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PGIIS-N 1029 A-19

MSc. II Semester Degree Examination

COMPUTER SCIENCE

(Data structures Using C++)

Paper - HCT 2.1

(New)

Time : 3 Hours **Maximum Marks : 80**

Instructions to Candidates:

1. Section A is **compulsory**.
2. Answer any **five** questions from Section B.

Section - A

1. Answer the following questions : **(10×2=20)**

a) Differentiate between linear with non - linear data structures.

b) Compare insertion sort and selection sort.

c) Define time complexity.

d) What is Circular linked list?

e) With a neat diagram, represent 4 elements (10,20,25,8) in a circular linked list.

f) Define a node of a single linked list in C++.

g) What are the applications of stack?

h) Define recursion.

i) Define binary search tree.

j) What is directed graph?

Section - B

2. a) Explain major operations on data structures, with relevant examples. **(6)**

b) Write Merge Sort algorithm. **(6)**

3. a) Explain how arrays are implemented. Differentiate between row - major representation and column - major representation of matrices. **(6)**

b) Write a C++ program to sort an array of numbers. Using selection sort. **(6)**

4. a) What are the advantages and disadvantages of doubly linked list over singly linked list? Explain the application of doubly linked list. (6)

   b) Explain the representation of singly linked list. (6)

5. a) Explain how insertion can be carried in sorted singly linked list. (6)

   b) What is priority queue? Explain its applications. (6)

6. a) Describe the various operations of Queue. List its applications. (6)

   b) Show the output of Tower of Hanoi for 3 discs. (6)

7. a) What is an AVL tree? Assuming k = 2, construct an AVL tree for the following numbers 1,3,4,7,5,6,2,8,9 in the order they appear. (6)

   b) Define Graph. Discuss about various graph operations. (6)

8. Write notes on any two of the following :

   a) Quick sort

   b) Circular linked list

   c) Applications of Stacks

   d) DFS

(2×6=12)

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PGIIS-N-1031 A-19

M.Sc. II Semester Degree Examination

COMPUTER SCIENCE

Data Communications and Networks

Paper - SCT 2.1

(New)

Time : 3 Hours **Maximum Marks : 80**

Instructions to Candidate:

1. *Section A is Compulsory.*
2. *Answer Any **Five** questions from Section B.*

Section - A

I. Answer the following questions: (10×2=20)

a) Define LAN.

b) List the components of data communication.

c) What is SNR?

d) What is the use of bridge?

e) Define Bandwidth.

f) What is ACK?

g) What is Circuit Switching?

h) What are the interfaces provided by protocols?

i) What is Congestion?

j) Define TDM.

Section - B

2. a) Explain the components of Data Communication. (6)

b) Compare OSI Reference model with TCP/IP. (6)

3. a) Describe Guided transmission media. (6)

b) Differentiate between LAN and WAN network categories. (6)

4. a) Describe HDLC in detail. (6)

   b) Illustrate Sliding window ARQ error control mechanism. (6)

5. a) Apply CRC method to the message M(x)=11101111 where G(x)=100. (6)

   b) Describe flow control and error control mechanism. (6)

6. a) Illustrate the Link State Routing algorithm with an example. (6)

   b) With a neat diagram, explain Packet Switching. (6)

7. a) Explain Congestion Control Mechanism. (6)

   b) What are the functions of SMTP. (6)

8. Write notes on any **two** of the following: (2×6=12)

   a) Modems

   b) Hamming Code

   c) Subnetting

   d) Sockets

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