GURU JAMBHESWAR UNIVERSITY OF SCIENCE AND TECHNOLOGY, HISAR
Centre for distance and online education Programme: Diploma in Cyber Security

Nomenclature: **Data Structure** Semester: 1st

Code: DCS-11-T Total Marks: 30 Credits: 3+0+0

Important Instructions:

1) Attempt all Questions each assignment given below
2) Each assignment carries 15 marks
3) All questions are to be attempted in legible handwriting on plane white A-4 size paper and upload the scanned copy of the assignments on student's portal

Assignment – I

Q.1 what is Data Structure? Explain different types of Data Structure with examples. Also describe data structure operations.

Q.2 what do you understand by stack? Explain polynomial representation using linked lists and describe algorithms for polynomial addition and multiplication.

Q.3 what do you mean by Queue? Explain circular queue implementation in detail. Show how it overcomes the drawbacks of linear queues.

Assignment – II

Q.1 Explain binary tree traversals (in-order, pre-order, post-order). Derive recursive algorithms for each and analyse their complexity.

Q.2 Define heap data structure. Explain max-heap and min-heap representations with the help of a suitable example for each.

Q.3 Explain the Depth First Search (DFS) and Breadth First Search (BFS) algorithms.

Analyse time and space complexity for each.

GURU JAMBHESWAR UNIVERSITY OF SCIENCE AND TECHNOLOGY, HISAR
Centre for distance and online education Programme: Diploma in Cyber Security

Nomenclature: Data Communication and Networking Semester: 1st

Code: DCS-12-T Total Marks: 30 Credits: 3+0+0

Important Instructions:

1) Attempt all Questions each assignment given below
2) Each assignment carries 15 marks
3) All questions are to be attempted in legible handwriting on plane white A-4 size paper and upload the scanned copy of the assignments on student's portal

Assignment – I

Q.1 Explain the data communication and computer networks. Classify types of networks, describe the OSI model, and briefly explain common network topologies and transmission modes.

Q.2 Describe the transmission media used in data communication. Explain guided media (twisted pair, coaxial, fiber optics) and unguided media (radio, microwave, satellite). Briefly discuss framing, flow control, error control and switching techniques.

Q.3 Explain the Internet addressing system and IP addresses. Describe ARP, RARP, ICMP and IGMP. Briefly discuss routing protocols (distance vector and link-state), networking devices (repeaters, hubs, switches, bridges, routers, gateways) and multiplexing (FDM, WDM, TDM).

Assignment – II

Q. 1 Describe TCP and UDP transport layer protocols and compare their features. Explain the role of ISPs, hosts, domain names and the Domain Name System (DNS) in Internet communication.

Q. 2 Write short notes on the following Internet services: WWW and HTTP, URLs, FTP, email and extranets. For each, state its purpose and one important application.

Q. 3 Write short notes on:
a) Framing and frame formats in data link layer
b) Flow control mechanisms (stop-and-wait, sliding window)
c) Error detection and correction techniques (parity, CRC, Hamming code)

GURU JAMBHESWAR UNIVERSITY OF SCIENCE AND TECHNOLOGY, HISAR
Centre for distance and online education Programme: Diploma in Cyber Security

Nomenclature: Python programming Semester: 1st

Code: DCS-13-T Total Marks: 30 Credits: 3+0+0

Important Instructions:

1) Attempt all Questions each assignment given below
2) Each assignment carries 15 marks
3) All questions are to be attempted in legible handwriting on plane white A-4 size paper and upload the scanned copy of the assignments on student's portal

Assignment – I

Q.1 Explain the decision-making statements in Python. Discuss if, if-else, nested if, and multi-way decision statements (elif) with flowcharts and suitable example.

Q.2 Explain the Python lists. Discuss list creation, indexing, slicing, searching, sorting, and common list operations.

Q.3 Explain file handling in Python. Discuss reading text files using read(), readline(), and readlines()

Assignment – II

Q.1 Explain exception handling in Python. Discuss try, except, else, and finally blocks with examples.

Q.2 Explain classes and objects in Python. Discuss class definition, object creation, and attribute access.

Q.3 Q.3 Explain loop and loop control statements in Python. Compare while and for loops with syntax, flow diagrams, and examples.

GURU JAMBHESWAR UNIVERSITY OF SCIENCE AND TECHNOLOGY, HISAR
Centre for distance and online education Programme: Diploma in Cyber Security

Nomenclature: Cryptography and Network Security Semester: 1st

Code: DCS-14-T Total Marks: 30 Credits: 3+0+0

Important Instructions:

1) Attempt all Questions each assignment given below
2) Each assignment carries 15 marks
3) All questions are to be attempted in legible handwriting on plane white A-4 size paper and upload the scanned copy of the assignments on student's portal

Assignment – I

Q.1 Explain the basic concepts of cryptography. Define plaintext and ciphertext, and describe encryption and decryption. Compare symmetric key and asymmetric key cryptography.

Q.2 Describe symmetric key cryptography. Explain block ciphers and their modes of operation, and briefly discuss DES and AES. Also explain stream ciphers and compare them with block ciphers.

Q.3 What are cryptographic hash functions? Explain MAC and HMAC, stating their properties and applications. Also describe asymmetric key cryptography with reference to Diffie–Hellman, RSA, digital signatures and DSS.

Assignment – II

Q.1 Explain the need for authentication in network security. Describe Kerberos, X.509 authentication service and Public Key Infrastructure (PKI). Briefly explain email security using PGP and S/MIME.

Q.2 Explain the IP Security (IPSec) and its basic architecture. Briefly describe Authentication Header (AH) and Encapsulating Security Payload (ESP). Also explain the role and types of firewalls, and give a short note on Intrusion Detection and Prevention Systems (IDPS).

Q.3 Explain intrusion detection systems (IDS) and intrusion prevention systems (IPS). Compare signature-based and anomaly-based detection techniques and discuss their limitations.

GURU JAMBHESWAR UNIVERSITY OF SCIENCE AND TECHNOLOGY, HISAR
Centre for distance and online education Programme: Diploma in Cyber Security

Nomenclature: Operating Systems Semester: 1st

Code: DCS-15-T Total Marks: 30 Credits: 3+0+0

Important Instructions:

1) Attempt all Questions each assignment given below
2) Each assignment carries 15 marks
3) All questions are to be attempted in legible handwriting on plane white A-4 size paper and upload the scanned copy of the assignments on student's portal

Assignment – I

Q.1 Briefly discuss the evolution of Operating Systems and describe the main types of Operating Systems: Batch, Multiprogramming, Time Sharing, Real-Time, Multitasking and Multithreading. Also outline the major services provided by an Operating System.

Q.2 Describe Contiguous Memory Allocation in detail. Explain Fixed (static) Partitioning and Variable (dynamic) Partitioning schemes with neat diagrams, and discuss the problems of internal and external fragmentation in each case.

Q.3 Describe Non-Contiguous Memory Allocation techniques. Explain Paging and Segmentation with suitable diagrams, clearly bringing out the idea of logical address, physical address, page table, segment table, and address translation.

Assignment – II

Q.1 Define Virtual Memory and explain its need. Discuss the implementation of Virtual Memory using Demand Paging, and briefly mention the role of page replacement algorithms. Highlight the advantages and limitations of Virtual Memory.

Q.2 Explain CPU scheduling in Operating Systems. Describe in detail the following CPU scheduling algorithms with examples and diagrams where necessary:
(a) First Come First Serve (FCFS)
(b) Shortest Job First (SJF)
(c) Shortest Remaining Time Next (SRTN)
Also discuss the advantages and disadvantages of each algorithm.

Q.3 Explain the concept of deadlock in Operating Systems. Discuss the four necessary conditions for deadlock and explain deadlock prevention, avoidance, detection, and recovery strategies.