Mathematics & Statistics

Assignment: Shares and Mutual Funds (Unit 1)

1) A person sold 400 shares at Rs. 55 each paying 0.5% brokerage. What is net amount received by him.
2) Ravi sold some shares at a M.V. of Rs 120 each and paid 0.1% brokerage. He received a net amount of Rs. 47952. Find the number of shares sold.
3) A person purchased 300 shares of a company of face value Rs. 10 at M.V. of Rs. 180 per share. Later he sold all the shares at Rs. 200 per share. Find his gain and his % profit.
4) Lily purchased 560 shares of market price Rs. 380 per share and afterwards sold them with a market price of Rs. 450 per share. Find the purchase and sales amount and the profit she gained.
5) The market prices of shares with face values Rs.100 each, of two companies are Rs. 350 and Rs. 440 per share. If they gave dividends of 28% and 33% respectively, find out which company is better with respect to dividend.
6) Two companies A and B have shares with face value of Rs. 10 each, but their market prices are Rs. 45 and Rs. 36 per share respectively. If the dividends given by these companies are 350% and 540% , find out which company is better w.r.t. dividends.
7) Seeta invested Rs.20, 000 in a M.F. with NAV Rs. 15.75. Find the number of units acquired by her if (i) there is no entry load (ii) the entry load is 2%.
8) Pankaj invested Rs. 30,000 in a M.F. when the NAV was Rs. 25.54 with an entry load 2.25%. Calculate the no. of units.
9) An investor invested Rs. 4000 on the 2nd of every month for 4 months in a SIP of a M.F. The NAV on these dates was Rs. 28.25, Rs. 35.57, Rs. 38.45 and Rs. 44.32 respectively. There was no entry load for all these months. Find the ave. acquisition cost per unit. Also find the Arithmetic Mean of the prices of the units and comment.
10) Rubi invested Rs. 5000 per month in an SIP for four consecutive months when the NAV are Rs. 12.42, Rs. 13.87, Rs. 13.34, Rs. 12.88 respectively. Find the ave. acquisition cost per unit. Also find the Arithmetic Mean of the prices of the units and comment.

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Assignment: L.P.P. and Permutation and Combination (Unit 2)

1) Solve the L.P.P. graphically:

i) Max $Z = 3x+4y$
Subject to
$3x+2y \leq 12$
$x+2y \leq 8$
$x, y \geq 0$

ii) Min $Z = x+7y$
Subject to
$4x+y \geq 4$
$x+3y \geq 3$
$x, y \geq 0$

iii) Max $Z = 7x+6y$
Subject to
$3x+4y \leq 12$
$2x+y \leq 8$
$x, y \geq 0$

iv) Min $Z = 15x+13y$
Subject to
$4y+3y \geq 360$
$x+2y \geq 100$
$x, y \geq 0$

2) Frame the following L.P.P.

i) A carpenter has 8 units of wood and 12 units of board for making chairs and tables. A chair requires 2 units of wood and 2 units of board, whereas a table requires 1 unit of wood and 3 units of board. If he sells one chair, he gets a profit of Rs. 300, and if he sells one table his profit is Rs. 100.

ii) Satya wants to decorate her X'mas tree for which she needs at least 20 big stars and at least 30 small stars. The shopkeeper sells stars in two forms. viz boxes and cards. Each box contains 10 big and 5 small stars and each card contains 2 big and 5 small stars. Box costs is Rs. 25 and card costs is Rs. 10 each.

3) Evaluate the following

i) $6!$ ii) ${}^{6}P_{2}$ iii) ${}^{6}C_{2}$ iv) ${}^{52}C_{2}$ v) ${}^{100}P_{4}$

4) i) In how many different ways can be the letter of the word 'SUNDAY' be arranged? Also find how many of these begin with A.

ii) There are 10 questions in a question paper. In how many different ways can a students attempt 7 questions from the paper?

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Assignment: Measures of Central Tendency & Measures of Dispersion (Unit3)

1) Calculate the mean and mode for the following data.

Age in years	10-20	20-30	30-40	40-50	50-60
No. of persons	6	11	20	15	8

2) Calculate the mean and mode for the following data.

Marks	0-20	20-40	40-60	60-80	80-100
No. of students	23	37	50	24	16

3) Calculate M, Q_1, Q_3, Q.D. and coefficient of Q.D.

C.I.	0-20	20-40	40-60	60-80	80-100
Frequency	15	25	30	20	10

4) Calculate M, Q_1, Q_3, Q.D. and coefficient of Q.D.

C.I.	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	6	8	11	10	9	6

5) Calculate the mean and S.D. for the following data.

Age in years	10	20	30	40	5
No. of persons	6	11	20	15	8

6) Calculate the mean and S.D. for the following data

x	0	2	4	6	8	10
f	16	14	13	17	15	5

7) Calculate the combine mean of the two groups for the following data and hence check which group is more consistent.

	Group I	Group II
Number	100	200
Mean	50	45
S.D.	5	3

8) Calculate the combine mean of the two groups for the following data and hence check which group is more variable.

	Male	Female
Number	40	60
Mean	60	70
S.D.	8	5

9) Explain the meaning of dispersion. What are the imp[ortant measure of dispersion?

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Assignment: Probability Theory and Random Variable (Unit4)

1) One card is drawn from a well-shuffled pack of cards. What is the probability that it is (i) red (ii) diamond (iii) king (iv) ace (v) face card (vi) number card.
2) Two dice are thrown. Find the probability that the sum of the numbers on the uppermost faces is (i) 8 (ii) divisible by 8 (iii) even number (iv) greater than 10.
3) The following table shows a Probability Distribution of a Random Variable X , find E(x) and V(x)

X	1	2	3	4	5
P(x)	0.1	0.25	0.25	0.2	0.2

4) The following table shows a Probability Distribution of a Random Variable X , find k, $P(x \leq 2)$, $P(X>4)$

X	1	2	3	4	5
P(x)	0.1	0.25	k	0.2	0.2

5) Define the following terms with examples
   i) Probability of an event ii) Mutually Exclusive events
   ii) Exhaustive events iv) Sample space v) Complementary events vi) Independent events

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Assignment: Decision Theory (Unit 5)

1) The following is demand distribution of a certain product:

No. of units demanded	8	9	10
Probability	0.35	0.40	0.25

The product is sold at Rs. 100 per unit with cost price Rs. 70 per unit. The unit not sold is wasted. Prepare a payoff table.

2) Construct a payoff table for the following information.

A product can be sold at Rs. 40 with cost price of Rs. 30 per unit. Its demand has the following probability distribution.

No. of units demanded	5	6	7	8
Probability	0.2	0.25	0.3	0.25

3) Explain the following

i) States of nature ii) Acts iii) payoff

iv) Maximax criterion v) Maximin criterion

v) Laplace criterion vii) Minimax Regret criterion

vi) What is the full forms of E.M.V. and E.O.L.

4) Solve the following decisions problem using:

Maximax ii) Maxmin iii) Laplace Criterion

i)

Events	Action		
	A_1	A_2	A_3
S_1	20	15	23
S_2	25	10	30
S_3	35	25	20

ii

States of Nature	Actions		
	A_1	A_2	A_3
S_1	15	22	12
S_2	20	30	24
S_3	10	25	15

5) Construct Regret Matrix and give best decision by Minimax criterion

States of nature	Action		
	A_1	A_2	A_3
S_1	12	20	10
S_2	15	10	13
S_3	25	17	15

States of nature	Actions			
	A_1	A_2	A_3	A_4
S_1	5	8	21	30
S_2	10	22	18	7
S_3	18	8	12	19

6) Draw a decision tree for the following decision making problem and suggest the best decision by E.M.V. method

Actions	States of nature		
	S1	S2	S3
A1	34	20	18
A2	14	16	12
Probability	0.2	0.3	0.5

Type of policy	Participation Level		
	High	Medium	Low
A	20	18	10
B	15	30	20
Probability	0.35	0.30	0.35