OPERATIONS RESEARCH (602)
B.B.A. VI Sem.

U N I T – I

Q. 1 : What do you mean by Operation Research? Explain Scope of Operation Research.
Q. 2 : What is the Role of Operations Research in Decision Making?
Q. 3 : Mention Some of the Areas of Applications of Operations Research.
Q. 4 : What are the Limitations of Operations Research?
Q. 5 : Operations Research Provide a tool for Scientific Analysis, Discuss?

U N I T – II

Q. 1 : What do you mean by Linear Programming and explain its characteristics?
Q. 2 : Discuss the Advantages and Limitations of Linear Programming?
Q. 3 : Solve the following L.P.P. by Graphical Method :-

Minimize $z = 3x + 2y$
Subject to $x + y \leq 5$
$3x + y \geq 6$
$x + 4y \geq 4$

Q. 4 : A former grows potatoes and barley its requirements of different inputs per acre for each commodity as well as the total availability of the inputs is indicated in the table blow :-

Input	Requirements per acre of		Amount Available
	Potatoes	Barley	
Land	1	1	100 acre
Labour	11	2	990 man hours
Equipments	3	5	480 machine hours

If the former gets a profit of Rs. 760/- per acre on potatoes and Rs. 150 per acre an barley formulate this problem as linear programming problem and solve it using Graphical Method.

Q. 5 : Solve the following problem by simplex method :-

Maximize $z = 4x_1 + 5x_2 - 3x_3$
Subject to $x_1 + x_2 + x_3 = 10$
$x_1 - x_2 \geq 1$
$2x1 + 3x_2 + x_3 \leq 40$
$x_1, x_2, x_3 \geq 0$

U N I T – III

Q. 1 : What do you mean by Basic Feasible Solution of Transportation Problem?
Q. 2 : Explain the following for finding initial basic :-

(A) North West Corner Method (B) Least Cost Method
(C) Vogel's Approximation Method (D) Raw Minimum Method
(E) Column Minima Method

Q. 3 : Determine the Optimal Solution of the following Transportation Problem using Vam for initial BFS :-

Plant/Market	W_1	W_2	W_3	W_4	Availability
F_1	11	20	7	8	50
F_2	21	16	10	12	40
F_3	8	12	18	9	70
Requirement	30	25	35	40	

Q. 4 : Following is the initial feasible solution calculated by North West Corner Method and apply Modi Method to test its Optimality.

From/To	Project A	Project B	Project C	Plant Capacity
Plant w	4	8	8	56
Plant x	16	24	16	82
Plant y	8	16	24	77
Total Required	72	102	41	215

Q. 5 : A company has three factories F1, F_2 and F_3 which supply warehouses at w_1, w_2 and w_3. Monthly factory capacities are 120 units, 80 units and 80 units respectively.

Monthly warehouse requirements are 150 units, 80 units and 50 units respectively. Unit Transportation Costs (In Rs.) are as follows :-

WAREHOUSE

	From/To	W_1	W_2	W_3	Capacity
Factory	F1	8	8	15	120
	F2	15	10	17	80
	F3	3	9	10	80
Requirement		150	80	50	280

U N I T – IV

Q. 1 : What is Decision Theory? Explain various Methods of Decision Making under uncertainty with use of probability.

Q. 2 : Discuss the difference b/w Decision Making under Risk and under Certainty in Decision Theory.

Q. 3 : Which alternative will you choose under the (1) Maximax (2) Maximum and (3) Minimax Regret criteria based on the following pay off (profit) matrix.

PAY OF MATRIX

State of Nature	Acts			
	A	B	C	D
P	5	10	18	25
Q	8	7	8	23
R	21	18	12	21
S	30	22	19	15

Q. 4 : An Ice-cream retailer buy ice-cream at a cost of Rs. 5 per cup and sells it for Rs. 8 per cup. Any remaining unsold at the end of the day can be disposed of at a salvage price of Rs. 2 per cup. Past sales have ranged between 15 and 18 cups per day. It is hoped that same trend will continue in near future find expected monetary value (EMV) if the sales history has the following probabilities:-

Demand	:	15	16	17	18
Probability	:	0.10	0.20	0.40	0.30

Q. 5 : The parker flower shop promises its customers delivery within four hours on all flower order. All flowers are purchased on the prior day and delivered to parker by 8:00 AM the next morning parker's daily demand for roses is as follows:-

Dozens of Roses	7	8	9	10
Probability	0.10	0.20	0.40	0.3

Parker purchases roses for Rs. 10/- per dozen and sells them for Rs. 30/-. All unsold roses are donated to a local hospital. How many dozens of roses should parker order each evening to maximize its profits? What is the Optimum expected profits.

U N I T – V

Q. 1 : What do you understand by Statistical Quality Control?

Q. 2 : What is the difference between the random causes and assignable causes?

Q. 3 : Several samples of 16 items each were taken from the output of a process and a critical dimension was measured. The true mean and standard deviation were 100 mm and 10 mm respectively on the basis of the following control factors, determine the central line and control of X-chart, R-chart and F-chart.

n	d2	D_2	D_1	C_2
16	3.532	5.779	1.285	0.952

Q. 4 : Following table gives the number of defect noticed in seven carpets which were regarded as standard. Contract the control chart for number of defects:-

Serial number of Carpets	1	2	3	4	5	6	7
No. of Defects	5	4	3	3	5	2	6

Q. 5 : The following data refer to certain defects found at inspection of first 5 samples of size 100 obtain upper and lower control limits for percentage defectives in samples of 100 :-

Sample No.	:	1	2	3	4	5	Total
No. of defectives	:	3	1	2	7	2	15

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