M.C.A. Second Semester (First Year) (CGS)

15510 : Data Structures & Algorithms : 2 MCA 1 / 2 CS 1

P. Pages : 2 | AU - 3153

Time : Three Hours | Max. Marks : 80

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Notes : 1. Due credit will be given to neatness and adequate dimensions.
2. Assume suitable data wherever necessary.
3. Illustrate your answer necessary with the help of neat sketches.
4. Use of pen Blue/Black ink/refill only for writing the answer book.

1. a) What are the main parameters considered to measure the complexity of the algorithm? 6

   b) Explain the record - oriented fixed length storage used for storing the strings with its advantages & disadvantages. 7

OR

2. a) Explain first pattern matching Algorithm with the help of suitable ex. 7

   b) Explain the following string processing operations - 6

      i) Substring

      ii) Indexing

      iii) Replacement

3. a) Explain how to represent multi - dimensional array in the memory. 6

   b) State & explain the Binary search algorithm with its complexity & limitations. 7

OR

4. a) State & explain the structure & working of pointer arrays with ex. 6

   b) State & explain the sorting of the elements with the help of Bubble sort. 7

5. a) Explain structure & working of one-way linked list with representation of it in the memory. 7

   b) Write down the algorithm for deletion of node with given item of information. 6

OR

6. a) Explain structure & working of two way linked list. 6

   b) State & Explain the algorithm for Insertion of the node in the sorted linked list. 7

7. a) State & explain the Quick Sort algorithm. 7

b) Write down the algorithm for evaluation of post fixed expression. 7

OR

8. a) Write down the algorithm to insert the element in the queue. 7

b) Translate the following infix expression into its post fix expression. 3

i) $(A-B)*(D/E)$

ii) $(A+B\uparrow D)/(E-F)+G$

iii) $A*(B+D)/E-F*(G+H/K)$

c) Explain : 4

i) Priority Queue ii) Dqueue

9. a) Explain the concept of "Binary Tree" Explain its linked representation in the memory. 7

b) Draw the corresponding binary tree of following expression. 7

$[a+(b-c)]*[(d-e)/(f+g-h)]$

also translate the above expression into -

i) Pre - order

ii) Post - order

OR

10. a) Explain how to find an element in a binary search tree in the memory. 7

b) Write down pre - order traversal algorithm. Using stack with the help of suitable ex. 7

11. a) State & explain the DFS search algorithm with suitable ex. 7

b) What is Hashing? Explain Dynamic hashing. 6

OR

12. a) State & explain 'section sort' with ex. 6

b) Write down the algorithm for inserting the nodes in the graph. 7

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