

Q.1. Attempt any three.

- A novice invested Rs. 756 in buying the shares of a company whose market value was Rs. 75 per share. Find out how many shares he got, if the brokerage was 0.8%.
- Sanjay bought 350 shares of a company at the market value of Rs. 590 each. If the company declared a one is to one bonus share and if the market price of shares after the bonus is Rs. 320 per share, find the number of shares held by Sanjay and his asset as well as gain after the bonus.
- Sagar invested RS.55,350 in a mutual fund at NAV of Rs.450 with entry load at 2.5%. before receiving any dividend he sold all units at NAV of Rs.455 with exit load at 1%. Find his gain /loss in the above transaction.
- Find the average unit cost occurred to each of the investor using the rupee cost average method and compare with arithmetic mean of the prices. Investment is Rs. 3000 p.m. for 4 months with NAV's at Rs. 120, 110, 130, 125 respectively. The entry load being 2.25%

Q.2. Attempt any three.

- How many different numbers of 4 digits can be made out of the digits 0,1,2,3,4,5 such that i) no digit is repeated ii) repetition of digits is allowed.
- Ten samples of food items of which four are adulterated are produced for inspection. If the inspector is supposed to pick up any three samples for inspection, find how many selections will have: i) no adult rated sample ii) exactly 2 adulterated samples iii) at most 1 adulterated sample iv) atleast 2 adulterated samples.
- A diet for a growing child must contain atleast 4000 units of vitamins, 50 units of minerals and 1400 calories. Two foods A and B are available such that one unit of A contains 200 units of vitamins, 1 unit of minerals and 40 calories, and one unit of B contains 100 units of vitamins, 2 minerals and again 40 calories. Cost of the foods A and B are Rs. 70 and Rs. 80. Construct the problem to minimize the cost.
- Solve the linear programming problem  
 Minimize  $z = 5x + 2y$   
 Subject to  $10x + 2y \geq 20$   
 $5x + 5y \geq 30$   
 $x \geq 0; y \geq 0$

Q.3. Attempt any three.

- In a college having 60% boys, the average of passing amongst boys was 75% and that of girls was 80%. Find the combined average of passing for all the students.
- Find the  $Q_1, D_3, P_{60}$  for the following data.

Age (yrs)	15-25	25-35	35-45	45-55	55-65
No of persons	20	18	32	18	12

- Find the mean and the standard deviation

Marks (x)	0	1	2	3	4	5
No of students (f)	0	11	12	25	30	22

- Calculate the mean deviation from the mean. The wages in rupees per day of 500 employees of a company are tabulated below.

Wages in Rs	0-50	50-100	100-150	150-200	200-250	250-300
No of employees	10	70	80	100	150	90





Q.4. Attempt any three.

- a) From a well shuffled pack of 52 cards, 2 cards are drawn at random. Find the probability that : (i) both are kings (ii) one is king and other is queen. (iii) both are red (iv) both are face cards.
- b) An organization consists of 25 members including 4 doctors. A committee of 4 is formed at random. Find the probability that the committee contains (i) no doctors (ii) exactly two doctors (iii) atleast 3 doctors.
- c) The probability that a person stopping at a petrol pump will ask for petrol is 0.80, the probability that he will ask for water is 0.70 and the probability that he will ask for the both is 0.65. Find the probability that a person stopping at this petrol pump will ask for (i) either petrol or water (ii) neither petrol nor water.
- d) For the probability distribution given below find  $E(x)$  and  $V(x)$

$X$	8	12	16	20	24
$P(x)$	$1/8$	$1/6$	$3/8$	$k$	$k/3$

Q.5. Attempt any three.

- a) The following matrix gives the pay off in Rupees of different strategies (acts)  $S_1, S_2, S_3$  against different events  $E_1, E_2, E_3, E_4$

Strategy	Events			
	$E_1$	$E_2$	$E_3$	$E_4$
$S_1$	8000	-500	10000	15000
$S_2$	12000	7000	500	0
$S_3$	13000	10000	-1000	2000

What decision can be taken using (i) maximax (ii) maximini (iii) laplace criteria.

- b) Find the best decision using EMV criteria.

State of nature	probability	Alternatives		
		$A_1$	$A_2$	$A_3$
$E_1$	0.4	40	30	10
$E_2$	0.2	50	60	40
$E_3$	0.4	20	40	60

- c) An auto company is trying to decide the size of the plant to be built in Gujarat. Three alternatives of annual capacity (i) 10000 units (ii) 20000 units (iii) 50000 units are under consideration. Demand for the product is known with certainty but the management has estimated the probability of different levels of demand and profit for each size of plant at different levels of demand are as follows:

Level of demand	probability	Profit (in lakhs) for different actions capacity		
		10000	20000	50000
High	0.45	3	9	10
Moderate	0.25	1	7	5
Low	0.30	2	14	22

Construct the decision tree also state which plant would you suggest for management.

- d) Which are the criteria that are available for decision making under uncertainty. Also write the steps for calculating these criterions.