

Q.P. Code :25285**[Time: $2\frac{1}{2}$ Hours]****[Marks: 75]**

Please check whether you have got the right question paper.

- N.B.:
- i) All questions are compulsory
 - ii) In Q.1 attempt both the sub-parts A and B
 - iii) Figures to the right indicate marks
 - iv) Use of non-programmable calculator is allowed
 - v) Graph paper will be provided on request

Q.1 A) Fill in the blanks with the correct alternative (Attempt any Eight) (8)

- i) The construction of cumulative frequency table is useful in determining the _____.
(Mean, Median, Mode)
- ii) _____ is used to present data involving one variable.
(Multiple bar Diagram, Pie Diagram, Simple bar Diagram)
- iii) Mode is the _____.
(Least frequent value, Middle most value, Most Frequent Value)
- iv) The limits for correlation coefficient are
($-1 \leq r \leq 1$, $0 \leq r \leq 1$, $-1 \leq r \leq 0$)
- v) When the index number is calculated for more than one commodity it is called _____.
(Composite index, Value index, Simple Index)
- vi) The optimistic decision maker will use the principle of _____.
(Maximin, Minimax, Maximax)
- vii) With respect to time series, _____ variations occurs due to weather or customs.
(Cyclical, Irregular, Seasonal)
- viii) When the regression equation of weight on height is used, weight is the _____ variable.
(Independent, Dependent, Discrete)
- ix) _____ measures give actual extent of scatter of the data
(Relative, Absolute, Coefficient)
- x) For any probability mass function, sum of all the probabilities is equal to _____.
(-1, 0, 1)

Q.1 B) State whether the following statements are True or False. (Attempt any seven) (7)

- i) Variance is always non-negative.
- ii) If two variables are independent then they are correlated.
- iii) There are always two lines of regression for a paired set of data.
- iv) The sum of the deviations of all observations from their arithmetic mean is always zero.
- v) In Index number, the year selected as a reference period for comparison is called current year.
- vi) Irregular variations are unpredictable.
- vii) A random variable which can take all possible values over an interval is called a discrete random variable.
- viii) In decision theory probabilities are associated with states of nature.
- ix) Pie diagram is a two dimensional diagram.
- x) The class mark of a class interval is lower limit + upper limit.

Q.P. Code :25285**Q.2** Attempt either A or B**Q.2 A)****p)** Draw a less than ogive for the following data

Wages	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of workers	1	3	11	21	43	32	90

Hence find i) Q_1 and Q_3 ii) Number of workers having wages between 75 and 95. **(8)****q)** The following are the marks of three students in 4 subjects. The weights of the subjects are given. **(7)**
Decide which of the three students is the best.

Student	Marks			
	A	B	C	D
Amar	28	30	40	20
Akbar	35	25	20	15
Anthony	30	35	30	20
Weight	4	3	2	1

OR**Q.2 B)****p)** If the mode for the following distribution is 130, find the missing frequency. **(7)**

Class Interval	60-75	75-90	90-105	105-120	120-135	135-150
Frequency	3	3	6	-	7	6

q) i) Calculate the median height for the following data **(5)**

Height (in cms)	158-162	162-166	166-170	170-174	174-178	178-182
No. of students	3	7	12	15	6	2

q) ii) The average marks of a group of 100 students in Statistics are 60 and for other group of 50 students , the average marks are 90. Find the average marks of the combined group of 150 students. **(3)****Q.3** Attempt either A or B**Q.3 A)****p)** Calculate quartile deviation and its coefficient for the following data. **(7)**

Daily Wages (in Rs.)	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of Workers	10	17	26	30	33	25	12	9

q) Calculate coefficient of correlation between price and demand from the following data and hence comment on the result. **(8)**

Price	11	13	15	17	18	19	20
Demand	30	29	24	24	21	18	15

OR

Q.P. Code :25285**Q.3 B)**

- p) Given below are the mileage per litre of petrol for two brands of car in trial tests carried out. (8)

Brand A	9.2	9.1	9.7	10	9.3	11	8.7	10.5
Brand B	7.5	9.5	10.2	14.1	11.5	12.1	11	13.2

Use coefficient of variation to determine which brand is more consistent? Why?

- q) The following data represents the sales and the advertisement expenditure of a firm. (7)

	Sales in Crores (x)	Advertisement Expenditures in Crores (y)
Mean	40	6
S.D.	10	1.5

If the coefficient of correlation is 0.9, what should be the advertisement expenditure (y) if the firm proposes a sales target (x) of Rs. 60 crores.

Q.4 Attempt either (A) or (B)

Q.4 A)

- p) The following data give the number of T.V. Tubes produced by a certain manufacturer. Fit a straight line trend and hence estimate the production for the year 1995. (7)

Year	1986	1987	1988	1989	1990	1991	1992	1993	1994
T.V Tubes (in hundreds)	15	17	20	25	30	31	30	32	34

- q) Calculate Fishers' and Dorbish Bowley's Index number for the following data. (8)

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
Rice	4	15	5	20
Pulses	8	20	12	30
Sugar	6	25	8	20
Oil	14	10	21	15

OR**Q.4 B)**

- p) Calculate three yearly moving averages for the following data. (7)

Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
No. of Students	1500	1700	1800	1750	1850	2000	1950	1900	2200	2200

- q) i) Calculate cost of living index number for the following data. (4)

Group	Index Number	Weights
Food	221	35
Clothing	198	14
Fuel and Lighting	190	15
Rent	183	8
Miscellaneous	161	20

Q.P. Code :25285**q) ii) Calculate for the following data the types of index number as mentioned below (4)****a) Simple average of price relatives Method****b) Simple Aggregative Method**

Commodity	Base Year Price(in Rs.)	Current Year Price(in Rs.)
A	4	5
B	12	16
C	6	9
D	30	40
E	8	11

Q.5 Attempt either (A) or (B)**Q.5 A)****p)** A Company has to choose one of the four types of Biscuits - Glucose, Multigrain, Coconut and Cream. Sales expected during the next year are highly uncertain. Marketing department estimates the profits considering manufacturing cost, promotional efforts and distribution set up etc as given in table below:- (7)

Profits on estimated level of sales (in Rs. Lakhs) for Quantities

Course of Action	S ₁ 10,000 Quantity	S ₂ 20,000 Quantity	S ₃ 30,000 Quantity
Glucose (A1)	10	30	45
Multigrain (A2)	15	60	80
Coconut (A3)	20	35	60
Cream (A4)	30	55	70

What will be the company manager's decision if following criterion is applied? i) Maximin ii) Maximax iii) Hurwitz ($\alpha = 0.7$) iv) Minimax regret.**Q.5 q) i)** Mr. Kamath bought a T.V. from Kohinoor Electronics. Kohinoor Electronics offered an after sales contract for Rs. 1000 for next five years. Considering the experience of T.V. users, the following distribution of maintenance expenses for next five years is formed. (4)

Expense	0	500	1000	1500	2000	2500
Probability	0.35	0.25	0.15	0.1	0.08	0.07

What is the expected value of the maintenance cost? Should Mr. Kamath go for the contract?

Q.5 q) ii) The probability that A can hit a target is $\frac{1}{3}$ and probability that B can hit a target is $\frac{1}{4}$. If both A and B try to hit a target independently. Find the probability that -a) The target remains unhit. b) The target is hit. (4)**OR****Q.5 B)** Write short notes on : (Attempt any three) (15)

- Uses of Index Number
- Limitations of statistics
- Merits and Demerits of median
- Absolute and Relative Measures of Dispersion
- Essentials of a good table
