

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination December 2022

BCA, Semester III

Roll No.....

CS1124: Computer Networks and Networks
Administration

Time: 03 hours

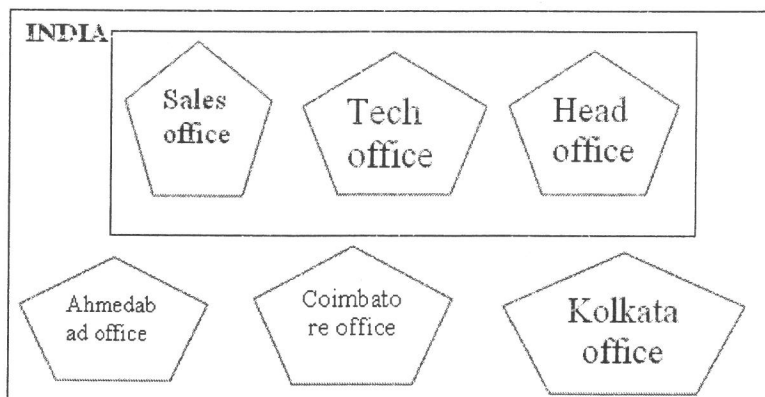
Max. Marks: 30

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 "Hindustan Connecting World Association" is planning to start their offices in four major cities in India to provide regional IT infrastructure support in the field of Education & Culture. The company has planned to set up their head office in New Delhi in three locations and have named their New Delhi offices as "Sales Office", "Head Office" and "Tech Office". The company's regional offices are located at "Coimbatore", "Kolkata" and "Ahmadabad". A rough layout of the same is as follows::

08
CO1,
CO2,
CO3



Approximate distance between these offices as per network survey team is as follows:-

Place From	Place To	Distance
Head Office	Sales Office	10 KM
Head Office	Tech Office	70 KM
Head Office	Kolkata Office	1291 KM
Head Office	Ahmadabad Office	790 KM
Head Office	Coimbatore Office	1952 KM

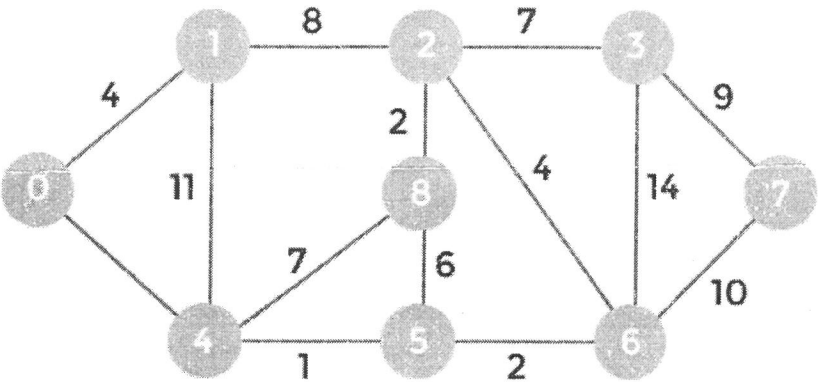
In continuation of the above, the company experts have planned to install the following number of computers in each of their offices:

Head Office	100
Sales Office	20
Tech Office	50
Kolkata Office	50
Ahmadabad Office	50
Coimbatore Office	50

- Design and Draw the Topology for the whole organization.
- Suggest network type (out of LAN, MAN, WAN) for connecting each of the following set of their offices:
 - Head Office and Tech Office
 - Head Office and Coimbatore Office
- Which device you will suggest being produced by the company for connecting all the computers with in each of their offices out of the following devices and why?
 - Switch/Hub
 - Modem
 - Router
 - Multi-Layer Switch
 - Telephone
- Which of the following communication medium, you will suggest being procured by the company for connecting their local office units in New Delhi for very effective and fast communication?
 - Telephone Cable
 - Optical Fiber
 - Ethernet Cable

Wing A to Win S	100 m
Wing A to Wing J	200 m
Wing A to Wing H	400 m
Wing S to Wing J	300 m
Wing S to Wing H	100 m
Wing J to Wing H	450 m

- Suggest a cable/ writing layout for connecting the company's local offices located in New Delhi. Also, suggest an effective method /technology for connecting the company's regional offices at "Kolkata"," Coimbatore" and "Ahmadabad".

Q.1B	Apply Routing Information Protocol (RIP) V2 to find the Routing table of all the nodes and elaborate routing table formation on each node. Also write total number of LAN and WAN in the topology? 	04 CO6, CO4
Q.2A	Given the following TCP header dump in the hexadecimal format, give your answers in the decimal format. CA950071 00000257 7CD000E0 500209AB 8C00340FA (i) What is the source port number? (ii) What is the sequence number? (iii) What is the header length? (iv) Which bits are set in the control field, and what does it mean? (v) What is the window size? Also identify the remaining fields?	05 CO5, CO6
Q.2B	A Large number of consecutive IP addresses are available starting at 198.16.0.0. Suppose four organizations, A, B, C, D request 4000, 2000, 4000, and 8000 addresses, respectively. For each of these organizations, give: - The first IP address assigned and Network Address - The last IP address assigned and Broadcast Address - The mask in the w.x.y.z/s notation?	05 CO1, CO4
Q.3A	Describe why an application developer might choose to run an application over UDP rather than TCP.	04 CO3
OR		
Q.3B	Consider sending a 4000-byte datagram into a link that has an MTU of 500 bytes. Suppose the original datagram is stamped with the identification number 526. - How many fragments are generated? - What are their characteristics? - What are the values in the various fields in the IP datagram(s) generated related to fragmentation? (Assume IPv4 is used so the IP header is 20 bytes in length)	04 CO1, CO2, CO4

Q.4 A router has the following (CIDR) entries in its routing table:

Destination Gateway	Next Hop
170.46.56.0/21	Interface 1
170.46.48.0/20	Interface 2
170.53.40.0/22	Interface 3
Default Gateway	Interface 4

04
CO2,
CO4,
CO5

For each of the following IP addresses, what does the router do if a packet with that address arrives?

- (a) 170.46.63.10/21
- (b) 170.46.67.14/21
- (c) 145.46.52.2/22
- (d) 176.53.40.7/24
- (e) 176.53.56.7/24