

JK Lakshmipat University Jaipur

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination-II, December 2024

B.Tech. Semester V

Roll No.....

CS1140: Computer Networks

Time: 2 hour 30 Minutes

Max. Marks: 30

Instructions to students:

1. Non-programmable Scientific calculator is allowed.
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	Short answer type questions i). Every business computer across the world has three unique identifiers. What are they? ii). What specific purpose do RTS, CTS and backoff counter serve? iii). What is SIFS? Where is it used? iv). Which one of the two routing protocols, distance vector or link state, exhibit count to infinity problem?	04 Marks CO3
Q.1B	Fill in the blanks: i). RSA algorithm uses _____ key of the recipient and _____ key of sender for encryption of a message. ii). The range of IPv4 addresses from _____ to _____ belong to class B. iii). The subnet mask for an organization with a class C address having seven networks each with 24 hosts is _____. iv). The abbreviated form _____ of IPv6 address is ::AF36:7328:0::87AA:398 v). The hexadecimal representation of IP address _____ is BF330FC4.	03 Marks CO4 CO6

Q.2A	Suppose the routing table entries in a router consisting of the following CIDR entries.	04 Marks CO3										
<table><tr><th>Address/Mask</th><th>Next hop</th></tr><tr><td>135.46.56.0/22</td><td>Interface 0</td></tr><tr><td>135.46.60.0/22</td><td>Interface 1</td></tr><tr><td>192.53.40.0/23</td><td>Router 1</td></tr><tr><td>default</td><td>Router 2</td></tr></table>		Address/Mask	Next hop	135.46.56.0/22	Interface 0	135.46.60.0/22	Interface 1	192.53.40.0/23	Router 1	default	Router 2	
Address/Mask	Next hop											
135.46.56.0/22	Interface 0											
135.46.60.0/22	Interface 1											
192.53.40.0/23	Router 1											
default	Router 2											
For each of the following IP addresses, find the correct sequence of interfaces and the routers that forwards a sequence of packets consisting of one packet each from the following addresses?												
(i) 135.46.63.10, (ii) 135.46.59.14 (iii) 135.46.52.4 (iv) 192.53.43.7												

Q.2B

The estimates of the population of major regions of the world are-

Africa 900 million; South America 500 million; North America 400 million; East Asia 1500 million; South and Central Asia 2200 million; Russia 200 million; Europe 500 million.

1. Suppose each region is to be assigned 100 IPV4 addresses per person. Is this possible? If not, how many addresses can be assigned per person. (2 Marks)
2. Design an appropriate CIDR scheme to provide the addressing(IPV6) for the specified requirements. Give your answer in a tabular form in the table below with brief and pointed justifications. (2 Marks)

Regions	Population (millions)	IP/persons (millions)	128-bit IPv6	
			Network-Id (Number of Bits)	Host-Id (Number of Bits)
Africa	900			
South America	500			
North America	400			
East Asia	1500			
South C Asia	2200			
Russia	200			
Europe	500			

Note: - 1 million = 10^6

Q.3A

Suppose a client and a server are connected by an Ethernet LAN which typically operates at 10Mbps. The Ethernet overhead is 26B. Compute the maximum throughput for a TCP connection that supports MSS of 1024B. Assume that minimum length ACK is 6B and the minimum frame spacing of 12B between Ethernet frames.

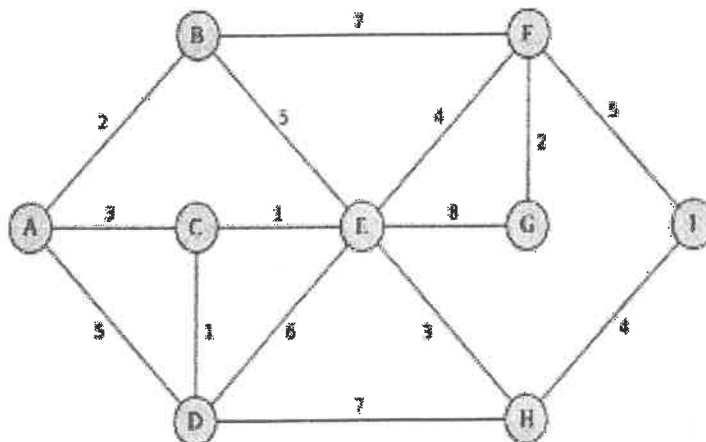
04 Marks
CO2,
CO3

OR

Q.3B

Consider the following network. With the indicated link costs, use Dijkstra's shortest path algorithm to compute the shortest path from all to all network nodes. Show how the algorithm works by computing a table (OSPF Table)

04 Marks
CO3,
CO4



Q.3C	Which of the two protocols CSMA/CD or CSMA/CA do you think is more efficient than the other and why?	02 Marks CO4
Q.4A	Write YES or NO answers in the following describing the delay and the loss tolerant characteristics with one line justification of following network applications.	02 Marks CO4

S. No.	Application	Delay tolerant	Loss tolerant
1	Spam mail		
2	Electronic mail		
3	Search part of a P2P application		
4	Internet gaming		
5	Remote login		
6	High quality medical imaging		
7	Live video streaming		
8	Remote surgery		

Q.4B	Given $n = 33$, find (public, private) key pairs for two party communication using RSA. Indicate that your solution works by first encrypting $M=2$ and decrypting the resulting cypher back to M ?	02 Marks CO3
Q.4C	You have been tasked with designing the network infrastructure for a university campus that includes three main buildings: Academic Building (Building A), Administrative Building (Building B), and Student Center (Building C). Building A: Contains classrooms, labs, and faculty offices where high-speed connectivity and multimedia support are essential. Building B: Houses administrative offices, including finance, HR, Controller of Exam (confidential Data) and student services. Building C: Includes student lounges (3), dining areas (3), and recreational spaces (1) where Wi-Fi connectivity and guest access are critical. A) Draw Topology of this network. (without these remaining answers will not be considered) B) What type of network (wired/wireless, cable types) should be deployed in the building A and what equipment should be installed? C) What type of network (wired/wireless, cable types) should be deployed in the building B and what equipment should be installed? D) What type of network (wired/wireless, cable types) should be deployed in building C and what equipment should be installed? E) What type of network connections and devices should be used to link the buildings together if they are distant apart and where and how should the university's Internet connection be made?	05 Marks CO3

***** All The Best *****

