



Note: All questions are compulsory

All questions carry equal marks

Figures to right indicate maximum marks allotted to the sub questions.

Use of a simple calculator is allowed

Graph paper will be supplied on request

Q.1. Attempt any Three of the following:

(15)

- The gain on buying the shares of the market value Rs. 530 each and then selling those within a month's time at Rs. 640 each is Rs. 4,283. If the brokerage is charged at 0.25% and assuming that no other benefits like dividend etc are received, while holding the shares find the number of shares traded.
- Two companies A & B have share with face value of Rs. 10 each, but their market prices are Rs. 45 and Rs. 36 per share respectively. If the dividend distributed by the companies are 18% and 15%, find out which company is a better W.R.T. dividend.
- An investor bought 200 units of a mutual fund with NAV Rs. 460 and entry load of 2.25% After receiving the dividend at 50%, he sold the units at the NAV of Rs. 476 and exit load at 0.5%. Find the amount invested, dividend received, amount received from sale and the gain/loss if any.
- A sum of Rs.10, 000 was invested in a mutual fund at NAV of Rs. 160 and entry load 2%. The company declared two dividends of 50% each, within a year. The units were then sold at NAV of Rs. 188 and exit load of 0.5%. Find the gain and the rate of return.

Q.2. Attempt any Three of the following:

(15)

- From 4 professors and 6 students, a committee of 3 is to be formed. In how many ways, this can be done if the committee contains: i) at least 2 professors ii) at most 1 professor iii) exactly 1 professor.
- Find n for the following:
 - $2n p_3 = 36$ ($n p_2$)
 - $5 (n p_4) = 3 (n+1 p_4)$
- A factory manufactures two articles X and Y. To manufacture the article X, a certain machine has to work for 2.5 hours and in addition, a craftsman has to work for 1.5 hrs. To manufacture the article Y, the machine has to work for 1.5hrs & in addition, the craftsman has to work for 2 hrs. In a week, the factory can avail of 80 hours of machine time and 70 hours of craftsman's time. The profit per article X is Rs. 100 & per article Y is Rs. 150. Construct the problem to maximise the profit.
- Solve the L.P.P graphically

Minimize $z = 2x + 4y$

Subject to $2x + y \geq 2$

$x + 3y \geq 3$

$3x + 4y \geq 6$

$x, y \geq 0$

Q.3. Attempt any Three of the following:

- a) Three students are short-listed for the best student's award. Their performance is listed below, with appropriate weightage in each category of assessment. State the winner of the award.

Basis of Assessment	weightage	candidates		
		A	B	C
Result	07	87	90	88
Sports	01	03	0	02
Regularity	02	04	05	03

- b) Find the mode for the following distribution

C.I.	10-20	20-30	30-40	40-50
f	2	5	6	3

- c) Find the quartiles for the given data.

Height (cms)	150-153	153-156	156-159	159-162	162-165	165-168
No. of students	13	14	15	18	16	13

- d) Calculate the mean and standard deviation of the following frequency distribution.

Age in Years	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Persons	18	16	15	12	10	07	03	01

Q.4 Attempt any Three of the following:

- a) A committee of 4 is to be formed from a group of 8 boys & 4 girls. Find the probability that the committee contains: i) all boys ii) at least 1 girl.
- b) The probability that the certain new film will get an award for its story is 0.23, the probability that it will get an award for its music is 0.15, while the probability that it will get an award for both is Rs. 0.07 what is the probability that it will get an award for i) at least one of the two
ii) none of these.
- c) The chances of three independent companies opening new branch are $\frac{1}{2}$, $\frac{1}{3}$ & $\frac{1}{5}$ respectively. What is the chance that all three companies open a new branch
- d) For the probability mass function of random variable x given below, find K & E(x)

x	1	2	3	4
P(x)	0.2	0.4	0.1	k

Q.5 Attempt any Three of the following:

- a) For the following probability distribution

x	1	2	3	4	5	6
P(x)	$\frac{2}{10}$	$\frac{3}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{2}{10}$	$\frac{1}{10}$

- Find
- $P(x > 4)$
 - $P(x \geq 3)$
 - $P(2 < x < 5)$

(15)

- b) The following pay-offs and 3 acts A_1, A_2, A_3 & the events E_1, E_2 & E_3 .

State of Nature	Three Acts		
	A_1	A_2	A_3
E_1	125	-100	-125
E_2	400	340	300
E_3	650	740	750

The probabilities of states of nature are 0.1, 0.7, 0.2 respectively. Find the best decision using EMV criteria.

- c) ABC Company is evaluating 4 alternatives on investments whose returns are based on the state of economy.

State	Fair	Good	Great
Prob.	0.2	0.5	0.3

The returns are as follows:

Alternative	Fair	Good	Great
P	1000	3000	6000
Q	500	4500	6800
R	0	5000	8000
S	-4000	6000	8500

Draw a decision tree and determine the expected return for each alternative. Give your decision using EMV.

- d) A card is drawn from a pack of 52 cards. Find the probability that
- It is a heart or a queen.
 - It is a red card or bears a number between & including 3 & 7.
 - It is a diamond or a picture card.
 - It is a king or an ace.
 - It is a black card or a jack.