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Total No. of Pages : 03

Total No. of Questions : 09

B.Tech. (ME) (2011 Onwards E-II) (Sem.-7,8)

OPTIMIZATION TECHNIQUES

Subject Code : DE/PE-3.2

M.Code : 72018

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A**1. Answer briefly :**

- (a) Write two comprehensive definitions of OR.
- (b) Explain balking, reneging & jockeying in context to queuing.
- (c) Explain non-degenerate basic feasible solution of an LPP
- (d) What are the reasons for using Simulation?
- (e) Explain assumptions of continuity & certainty in LP models.
- (f) Explain group replacement policy.
- (g) Describe the costs relevant for crashing of networks.
- (h) What do you mean by pure & mixed strategies?
- (i) Differentiate between Deterministic & Probabilistic models.
- (j) Define key row & key column in simplex method.

SECTION-B

2. Explain role of OR in solving Industrial problems.
3. Explain Bellman's principle of optimality.
4. Explain four different types of floats.
5. **Solve using Big M :**

$$\text{Minimise } Z = 4a + 2b$$

$$3a + 1b \geq 27; -1a - 1b \leq -21; 1a + 2b \geq 30; \text{ and both } a \text{ and } b \text{ are } \geq 0.$$

6. Solve the transportation problem :

(Cost in Rs. per unit)
Destinations

Origin	A	B	C	Available capacity	Row number u_r
X	2	1	2	20	
Y	3	4	1	40	
Requirements	20	15	25	60	
Column element v_j					

SECTION-C

7. What is dynamic programming & what type of problems can be solved by it? State "Principle of Optimality" in dynamic programming & give a mathematical formulation of a dynamic programming problem?
8. Write a note on **Any Two** of the following :
 - a) EOQ,
 - b) Replacement policy,
 - c) Non-Linear Programming.

9. Steps involved in executing an order for a large engine generator set are given below in a jumbled manner. Arrange them in a logical sequence, draw a PERT network and find the expected execution time period.

Activities (not in logical order)	Time in weeks		
	t_o	t_L	t_P
Order and receive engine	1	2	3
Prepare assembly drawings	1	1	1
Receive and study order	1	2	3
Apply and receive import license for generator	3	5	7
Order and receive generator	2	3	5
Study enquiry for engine generator set	1	2	3
Fabricate switch board	2	3	5
Import engine	1	1	1
Assemble engine generator	1	2	3
Submit quotation with drawing and full	1	2	3
Prepare base and completing	2	3	4
Import generator	1	1	1
Order and receive meters, switch gears for switch board	2	3	4
Test assembly	1	1	1

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.