

Seat No.	
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B.E. (Civil) (Part - IV) (Semester - VIII) Examination, April - 2016**OPTIMIZATION TECHNIQUES (Revised) (Elective - III)****Sub. Code : 49413**

Day and Date : Tuesday, 26 - 04 - 2016

Total Marks : 100

Time : 03.00 p.m. to 06.00 p.m.

- Instructions :
- 1) Q. No. 4 and 8 are compulsory.
 - 2) Out of remaining attempt ANY TWO questions from EACH SECTION.
 - 3) Figures to the right indicate full marks.

SECTION - I

- Q1)** a) Explain the significance of various Optimization Techniques in Civil Engineering. [5]
- b) Explain step by step how will you solve the Linear Programming Problem by Simplex Method. [6]
- c) What is the significance of Duality Theory? [5]

- Q2)** a) Determine the initial basic feasible solution for the following Transportation problem by Vogel's Approximation method. State the corresponding cost. [10]

	D1	D2	D3	Supply
S1	16	17	14	15
S2	13	15	17	20
S3	15	14	11	10
S4	10	16	12	25
Demand	25	15	20	

P.T.O.

- b) Solve the following Assignment problem to determine the minimum duration in days. [6]

		Jobs			
		I	II	III	IV
Workers	A	15	18	14	16
	B	16	15	17	14
	C	20	19	18	16
	D	16	15	15	14

- Q3) a) Describe in brief the process of Decision Making. [8]
- b) What is Two-Person-Zero-Sum Game? Solve the following game and suggest the strategies of the players. Also, state the value of Game. [8]

		Player B			
		6	3	4	8
Player A	3	3	1	2	4
	6	6	5	6	7
	3	3	2	4	1
	6	6	3	4	8

- Q4) Write short notes on: [18]
- a) Big M method
 - b) Sensitivity Analysis
 - c) Decision Tree technique

SECTION - II

- Q5)** a) What do you know about Deterministic Inventory models? [4]
b) Following data pertains to certain construction project:
i) Annual requirement of certain items = 30,000 units
ii) Cost of placing order = Rs. 150
iii) Inventory carrying cost = 11%
iv) Price per unit = Rs. 90
v) Discount = 2% for 5000 units

Determine the Economic Order Quantity. Also, state whether to accept the discount. [12]

- Q6)** a) What do you know about Monte Carlo Simulation? [8]
b) Describe in brief the basic structure of Queueing model. [8].

- Q7)** a) What do you know about Dynamic Programming Problem? State its significance in Civil Engineering. [8]
b) Explain with suitable example the Concave Function and Convex Function with reference to Non-Linear Programming.

State whether following function is Convex or Concave:

- i) $f(x) = -8x^2$
ii) $f(x) = 12x^2$ [8]

- Q8)** Write short notes on ANY THREE: [18]
a) Forecasting Techniques
b) Cutting Plane method for Integer Programming
c) Bellman's Principle of Optimality
d) Applications of Queueing Theory in Civil Engineering

