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

Code No. : 30602 E **Sub. Code : SMCS 33/ SMSE 33**

B.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2020.

Third Semester

Computer Science / Software Engineer – Core

DATA STRUCTURES

(For those who joined in July 2017)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. An array is a collection of ————.
   (a) similar data items
   (b) different data items
   (c) integers
   (d) characters

2. The time complexity of binary search is ————.

(a) $0(n)$ (b) $0(\log_2 n)$

(c) $0(1)$ (d) $0(n^2)$

3. The stack uses the principle ————.

(a) FIFO (b) LIFO

(c) LILO (d) None

4. A node in a doubly linked list has atleast ———— fields.

(a) 1 (b) 3

(c) 2 (d) 4

5. The node in a tree which doesnot have a predecessor is called ————.

(a) child (b) root

(c) leaf (d) interior node

6. The number of subtrees in a node is called ————.

(a) Siblings (b) Indegree

(c) Degree (d) Outdegree

7. Self edge is also known as ————.

(a) loop (b) list

(c) indegree (d) siblings

8. A connection between vertices is ————————.

(a) tree (b) root

(c) edge (d) none

9. The time complexity of merge sort is ————————.

(a) $0(n \log n)$ (b) $0(\log(n))$

(c) $0(\log(2n))$ (d) None

10. Each iteration of the quick sort selects an element known as ————————.

(a) mid (b) pivot

(c) mean (d) none

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) What are the drawbacks of array structure?

Or

(b) Write the sequential search algorithm.

12. (a) Explain about linked representation of a polynomial.

Or

(b) Write an algorithm to delete a node from a linked queue.

13. (a) Discuss the advantages and disadvantages of various memory representations of binary trees.

Or

(b) Write an algorithm to insert a node in a binary search tree.

14. (a) Write short notes on spanning tree.

Or

(b) Write a note on all pairs shortest path in a graph.

15. (a) Explain the types of merging.

Or

(b) Define collision and write any one of the collision and resolution method.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) How to represent multi dimensional array?

Or

(b) Write a recursive algorithm for binary search with example.

17. (a) Write an algorithm to add two polynomials by using linked list with an example.

Or

(b) Write short notes of the following :

(i) stack

(ii) queue

(iii) linked list.

18. (a) Define and discuss about the heap data structure with suitable algorithm.

Or

(b) Draw a binary tree with 5 nodes and explain the three types of traversals in detail.

19. (a) Write a note on graph traversals with suitable example.

Or

(b) Explain the various methods of graph representation.

20. (a) Give an example of quicksort and explain each steps with algorithm.

Or

(b) Write a note on merge sort with algorithm.

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