P2036

[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 $(P_1 .... P_7) = (3, 5, 20, 18, 1, 6, 30)$

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

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]**

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

<div align="center">OR</div>

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]

<div align="center">OR</div>

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]**

<div align="center">OR</div>

Q8) a) State & explain different software engineering algorithms. **[9]**

b) Write KMP algorithm for string matching Algorithm. **[9]**

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