

**Bharati Vidyapeeth
(Deemed to be University), Pune**

School of Distance Education

Name of the Assignment Setter: Dr. Pramod Kadam

Course: MCA **Class:** **Semester:** V

Subject: (502) Optimization Techniques

Q.1) Attempt **ANY ONE** of the Following (1000 Words) **(10)**

a) Describe general working of operation research model with their application.

b) Define and Discuss Monte Carlo Simulation model for Inventory module.

Q.2) Attempt **ANY TWO** of the Following **(12)**

a) A small project consisting of eight activities has the following characteristics:

Time – Estimates (in weeks)

Activity	Preceding activity	Most optimistic time (a)	Most likely time (m)	Most Pessimistic time (b)
A	None	2	4	12
B	None	10	12	26
C	A	8	9	10
D	A	10	15	20
E	A	7	7.5	11
F	B,C	9	9	9
G	D	3	3.5	7
H	E,F,G	5	5	5

(i) Draw the PERT network for the project.

(ii) Prepare the activity schedule for the project.

(iii) Determine the critical path.

b) The ICARE Company has three plants located throughout a state with production capacity 50, 75 and 25 gallons. Each day the firm must furnish its four retail shops R1, R2, R3, & R4 with at least 20, 20, 50, and 60 gallons respectively. The transportation costs (in Rs.) are given below.

Company	Retail				Supply
	R1	R2	R3	R4	
P1	3	5	7	6	50
P2	2	5	8	2	75
P3	3	6	9	2	25
Demand	20	20	50	60	

		The economic problem is to distribute the available product to different retail shops in such a way so that the total transportation cost is minimum?																								
	c)	<p>In a computer centre after studying carefully the three expert programmes, the head of computer centre, estimates the computer time in minutes required by the experts for the application programmes as follows:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2"></th> <th colspan="3"><i>Programmes</i></th> </tr> <tr> <th colspan="2"></th> <th><i>A</i></th> <th><i>B</i></th> <th><i>C</i></th> </tr> </thead> <tbody> <tr> <th rowspan="3">Programmes</th> <th>1.</th> <td>120</td> <td>100</td> <td>80</td> </tr> <tr> <th>2.</th> <td>80</td> <td>90</td> <td>110</td> </tr> <tr> <th>3.</th> <td>110</td> <td>140</td> <td>120</td> </tr> </tbody> </table> <p>Assign the programmers to the programmes in such a way that the total computer time is minimum.</p>			<i>Programmes</i>					<i>A</i>	<i>B</i>	<i>C</i>	Programmes	1.	120	100	80	2.	80	90	110	3.	110	140	120	
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	2.	80	90	110																						
	3.	110	140	120																						
	d)	Solve the following Linear Programming Problems graphically: Minimise $Z = -3x + 4y$ subject to $x + 2y \leq 8$, $3x + 2y \leq 12$, $x \geq 0$, $y \geq 0$.																								
Q.3)	Write Short Notes on (ANY TWO)		(08)																							
	a)	Travelling Salesman Problem																								
	b)	Critical Path Analysis																								
	c)	Hurwitz Criterion																								
	d)	Expected Opportunity Loss																								
