Graphic Era

End Term (Even) Semester Examination May-June 2025

Roll no...........................

Name of the Program and semester: Diploma IV
Name of the Course: *Computer Network*
Course Code: DTCS-403
Time: 3 hour

Maximum Marks: 100

Note:
- *(i)* All the questions are compulsory.
- *(ii)* Answer any two sub questions from a, b and c in each main question.
- *(iii)* Total marks for each question is 20 (twenty).
- *(iv)* Each sub-question carries 10 marks.

Q1.
(2X10=20 Marks)
a. Explain the concept of Human Networks and Computer Networks. What are the key differences between them? (CO1)
b. Discuss the benefits of networking in terms of resource sharing, data management, and backup. Provide real-world examples. (CO1)
c. Classify networks based on geography (LAN, MAN, WAN). Compare them in terms of scale, technology, and typical use cases. (CO1)

Q2.
(2X10=20 Marks)
a. Explain the following network topologies: Bus, Ring, Star, Mesh, Tree, and Hybrid. Draw diagrams for each and compare their advantages and disadvantages. (CO2)
b. What is IP addressing? Explain the concept of IP address classes and the role of subnet masking. (CO2)
c. List and explain the functions of different network control devices such as hubs, switches, routers, and gateways. How do they differ in terms of their operation and use cases? (CO2)

Q3.
(2X10=20 Marks)
a. Discuss the construction, working, advantages, and disadvantages of optical fiber as a transmission medium. (CO3)
b. Compare guided media (Twisted Pair, Coaxial Cable, Optical Fiber) with unguided media (Wireless Communication). Explain the key differences in their application areas. (CO3)
c. Explain the working of mobile telephony (cellular networks). Describe the concept of frequency bands used in cellular communication. (CO3)

Q4.
(2X10=20 Marks)
a. Explain the OSI reference model with an emphasis on interlayer communication, data encapsulation, and the role of each layer (Physical, Data Link, Network, Transport, Session, Presentation, and Application). (CO4)
b. What is the TCP/IP reference model? Discuss the layers involved in this model and compare them with the OSI model. (CO4)
c. Describe the concept of horizontal and vertical communication in the OSI model. How do they contribute to network communication? (CO4)

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Q5.

(2X10=20 Marks)

a. What are the main protocols in TCP/IP? Explain the functions of SLIP, PPP, ARP, ICMP, TCP, and UDP with examples. (CO5)

b. Discuss the concept of IP addressing, subnetting, and registered/unregistered addresses. How does subnetting improve network efficiency? (CO5)

c. Explain the process of configuring TCP/IP on a computer system. What are the basic and advanced configuration settings for TCP/IP? (CO5)