

FYCS/SEM II/REG/DESIGN AND ANALYSIS OF ALGORITHM

Time: 2½ hrs.

Marks:75

- Note:
1. All questions are compulsory with internal choice.
 2. Draw neat diagrams wherever necessary.
 3. Figures to the right indicate full marks.

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- Q.1 Answer the following (any four) (20)**
- (a) What is data structure? And explain types of data structure.
 - (b) What is stack? Explain operation of stack with example.
 - (c) Evaluate postfix expression from given expression.
1) $(A-B)*C-(F+G)$ 2) $A/B+C-D*G$
 - (d) Write a short note on Big-O Notation and Omega- Ω Notation.
 - (e) What is an algorithm? And explain its characteristics.
 - (f) Write a short note a) Rate of growth b) Types of analysis
- Q.2 Answer the following (any four) (20)**
- (a) Write a note on Pattern matching using brute force algorithm in string.
 - (b) Write a note on any two basic sorting techniques.
 - (c) Explain Tower of Hanoi problem with an example.
 - (d) Difference between 1) Recursion and Iteration 2) Linear and binary search
 - (e) Sort a given list using bubble sort. 1) 4,21,9,30,14 2) 6,31,22,15,12
 - (f) Explain Fibonacci of a given number using recursive and iterative method.
- Q.3 Answer the following (any four) (20)**
- (a) Explain greedy technique with its advantages and disadvantages.
 - (b) Explain bottom-up approach with example in dynamic programming.
 - (c) Explain classification of algorithm using Implementation and Design Method.
 - (d) Sort a given list using merge sort.
200,470,150,0,90,40,400,300,120,70
 - (e) Explain the concept of divide and conquer concept and its advantages and disadvantages.
 - (f) Determine the Longest common subsequence of
 $x=MZJAWXU$ $y=MJYAUZ$
- Q.4 Answer the following (any five) (15)**
- (a) Explain estimating running time / number of steps of executions on paper (Any two).
 - (b) Write a short note on Theta- Θ Notation.
 - (c) Sort a given list using insertion sorting technique.
62,17,30,15,44
 - (d) Explain factorial of a given number using recursive method.
 - (e) Explain the concept of divide and conquer concept.
 - (f) Explain Dynamic Programming advantages and disadvantages.

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