

Total No. of Questions : 8]

SEAT No. :

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[5059]-641

B.E. (Computer Engineering)

DESIGN & ANALYSIS OF ALGORITHMS

(2012 Course)

Time : 2.30 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 and Q.7 or Q.8.
- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

**Q1)** a) Which Algorithm strategy used by quick sort? Write recurrence relation for quick sort & solve it. [6]

b) Compare following Algorithm strategies [6]

- i) Divide & Conquer
- ii) G ready approach
- iii) Dynamic programming

c) Solve following job sequencing problem using G ready approach. [8]

$N = 7$ , Profit  $(P_1 \dots P_7) = (3, 5, 20, 18, 1, 6, 30)$

dead: ne  $(d_1 \dots d_7) = (1, 3, 4, 2, 3, 2, 1)$

OR

**Q2)** a) Explain the following for dynamic programming. [12]

- i) Principle of optionalizing with example.
- ii) Matrix multiplication problem

b) Given  $n = G$  and weight  $(w_1 w_2 w_3 w_4 w_5) = (7, 11, 13, 24, 10)$ . Find all subset whose sum is 41, using sum of subsets Algorithm. [8]

P.T.O.

- Q3)** a) Which are different approaches of writing Randomized Algorithm? Write Randomized sort Algorithm. [8]
- b) Explain following with relations with each other. [8]
- i) Polynomial Algorithms
  - ii) Non-Polynomial Hard Algorithms
  - iii) Non-polynomial complete Algorithms

OR

- Q4)** a) What is 0-1 Knap sack problem? Explain the Algorithm as deterministic & non-deterministic versions. [10]
- b) What NP– complete Algorithm? How do we prove that algorithm is NP compiler? (Give example) [6]

- Q5)** a) What is mean by parallel Algorithms? What are way by which we can achieve parallelism is Algorithm? [6]
- b) Explain sequential & parallel Algorithm for merge sort for the following arrays. [10]

$A[8] = [11, 4, 30, 11, 20, 5, 8, 2]$

OR

- Q6)** a) How parallel Algorithm can be used to solve graph problem? [8]
- b) How complete binary tree is useful for parallel algorithms? Give any example you are familiar with. [8]

- Q7)** a) What is clustering? How clustering is used in data management? Explain with any Algorithm used in clustering. [12]
- b) Explain various elements of IOT (Internet of things). [6]

OR

- Q8)** a) State & explain different software engineering algorithms. [9]
- b) Write KMP algorithm for string matching Algorithm. [9]

