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Total No. of Pages : 03

Total No. of Questions : 08

M.Tech.(ME) (Sem.-1) OPTIMIZATION TECHNIQUES Subject Code : MME-501 M.Code : 38202

Time: 3 Hrs.

Max. Marks: 100

INSTRUCTIONS TO CANDIDATES :

- 1. Attempt any FIVE questions out of EIGHT questions.
- 2. Each question carries TWENTY marks.
- Q1. a) Explain the important characteristics of the industrial situation to which I.P. method can be successfully applied. Illustrate application of these technique with a suitable example.
 - b) A company sells two different products A and B the company makes a profit of Rs. 40 and Rs. 30 on two products respectively. They are produced by a common production process and are sold in two different markets. The production process has a capacity of 30,000 man hours. It takes 3 hours to produce a unit of A and 1 hour to produce a unit of B. The maximum number of Units of A and B that can be sold in the market are 8000 and 12,000 respectively. Formulate the above as linear programming model.
- Q2. A person require 10, 12 and 12 units of chemical A, B and C respectively for his garden. A liquid product contains 5, 2 and 1 unit of A, B and C respectively per jar. A dry product contains 1, 2 and 4 units of A, B and C per carton. If the liquid product sells for Rs. 3 per jar and the dry product sells for Rs. 2 per carton. How many of these should be purchased to minimize the cost and meet the requirement.
- Q3. Obtain the initial solution by VAM and optimal solution by MODI method for the transportation problem shown below :

		A	В	С	Supply
	W1	5	4	6	65
	W2	7	4	7	42
Demand	W3	8	6	7	43

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Q4. Five machine are to be located in the machine shop. There are five possible locations in which the machine can be located. C_{ij} the cost of placing *i* in place *j* is given in the table below.

Place							
		1	2	3	4	5	
	1	15	10	25	25	10	
	2	1	8	10	20	2	
Machine	3	8	9	17	20	10	
	4	14	10	25	27	15	
	5	10	8	25	27	12	

It is required to place the machines at suitable place so as to minimize the total cost.

- a) Formulate an L.P. model to find an optimal assignment.
- b) Solve the problem by assignment technique of L.P.
- Q5. Consider the following table :

Activity	Predecessor		Times in Weeks	
	Activity	t ₀	t _m	t _p
А	-	2	3	10
В	- ~	2	3	4
С	A	1	2	3
D	A	4	6	14
Е	В	4	5	12
F	С	3	4	5
G	D,E	1	1	7

- a) Draw the network diagram path.
- b) Find the critical path and variance of each event.
- c) What is the probability that the project will be completed in 16 weeks?
- Q6. a) What is dynamic programming? Write step by step procedure to solve a general problem by D.P.
 - b) Write the algorithm for Fibonacci search method.

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Q7. Solve the following game by the principle of dominance :

	,						
		Ι	II	III	IV	V	VI
	1	4	2	0	2	1	1
	2	4	3	1	3	2	2
Player A	3	4	3	7	-1	1	2
	4	4	3	4	-5	2	2
	5	4	3	3	-2	2	2

Plaver B

Q8. Find the minimum of the function using the Newton-Raphson method with the starting point $\lambda 1 = 0.1$. Use $\varepsilon = 0.01$ for checking the convergence.



NOTE : Disclosure of identity by writing mobile number or making passing request on any page of Answer sheet will lead to UMC case against the Student.