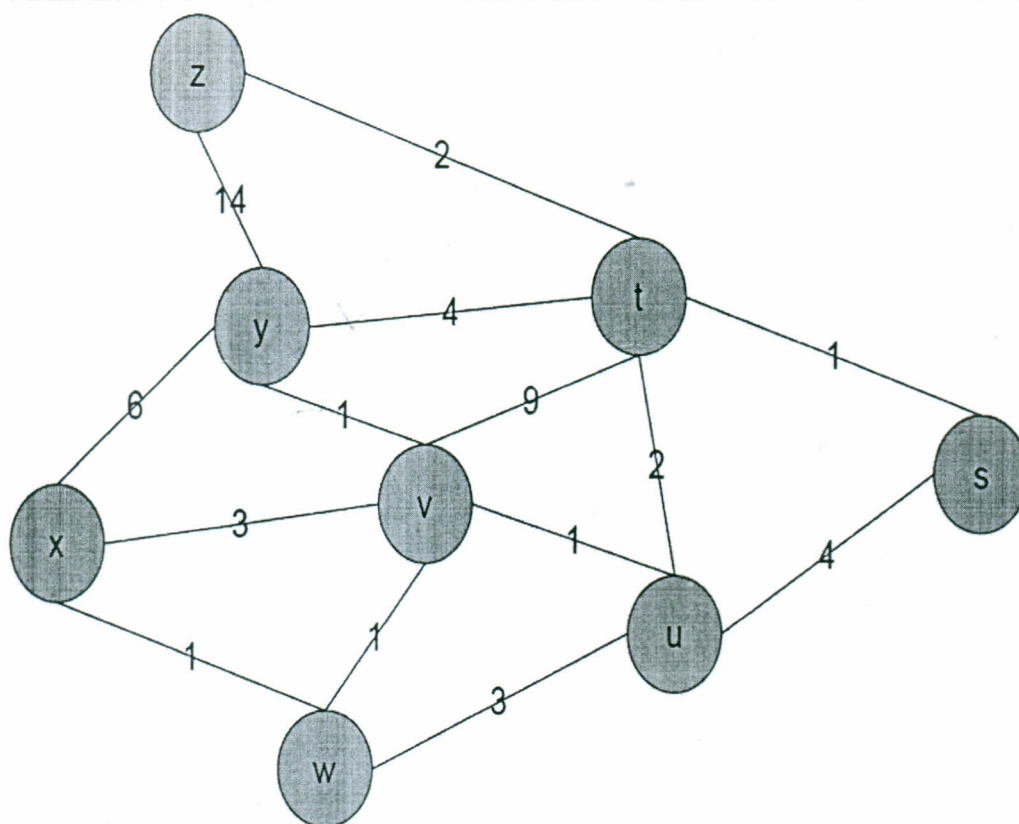
Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1A	Objective type multiple choice questions (10 questions @ 1 mark)	10
i.	In hexadecimal colon notation, a 128-bit long IPv6 address is divided into _____ sections, each comprising _____ hexadecimal digits (a) 4 : 2 (b) 8 : 4 (c) 16 : 2 (d) none of the above	
ii.	When the hop-count field in an IP packet reaches zero and the destination has not been reached, an ICMP _____ error message is sent back to the sending machine. (a) destination-unreachable (b) time-exceeded (c) parameter-problem (d) none of the above	
iii.	Which layer in the OSI reference model is responsible for determining the availability of the receiving program and checking to see if enough resources exist for that communication? A. transport B. network C. session D. application	
iv.	Which of the following application protocols are appropriate for email receiving? (a) SMTP (b) HTTP (c) IMAP (d) POP3	
v.	An ARP reply is normally _____. (a) broadcast (b) multicast (c) unicast (d) none of the above	
vi.	A port address in UDP is _____ bits long. (a) 8 (b) 16 (c) 32 (d) none of the above	
vii.	Acknowledgements, sequencing, and flow control are characteristic of which OSI layer? (a) layer 2 (b) layer 3 (c) layer 4 (d) layer 7	
viii.	The _____ utility allows you to query the DNS database from any	

	computer on the network and find the host name of a device by specifying its IP address, or vice versa? (a) Ipconfig (b) Tracert (c) Nslookup (d) Netstat	
ix.	The ports ranging from 1,024 to 49,151 are called _____. (a) registered (b) dynamic (c) well-known (d) none of the above	
x.	A receiving host has failed to receive all of the segments that it should acknowledge. What can the host do to improve the reliability of this communication session? A. Start a new session using UDP B. Obtain a new IP address from the DHCP server C. Decrease the sequence number D. Decrease the window size	
Q.2	Short answer type questions (4 questions @ 2.5 marks)	10
i.	If an IP datagram has its destination address set to a multicast address, to what places will that packet be delivered?	
ii.	What is the 127.0.0.1 address used for? How about 255.255.255.255? What is the port 0 used for?	
iii.	What were the main difference between RIPv1 and RIPv2?	
iv.	Write the shortest compressed format of the following IPv6 addresses: 1. 2001:0DB8:0000:1470:0000:0000:0000:0200 2. F380:0000:0000:0000:0123:4567:89AB:CDEF	
Q.3A	b) Convert the IP address whose hexadecimal representation is B17F188A to dotted decimal notation. What does this address tell you about its location and why?	05
Q.3B	Suppose datagrams are limited to 1,500 bytes (including header) between source Host A and destination Host B. Assuming a 20-byte IP header, how many datagrams would be required to send an MP3 consisting of 4 million bytes?	05
Q.4A	Assume we are told that an odd parity system is in use and the following binary value is received. 01001011 Explain what we can say about whether or not this value has been corrupted.	05
Q.4B	Suppose A sends two TCP segments back-to-back to B. The first segment has sequence number 90; the second has sequence number 110. How much data is in the first segment? Suppose that the first segment is lost, but the second segment arrives at B. In the acknowledgement that B sends to A, what will be the acknowledgment number?	05
	OR	
Q.4B	Why do DNS queries and responses use UDP instead of TCP? Why do live audio and video traffic typically use UDP?	05
Q.5A	Assume you are given the assignment of setting three different computer labs.	05

	Each lab is configured with a file server, a printer and 30, 32, and 60 PCs respectively. You talked to the network administrator and were given 128.198.63.0/24 subnet for these three labs.	
	1. What are the network address, the broadcast address, and the gateway IP addresses you would like to assign to each of the three subnets? 2. Can 128.198.63.0/27 be enough for the first lab? Why is that?	
Q.5B	Why does FTP use two standard ports Whereas other protocols, in general use only one port? Justify	05
	OR	
Q.5B	Describe NAT and private addresses.	05
Q.6A	The following is a dump of a TCP header in hexadecimal format. 00CD0018 00000EF1 00000D5D 502200D1 01BF0010 a. What is the source port number? b. What is the destination port number? c. What is the sequence number? d. What is the acknowledgment number? e. What is the length of header? f. What is the type of segment? g. What is the window size?	05
Q.6B	An ISP is granted a block of addresses starting with 150.80.0.0/16. The ISP wants to distribute these blocks to 2600 customers as follows. a. The first group has 200 medium-size businesses; each needs 128 addresses. b. The second group has 400 small businesses; each needs 16 addresses. c. The third group has 2000 households; each needs 4 addresses. Design the sub blocks and give the slash notation for each block. Find out how many addresses are still available after these allocations.	05
Q.7A	Using OSPF algorithm, find the shortest path between all nodes. List the hops or links (node tuples) in the order that they are added by the algorithm.	05



Q.7B

05

A router has the following (CIDR) entries in its routing table:

Address/mask	Next hop
129.129.24.0/22	Interface 0
129.129.60.0/22	Interface 1
129.129.61.0/24	Interface 2
Default	Interface 3

(A). From the routing information, construct the corresponding forwarding table. Destination address range Link interface 0 1 2 3

(B). For each of the following IP address, what does the router do if packets with the following addresses arrive?

i. 128.1.59.117	ii. 129.129.59.117	iii. 129.129.62.123
iv. 129.129.61.240	v. 129.129.60.1	

OR

Q.7B	What is DHCP? How it is different from BOOTP? Briefly describe the DHCP state transition diagram?	05
Q.8A	Imagine you have been appointed to design the network to be deployed in three new buildings on a new university campus. Building A contains a dedicated computer room containing 10 very high performance dedicated servers. The servers provide services to students and staff who may need to gain access from the Internet as well as from within the university's own network. Building B contains the offices of 12 lecturers and 8 administrators who only use medium power desktop computers located on fixed desks. Building C contains two lecture rooms and a lounge/coffee shop. The lecture rooms have a desktop computer at the front for use by the lecturers, but some lecturers prefer to use their own laptop or tablet computer. All the	15

students use laptop or tablet computers to take notes and keep in touch with their friends. An underground duct exists between building A and building B which are only 30 meters apart. Building C is 30 meters from building A but no ducts exist and installing one is not possible.

- a) What type of network should be deployed in the building that houses the dedicated computer room and what equipment should be installed?
- b) What type of network should be deployed in the second office building and what equipment should be installed?
- c) What type of network should be deployed in the teaching building and what equipment should be installed?
- d) What type of network connections should be used to link the buildings together and where and how should the university's Internet connection be made?

Q.8B	List the functions of Presentation and session layer.	05
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OR

Q.8B	What are the functions of ICMP protocol?	05
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Q.9A	Consider a network with 6 nodes, A, B, C, D, E, and F. C has three neighbors, B, D, and E. Distance vector routing is used, and the following vectors have just come to router C: from B:(5,0,8,12,6,2); from D: (16,12,6,0,9,10), and from E: (7,6,3,9,0,4). (The numbers in the vectors should be interpreted as, for example, E has a path of length 7 to A, a path of length 6 to B, etc.) The measured delays to B, D, and E, are 6, 3, and 5, respectively. What is C's new routing table? Give both the outgoing line to use and the expected delay.	05
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Q.9B	Compare and Contrast SNMP and SMTP with their pros and cons.	05
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OR

Q.9B	Perform CIDR aggregation on the following /24 IP addresses: 200.96.86.0/24; 200.96.87.0/24; 200.96.88.0/24; 200.96.89.0/24.	05
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