APR. -17/BE/Insem -87
B.E. (Computer Engineering)
OPERATION RESEARCH FOR ALGORITHMS IN SCIENTIFIC APPLICATIONS
(2012 Pattern) (Semester -II)

Time : 1Hour]   *[Max. Marks : 30*
Instructions to the candidates:
   1)   *Use of non-programmable calculator is allowed.*
   2)   *Solve Q 1 or Q 2, Q 3 or Q 4, Q 5 or Q 6.*
   3)   *figures to the right indicate full marks.*
   4)   *Assume suitable data, if necessary.*

Q1) a)   Explain Operation Research Impact and phases? Give its one example?
[6]

   b)   What is mean by productivity improvement? Give any one Scientific application   **[4]**

OR

Q2) a)   What is mean by mathematical model of a real situation? Discuss the importance of models in the solution of operation research problem.**[5]**

   b)   Explain in details Graphical Method of solving LP problem.   **[5]**

Q3) a)   Describe the component associated with basic structure of linear programming model?   **[6]**

   b)   An Inventory Model - Multiperiod Decision problems. A factory must produce a certain product over the next four quarters. The demand for each quarter is known. The factory wants to minimize total costs and has to meet all demands on time. The appropriate data are given in the following table: **[4]**

	Q I	Q II	Q III	Q IV
Demand (units)	35	70	80	30
Maximum Production level (units)	70	70	70	70
production cost ($/unit)	45	60	60	65
Storage cost ($/unit/quarter)	1	1	2	-

OR

Q4) a) What are the major assumptions of linear programming model for reducing the complex real world problem into a simplified form. **[4]**

b) Describe the steps of simplex algorithm for obtaining an optimal solution to linear programming problem. **[6]**

Q5) a) What is formation of transportation problem? Explain the method for solving such a problem. **[4]**

b) A Company has three production facilities S1, S2, and S3 with production capacity of 5,7 and 14 units (In 100s) per week of a product respectively. These units are to be shipped to four warehouses D1, D2, D3 and D4 with requirement of 2, 4, 6 and 16 unit (in100s) per week respectively. The transportation cost (in rupees) per units between factories to warehouses are given in the table below. **[6]**

	D1	D2	D3	D4	Supply (Availability)
S1	15	40	50	20	8
S2	50	40	30	50	10
S3	60	6	40	30	15
Demand (Requirement)	5	6	8	17	30

Formulate this transportation problem as an Linear programming model to minimize the total transportation cost

OR

Q6) a) What are basic step of Initial feasible solution. **[4]**

b) Specify the dual of an assignment problem. What are the techniques used for solving an assignment problem? **[6]**

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