

Time: 2:30hrs

Max.Marks:75

Instructions:

- (1) All questions are compulsory.
- (2) Each question carries the same marks.
- (3) Only simple calculators are allowed.

Q1 (a) Write the properties of Arithmetic Mean. (5)

(b) An average daily wages of all the 90 workers in a factory is Rs 60. An average daily wages of female workers is Rs. 45. Calculate an average daily wage of male workers if one-third workers are male. (5)

(c) Find the missing freq. for the following data, if the median is 16.5 kg. (5)

Weights in kgs	11-13	13-15	15-17	17-19	19-21
No. of children	11	18	28	-----	17

OR

Q1 (a) Mention how statistics can enhance the business designs in this competitive era. (5)

(b) Find the missing frequency for the data, if mode is 65. (5)

Class	20-40	40-60	60-80	80-100	100-120
Frequency	5	18	---	10	3

(c) There were 500 workers in a factory. Their mean was calculated as Rs.200. Later on it was discovered that the wages of two workers were misread as 180 and 20 in place of 80 and 220. Find the correct average. (5)

Q2 (a) Calculate product moment coefficient of correlation for the data: (5)

X	12	9	8	10	11	13	7
Y	14	8	6	9	11	12	3

(b) Calculate rank correlation coefficient for the following data: (5)

X	49	69	39	49	29
Y	59	59	59	49	39

(c) The arithmetic mean and the standard deviation of the values of 100 items in a group are 80 and 5 respectively. In a second group of 25 items, each item has a value equal to 60. Find the arithmetic mean and the standard deviation of the values of the 125 items of the two groups taken together. (5)

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OR

Q2 (a) Find mean deviation from median and its coefficient for given data. (5)

Class limits	0-10	10-20	20-30	30-40	40-50
Frequency	8	15	22	15	8

(b) An analysis of monthly wages to the worker in two firms A and B belonging to the same industry gives the following results. (5)

	Firm A	Firm B
Number of workers	150	200
Average monthly wage	101.2	101.25
Variance	40.4	14.75

- (i) Which firm A or B, has a larger wage bill?  
 (ii) Which firm has greater variability?

(c) The mean and standard deviation of 100 items was found to be 60 and 10 respectively. Later it was found that the two items were wrongly taken as 5 and 45 instead of 30 and 20. Calculate the correct mean and standard deviation. (5)

Q3 (a) Write the properties of regression coefficient. (5)

(b) Find the index number for the year 1999 with base 1994 using family budget method. (5)

Commodities	Quantity 1994	Price in Rs.	
		1994	1999
A	30	11	12
B	40	15	16
C	25	18	25
D	15	20	20
E	20	20	25

Mr. Singh was getting a salary of Rs. 15000 per month in the year 1994. How much should he get in the year 1999 to maintain the same standard of living?(5)

(c) For the following data fit a regression line of Y on X using the method of least squares. Also estimate the most probable value of Y when X is 3.5. (5)

X	1	2	3	4	5	6
Y	3	5	7	9	11	12

OR

Q3 (a) Find Fisher's and Dorbishbowley index no. for the given data. (5)

Commodity	Base year		Current year	
	Price (Rs.)	Quantity(kg.)	Price (Rs.)	Quantity(Kg.)
Rice	4	15	5	20
Pulses	8	20	12	30
Sugar	6	25	8	20
Oil	14	10	2	15

(b) From the given data calculate equations of two lines of regression. Coefficient of correlation is 0.8 (5)

	Mean	Standard deviation
X	50	5
Y	20	4

(c) For the following data calculate the index no. by using (i) simple aggregative method (ii) weighted average of price relative. (5)

Commodity	Weight	Price (in Rs.)	
		Base year	Current year
A	30	4	5
B	40	6	11
C	10	5	8
D	20	2	3

Q4 (a) Two unbiased dice are rolled. Find the probability that: (5)

- (i) Both the dice show the same digit.
- (ii) The sum of the scores is an even number.

(b) A trader purchased a product on Monday of each week. It should be used within the week. Otherwise, it becomes worthless. The cost of the product is Rs.200 per unit and sold at Rs. 500. Per unit. The trader has managed following quantity. Find payoff matrix, EMV and EVPI (5)

Units managed (demand)	200	300	400
Number of weeks	5	25	20

(c) A consumer goods company has set up following pay off table for the sales return of their product. Three strategies (S1, S2, S3) are identify to deal with three uncertain state of nature (N1, N2, N3). (5)

	N1	N2	N3
S1	7,00,000	3,00,000	1,50,000
S2	5,00,000	4,50,000	0
S3	3,00,000	3,00,000	3,00,000

You are required to identify right strategy under following criteria.

- (i) Hurwicz with coefficient  $a=0.7$ .
- (ii) Laplace.
- (iii) Minimax regret.

OR

Q4 (a) Write in short with example. (5)

- (i) Union of two events
- (ii) Intersection of two events
- (iii) Mutually exclusive events

(b) A food product has life of only one week. It has selling price Rs.350 and cost price Rs.200. If not sold within the week, it has no realizable value. The demand situation and respective probability is given below. (5)

Demand	10	20	30	40	50
Probability	0.10	0.20	0.30	0.30	0.10

- (i) Prepare payoff table.
- (ii) Find EPPI and EVPI.

(c) The probability distribution of random variable X is given by: (5)

X	-2	-1	0	1	2	3
P(x)	0.1	K	0.2	2k	0.3	K

Find k, mean and variance.

Q5 (a) Write down the life table, from the given information about  $l_x$ , the number of squirrel living at the age x. (5)

X	0	1	2	3	4	5	6
$l_x$	90	80	70	60	45	25	0

(b) An endowment policy of Rs.2,00,000 for 24 years is taken by Mr. Ajay for a monthly mode payment. The tabulated rate of premium is Rs. 50, on which 5% extra addition for monthly mode of payment is done. The company offers Rs.3 per thousand rebates for policies with the sum assured Rs. 90,000 and above. Find the monthly premium. (5)

(c) Write in short in parameter, statistic and advantages of sampling. (5)

OR

Q5 (a) (i) Mr. X has a saving policy for 20 years terms for a sum assured of Rs.5,00,000. After seven years Mr. X was not able to pay premium and policy was converted to paid up policy. There was a vested bonus of Rs 50,000 upto that time find the paid up value. (5)

(ii) Mr. sohan converted his endowment policy for 20 years after 8 years to paid up policy and receive Rs.3,20,000 as paid up value. Find the sum assured.

(b) Write in short uses of vital statistics. (5)

(c) Fill in blanks in the following portion taken from a life table. (5)

Age in years	$l_x$	$d_x$	$q_x$	$p_x$	$L_x$	$T_x$	$e^o_x$
5	90,000	500	-	-	-	38,50,000	-
6	-	300	-	-	-	-	-