(6 pages) Reg. No. : ....

Code No. : 10752 E   Sub. Code : EMCS 21

B.Sc. (CBCS) DEGREE EXAMINATION,
APRIL 2024

Second Semester

Computer Science – Core

DATA STRUCTURE AND ALGORITHM

(For those who joined in July 2023 onwards)

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. What is a data structure?

   (a) A programming language

   (b) A collection of Algorithms

   (c) A way to store and organize data

   (d) A type of computer hardware

2. Minimum number of fields in each node of a doubly linked list is ——————.

   (a) 2   (b) 3

   (c) 4   (d) 5

3. A queue follows : ——————.

   (a) LIFO principle

   (b) FIFO principle

   (c) Linear Tree

   (d) Ordered array

4. The terms push and pop related to : ——————.

   (a) Array   (b) Lists

   (c) Stacks   (d) Trees

5. The operation of processing each element in the list is known as ——————.

   (a) Sorting   (b) Merging

   (c) Inserting   (d) Traversal

6. Which of the following is non-linear data structure?

   (a) Stack   (b) List

   (c) Strings   (d) Trees

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7. A graph in which all vertices have equal degree is known as ——————.

   (a) Complete Tree

   (b) Regular graph

   (c) Multi graph

   (d) Simple Graph

8. The data structure required for Breadth First Traversal on a graph is : ——————..

   (a) Array   (b) Stack

   (c) Tree   (d) Queue

9. Find the location of a given item in a collection of items is called : ——————.

   (a) Discovering

   (b) Finding

   (c) Searching

   (d) Mining

10. —————— sorting is good to use when alphabetizing a large list of names.

   (a) Merge   (b) Heap

   (c) Radix   (d) Bubble

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PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) What is Doubly Linked List?

    Or

    (b) Expand and give a note on ADT.

12. (a) Write down any three applications of Queue.

    Or

    (b) What is Circular Queue?

13. (a) Differentiate : B Tree Versus B+ Tree.

    Or

    (b) Define the terms Binary Tree and Binary Search Tree.

14. (a) How to represent Graph?

    Or

    (b) Write down the three application of graph.

15. (a) What do you mean by Open Addressing?

    Or

    (b) Give a brief note on Hashing.

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[P.T.O.]

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain in detail about Singly Linked List.

Or

(b) Illustrate Circular Linked List in detail.

17. (a) Write down any two operations done on stack.

Or

(b) How to convert infix to postfix expression? Explain with an example.

18. (a) Disucss in detail about AVL Trees.

Or

(b) What is expression Tree? List out application of Trees.

19. (a) Articulate Breadth First Traversal in detail.

Or

(b) Write short note on the following :

(i) Bi connectivity

(ii) Cut vertex.

20. (a) How do you implement Linear Search? Explain with an example.

Or

(b) Define Insertion Sort. Write a procedure for Insertion Sort.

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