VCD/ 12/12/23 FYBCOM SEM I MATHEMATICAL AND STATISTICAL TECH-I 3 HRS 100 MARKS

Note: 1) Figures to the right indicate full marks.
2) Use of simple calculator is allowed.

Q.1) Attempt any four from the following: (20)

1) Find a market value of 12% share if Rs. 6400 were invested to purchase share with face value of Rs. 100 and total dividend of Rs. 480 was obtained.
2) Seema invested Rs. 2,08,832 to purchase equity shares of company at market price of Rs. 260 through a brokerage form charging 0.4% brokerage. Find number of shares purchased.
3) Praniti invested Rs. 9945 to purchase share of a company with face value of Rs. 10each, at market price of Rs. 65. She received dividend of 20% as well. Afterwards, shesold these share at market price of Rs. 90. She had to pay brokerage of 2% for both purchase and sales of share. Find her net profit.
4) Mr Kale invest an amount of Rs. 50,000 on 14th Feb, 2021 when NAV was Rs 125.6, with an entry load of 2.5%. Find the number of units purchased. If current NAV is Rs 140.4, find current value of his investment.
5) Nikhil invested Rs 15,000 on 5th of every month for 6 months in Systematic Investment Plan Scheme of a Mutual Fund. The Navy on these dates where RS 42.36, 47.68, 40.25, 49.87, 52.48 and 39.16 respectively. There was same entry load of 2.25% for all these months. Find average price of unit.

Q.2) Attempt any four from the following: (20)

1) Solve: i) ${}^{6}P_3 \times {}^{9}P_5$ ii) ${}^{7}C_2 \times {}^{5}C_4$
2) How many different numbers of 4-digit can be formed using the digits 1,2,3,4,5 such that (a) Repetition of digits is allowed (b) Repetition of digits is not allowed.
3) An organization consists of 2 managers, 5 officers, and 10 clerks. A selection of 4 persons is to be done. Find how many selections will have 1 officer and 3 clerks?
4) A manufacturer produces bulbs and tubes. Each of these must be processed through two machines. M1and M2. A package of bulbs require 1 hour of work on machine M1 and 3 hours of work on M2.A package of tubes require 2 hours on machine M1 and 4 hours machine M2. He earns a profit of Rs. 13.5 per package of bulbs and Rs. 55 per package of tubes. If maximum availability of Machine M1 is 10 hours and that of Machine M2 is 12 hours. Formulate the LPP to maximize the profit.
5) Solve the L.P.P. graphically, Maximize $Z = 5x + 10y$
   Subject to $x + 2y \leq 10 \quad 3x + y \leq 12, \quad x \geq 0, y \geq 0$

Q.3) Attempt any four from the following: (20)

1) Calculate mean for the following data.

Age in years	0-10	10-20	20-30	30-40	40-50	50-60
Number of patients	6	8	11	10	9	6

2) Calculate standard deviation and coefficient of variation for the following data.

Income in 00 Rs	1-3	3-5	5-7	7-9	9-11
No. of salesman	2	5	7	4	2

3) Calculate quartile deviation and coefficient of quartile deviation for the following data.

Daily Wages in Rs	100	200	300	400	500	600
No. of employees	4	7	15	8	7	2

4) Draw cumulative frequency curve and hence locate median graphically

Daily wages in '00' Rs	3-4	4-5	5-6	6-7	7-8	8-9	9-10
No. of workers	1	3	11	21	43	32	9

5) Write Merits & Demerits of Range.

Q.4) Attempt any four from the following: (20)

1) Three unbiased coins are tossed. Find the probability of getting (a) exactly 2 heads (b)no tail

2) A card is drawn from a pack of well shuffled 52 playing cards. Find the probability that the card drawn is (a) a black card (b) a heart card

3) For the following probability distribution function, find $k, P(x > 3), P(x \leq 4)$.

X	1	2	3	4	5
P(X)	2k	k	0.1	k	0.1

4) Find mean and variance for the following:

X	1	2	3	4	5	6
P(X)	0.1	0.15	0.2	0.3	0.15	0.1

5) Explain: i) Random Variable ii) Discrete Random Variable iii) Complimentary Event

Q.5) Attempt any four from the following: (20)

1) Explain briefly decision making under uncertainty.

2) Solve the given decision problem using Minimax regret

Courses of Action	States of Nature		
	S_1	S_2	S_3
A_1	10	18	25
A_2	12	24	30
A_3	25	10	20

3) Given the pay-off matrix, solve the decision using EMV criterion.

Courses of Action	States of Nature		
	S_1	S_2	S_3
A_1	400	500	800
A_2	200	0	100
A_3	350	450	600
Probability	0.5	0.2	0.3

4) Given the pay-off matrix, solve the decision using EOL criterion.

Courses of Action	States of Nature		
	S_1	S_2	S_3
A_1	100	300	150
A_2	0	50	30
A_3	120	160	200
Probability	0.4	0.5	0.1

5) Draw a decision tree for the given pay-off table.

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	S_1	S_2	S_3
A_1	34	20	18
A_2	14	16	12
Probability	0.2	0.3	0.5

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