

Code No. : 20329 E Sub. Code : AMCS 41

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.

Fourth Semester

Computer Science – Core

DATA STRUCTURES

(For those who joined in July 2020 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. A \_\_\_\_\_ is a finite set of instructions.  
(a) Profile (b) Algorithm  
(c) Code (d) Data Structure
2. Queues are known as \_\_\_\_\_ lists.  
(a) FIFO (b) LIFO  
(c) TOP (d) BOTTOM.

3. Deletion in queue take place at one end called \_\_\_\_\_  
(a) Start. (b) Front.  
(c) Rear. (d) Mid.
4. A node in a doubly linked list was at least \_\_\_\_\_ fields.  
(a) 3 (b) 2  
(c) 4 (d) 5
5. The number of sub trees of a node is called its \_\_\_\_\_  
(a) Degree (b) Forest  
(c) Level (d) Terminal
6. A \_\_\_\_\_ is a set of domains.  
(a) Profile (b) Algorithm  
(c) Code (d) Data Structure
7. A \_\_\_\_\_ is an ordered list in which all insertions and deletions are made at one end called top.  
(a) Queue (b) Trees  
(c) Graphs (d) Stack

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8. The items are stored in a memory locations by means of pointer is called \_\_\_\_\_  
(a) Tree (b) Stack  
(c) Linked list (d) Graph
9. The number of nodes in a full binary tree of depth four is \_\_\_\_\_  
(a) 15 (b) 16  
(c) 14 (d) 12
10. A \_\_\_\_\_ is a collection of records, each record having one or more fields.  
(a) File (b) Tree  
(c) Data Item (d) Structure

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Define:  
(i) Data Structure  
(ii) Algorithm.  

Or

(b) What are different types of asymptotic notation? Give example.

12. (a) What is a queue? Explain the various operations performed on a queue.  

Or

(b) Elaborate the applications of stack.
13. (a) What are the advantages and disadvantages of representation a binary tree?  

Or

(b) Describe the transforming a forest into a binary search tree.
14. (a) Write down the graph abstract data type.  

Or

(b) Mention the purpose of depth first search.
15. (a) Write a note on external sorts.  

Or

(b) Which data structure is used in hash tables? Explain.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Draw and explain the Abstract Data Type model.

Or

- (b) Discuss the representation of multidimensional arrays.

17. (a) What is a stack? What are the operations to manipulate a stack?

Or

- (b) Write down the evaluating postfix expressions with example.

18. (a) What is a binary search tree? Describe the insertion operation in binary search tree.

Or

- (b) Explain the algorithm for postorder traversal of a binary tree.

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19. (a) Outline the minimum cost spanning trees using prim's algorithm.

Or

- (b) Evaluate the single source all destination path algorithm.

20. (a) Write an algorithm for quick sort and explain it.

Or

- (b) Illustrate the concept of recursive merge sort with example.

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