

(6 pages)

Reg. No. :

Code No. : 9911

Sub. Code : HCAM 22

M.C.A. (CBCS) DEGREE EXAMINATION,
APRIL 2015.

Second Semester

DATA STRUCTURES AND ALGORITHMS
USING C++

(For those who joined in July 2012 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Storage needed by a program is referred as _____.
(a) Time complexity (b) Space complexity
(c) Both (d) None
2. Which of the following case does not exist in complexity theory?
(a) Best case (b) Worst case
(c) Average case (d) Null case

3. Stack is based on _____.

(a) LIFO (b) FIFO
(c) Both (d) None

4. Queue is based on _____.

(a) FIFO (b) LIFO
(c) Link (d) None

5. A binary tree of depth "d" is an almost complete binary tree if

(a) each leaf in the tree is either at level
(b) for any node
(c) both (a) and (b)
(d) none

6. The postfix expression for the infix expression $A + B * (C + D) / F + D * E$ is

(a) $AB+CD+*F/D+E*$ (b) $ABCD+*F/+DE*+$
(c) $A*B+CD/F*DE++$ (d) $A+*BCD/F*DE++$

7. The maximum degree of any vertex in a simple graph with n vertices is

(a) n (b) n-1
(c) n+1 (d) none

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8. Each finite connected graph has a _____.
 (a) binary tree (b) special tree
 (c) spanning tree (d) none
9. Aim of knapsack problem is to _____.
 (a) maximize allocation
 (b) minimize allocation
 (c) both
 (d) none
10. Algorithm is a _____.
 (a) step by step representation of a problem
 (b) pictorial representation
 (c) both
 (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) Explain in detail on arrays and its features.
 Or
 (b) Implement an algorithm for linear sorting.
 Discuss its complexity.

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12. (a) Explain an algorithm for parenthesis matching using stack.

Or

- (b) Explain an application where circular queue is better than general queue.

13. (a) What do you mean by binary tree? How it will differ from general tree. Explain with an example.

Or

- (b) Explain the procedure used to insert a node in binary search tree.

14. (a) How do you represent graph? Explain with an example.

Or

- (b) What do you mean by connected components? Explain with an example.

15. (a) Write a note on divide and conquer algorithm. Explain an algorithmic skeleton for divide and conquer approach.

Or

- (b) What do you mean by greedy approach? Explain with an example.

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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 asymptotic notation with an example.

Or

- (b) Briefly explain polynomial representation using linked list.

17. (a) Explain in detail on representation of stack using linked list.

Or

- (b) Briefly explain the implementation procedure for queue using array.

18. (a) Discuss in detail about various operations on binary search tree.

Or

- (b) Explain the way to implement binary tree using linear list.

19. (a) Explain Breadth First search algorithm with an example.

Or

- (b) Discuss in detail on any one of the graph search method with an algorithm.

20. (a) Explain an algorithm for container overloading problem.

Or

- (b) Discuss branch and bound approach. Explain with an example.

