PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2019
(Second Semester)

Branch - **COMPUTER SCIENCE**

DATA STRUCTURES

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 x 1 = 10)

1 The time taken by binary search algorithm to search a key in a sorted array of n elements is
(i) 0 (log n) (ii) O(n)
(iii) 0(n log n) (iv) 0(n/2)

2 Prim's algorithm is used
(i) To find the shortest path (ii) To find the minimum spanning tree
(iii) To find the elements (iv) Evaluation of postfix expression

3 _____is an algorithm design method that can be used when a solution to the problem is viewed as the result of sequence of decisions.
(i) Dynamic programming (ii) Greedy method
(iii) Divide and conquer (iv) Branch and bound method

4 _____problem to find a tour of minimum cost.
(i) Multistage graph (ii) Knapsack
(iii) Traveling salesman (iv) Flow shop

5 O(n) to mean a computing time is
(i) Linear (ii) Quadratic
(iii) Constant (iv) Exponential

6 _____is the process of executing a correct program on data sets and measuring the time and space it takes to compute the results.
(i) Performance measurement (ii) Debugging
(iii) Validation (iv) Analysis

7 A_____ is an ordered list in which all insertions and deletions are made at one end called top.
(i) Queue (ii) Trees
(iii) Graphs (iv) Stack

8 The items are stored in a memory locations by means of pointers is called___
(i) Tree (ii) Stack
(iii) Linked list (iv) Graph

9 Children of the same parent are said to be_____ .
(i) Siblings (ii) Level
(iii) Non terminal (iv) Structure

10 The number of nodes in a full binary tree of depth four is
(i) 15 (ii) 16
(iii) 14 (iv) 12

Cont...

SECTION - B (25 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 5 = 2 5)

11 a What is an array? Describe the various operations on array.

OR

b Summarize the sparse matrices,

12 a W'rite down the algorithm for selection sort.

OR

b State the algorithm for sequential search.

13 a Suppose LIST is in memory. Write an algorithm which deletes the last node from LIST,

OR

b Bring out the importance of dynamic memory allocation.

14 a How is a recursion works? Write a recursive procedure to find the factorial of a given number.

OR

b Compare the circular queue and dequeue.

15 a Elucidate the insertion and deletion of nodes in binary trees.

OR

b Analyze the heap sort with simple example.

SECTION -C (40 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 8 = 40)

16 a Classify the time and space complexity.

OR

b Enumerate the concept of pointers in data structure.

17 a Discuss about the merge sort algorithm.

OR

b Write an algorithm for binary search.

18 a Explain the representation of linked list in memory.

OR

b Point out the algorithm to insert item as the first node in the linked list.

19 a Justify the basic operations on stack.

OR

b Outline the concept of priority queue.

20 a Examine the binary tree traversals with suitable examples.

OR

b What is a binary tree? Explain the various representations of binary tree.

Z-Z-Z **END**