Q.P. Code:000166

[Time:3.00 Hrs.] **[Marks: 100]**

Please check whether you have got the right question paper.

N.B:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Use of non-programmable simple calculator is allowed.
4. Graph paper will be provided on demand of student.
5. Both the sections written on same answer sheet.

Section-I

Q.1 Attempt any Four of the following:

a) Aditi invested Rs. 19,890 /- to purchase shares of a company with face value of Rs.10/- each, at market price of Rs. 130/-. She received dividend of 20 % as well Afterwards, she sold these shares at market price of Rs. 180/-. She had to pay brokerage of 2 % for both purchase and sales of shares. Find her net profit. **5**

b) Mrs. Sheetal invested Rs. 20,000 /- in Rs. 100/- shares of company A at the rate of Rs. 125/- per share. He received 10 % dividend on these shares. Mr. Subu also invested Rs. 24,000/- in Rs. 10/- shares of company B at Rs.12/- per share and he received 15 % dividend. Which investment is more beneficial? **5**

c) Mr. Deore invested Rs. 25,000/- to purchase 2,500 units of ICICI MF - B plan on 4th April 2007. He decided to sell the units on 14th Nov. 2007 at NAV of Rs. 16.4 /-. The exit load was 2.5 %. Find his profit (Calculations are up to 2 decimal points). **5**

d) If NAV was Rs. 72/- at the end of the year, with 12.5 % increase during the year, find NAV at the beginning of the year. **5**

e) Meena Rs. 20,000/- on 2nd of every month for 5 months in a SIP of a mutual fund, with NAVs as Rs. 53.12, Rs. 56.26, Rs. 48.86, Rs.50.44 and Rs. 54.62 respectively. The entry load was 2.25 % throughout this period. Find average price, including the entry load, using the Rupee-cost -Averaging method and compare it with Arithmetic mean of prices. (Calculate up to 2 decimal points) **5**

Q.2 Attempt any Four of the following:

a) In how many ways can 3 boys and 4 girls be seated for a group photograph if (i) no two boy seats together, (ii) all boys seat together? **5**

b) How many 3-digit numbers can be formed with the help of digits 1, 2, 3, 7, 8 and 9 if repetition of digits is not allowed? How many of them are **i)** Even numbers? **ii)** Greater than 700? **5**

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c) There are 15 professors including the principal and the vice principal in a college. A committee of 4 is to be formed from amongst them. Find the number of ways in which this can be done, so as to include, (i). The principal but not the vice-principal, (ii). Neither the principal nor the vice-principal. **5**

d) Two different kinds of food A and B are to be considered to form a weekly diet. The minimum weekly requirements for fats, carbohydrates and proteins are 12, 30 and 20 units respectively. One Kg. of food A has 2, 16, and 4 units respectively of these ingredients and one Kg. of food B has 6, 4 and 3 units respectively. If the cost per Kg. of food A is Rs.75, per Kg. of food B is Rs.80. Construct the problem to minimize the cost. **5**

e) Maximize, $z = 50x_1 + 70x_2$ Subject to, $x_1 + x_2 \leq 8$, $3x_1 + x_2 \leq 12$, $x_1 \geq 0$, $x_2 \geq 0$. **5**

Section-II

Q.3 Attempt any Four of the following:

a) Write merit and demerit of mean deviation. **5**

b) Calculate the Mode for the following data regarding tips given by customers to a waiter in a day. **5**

Amount in Rs.	10-20	20-30	30-40	40-50	50-60
No. of persons	50	150	175	100	25

c) The mean wage of 100 workers in a factory running two shifts of 60 and 40 workers respectively is Rs. 38. The mean wage of 60 workers working in the morning shift is Rs. 40. Find the mean wage of the 40 workers working in the evening shift. **5**

d) The following table shows the weight-wise distribution of students in a hostel. Draw a less then Ogive for the following data and find median graphically. **5**

Weight (Kg.)	40-45	45-50	50-55	55-60	60-65	65-70	70-75
No. of persons	10	15	20	32	15	10	8

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e) The following data are available for two groups of workers in a factory. Which group is more consistent? **5**

	Group I	Group II
Number of workers	60	90
Average daily wages (Rs.)	120	115
Standard deviation (Rs.)	7	8

Q.4 Attempt any Four of the following:

a) Explain the following term with example: **5**
i) Mutually exclusive event **ii)** Complement of an event.

b) A box contains 5 Red and 4 Green balls. Two balls are drawn at random from the box, find the probability that **i)** Both are of same colour **ii)** only red balls are drawn. **5**

c) Two students A and B are solving a problem on Mathematics independently. Their chances of solving the problem are 1/2 and 1/3 respectively. Find the probability that, i) the problem is solved. ii) it is solved by only one of them. **5**

d) Find the mean and variance for the following probability distribution. **5**

X	-5	0	5	10	15
P (x)	1/3	1/9	1/3	1/9	1/9

e) For the following probability distribution. **5**

X	-1	0	1	2	3	4
P(x)	0.2	0.15	0.25	k	0.05	0.35

Find $(\mathbf{i})\ k, (\mathbf{ii}) P(x \geq 2),\ (\mathbf{iii})\ P(-1 < x < 2),\ (\mathbf{iv}) P(0 \leq x < 4)$.

Q.5 Attempt any Four of the following:

a) Explain the element of a decision-making problem. **5**

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b) From the following pay off table. Determine the best possible act by using. (i). Maximin criterion, (ii). Maximax criterion, (iii). Laplace criterion. **5**

Event / Act	E1	E2	E3	E4
A1	21	18	22	19
A2	-5	18	19	20
A3	20	-4	14	21

c) From the following pay-off table decide on the best investment alternative for an entrepreneur calculating expected opportunity loss (EOL). **5**

State of economy	probability	Investment alternative		
		Mall	college	Discothe que
Fair	0.25	20	30	35
Good	0.40	35	45	40
Excellent	0.35	55	50	40

d) Draw decision tree for the following pay of table & determine the best possible act from it. **5**

Event / Act	S1	S2	S3
A1	29	32	30
A2	16	40	42
A3	0	24	48
Probability	0.25	0.45	0.3

e) A newspaper boy has following probability distribution of selling a fashion magazine. **5**

No. of copies sold	80	100	120
Probability	0.3	0.5	0.2

Each magazine cost him 8 and is sold at 20. The newspaper boy cannot return the unsold copies. Draw a pay-off table and determine the optimal act using EMV criterion.

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