

Sr. No. of Question paper : 13352
 Unique Paper Code : 2414090007
 Name of the Paper : Statistics for Business Management
 Type of the Paper : GE
 Semester : VII
 Programme : Generic Elective UGCF (GE)
 Duration: 3 Hrs. Maximum Marks: 90

Instruction for Candidates:

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt all questions.
3. All parts of a question to be attempted together.
4. All questions carry equal marks.
5. Use of *simple calculator* is allowed.

Q1.

- a) "Statistics acts as instructor in complex business decision-making". Do you agree? Explain with suitable example. (4 Marks)
- b) What are the primary sources of data collection? Which one of them you will prefer to collect the data from the illiterate respondents and why? Explain. (9 Marks)
- c) Why and how data are classified and tabulated? Explain. (5 Marks)

OR

- d) "An intelligently drawn Diagram do not add anything to the meaning of statistics but portrays the salient characteristics of graph and series". In light this statement briefly explains the various types of diagrams. (9 Marks)
- e) The income of 40 employees is given (₹'000) in following table: (9 Marks)

50	11	23	31	33	55	42	30	53	42
21	32	48	27	50	44	37	11	36	11
10	12	36	51	57	20	23	14	51	58
53	60	12	50	48	30	51	33	52	11

You are required to classify and tabulate it into inclusive series 10 as width of class and convert it into exclusive series.

Q2.

- a) Showing the calculations, find the class limits of all the classes. Find the values of mean and median. (9 Marks)

Mid-points of classes	7.5	17.5	27.5	37.5	47.5
Frequency	28	42	60	37	33

- b) Mr. Rishi a food supplement supplier conducted survey on 100 customers and found that 10 customers of different age has shown their willingness to purchase the food supplement. Rishi wants to know the dispersion of age of these 10 customers. On behalf of Rishi you are required to find the mean deviation and coefficient of mean deviation for the following data: (9 Marks)

Age of customers'	50	46	79	26	39	65	99	29	72	85
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OR

- c) The number of employees, wages per employee and the variance of the wage of the employee for two factories are given as follows: (9 Marks)

	Factory A	Factory B
Number of employees	50	100
Average wages per employee per day (₹)	120	85
Standard Deviation	3	4

- I. In which factory is there greater variation in the distribution of wages per employee?
- II. Suppose in factory B, the wages of an employee were wrongly noted as Rs. 120 instead of Rs. 100, what would be the correct standard deviation for factory B?

- d) A factory has hired 120 workers of different age group from different cities to work in a factory. The mean of age of these workers is 50. But the number of workers f_1 and f_2 in age group of 20–40 and 60–80 is missing. Find the missing frequencies. (9 Marks)

Class:	0–20	20–40	40–60	60–80	80–100	Total
Frequency	17	f_1	32	f_2	19	120

Q3.

- a) A firm plan to bid ₹200 per packet for a contract to supply 500 packets of A4 size paper. It has two competitor Arun and Sandeep and it assume that Arun will bid less than ₹200 per packet is 0.4 and that Sandeep will bid less than ₹200 per packet is 0.3. if the lowest bidder gets all the businesses and the firms bid independently what is the expected value of the contract to the firm. (9 Marks)
- b) Under an employment promotion programme, it is proposed to allow sale of newspapers on railway stations during off-peak hours. The vendor can purchase the newspaper at a special concessional rate of ₹4 per copy against the selling price ₹7. Any unsold copies are, however, a dead loss. A vendor has estimated the following probability distribution for number of copies demanded. (5 Marks)

No. of copies	200	220	240	260	280	300
Probability	0.2	0.23	0.18	0.19	0.17	0.03

- c) Write short note on any one of the following: (4 Marks)
- Probabilistic criterion for decision making under risk or uncertainty.
 - Non-probabilistic criterion for decision-making under risk or uncertainty.

OR

- d) An economist believes that during periods of high economic growth, the Indian rupee appreciates with probability 0.60, in periods of moderate economic growth, the rupee appreciates with probability 0.30, and during period of low economic growth, the rupee appreciates with probability 0.20. During any period of time the probability of high economic growth is 0.40, the probability of moderate growth is 0.50, and the probability of low economic growth is 0.20. Suppose, the rupee has been appreciating during the present period. What is the probability if we are: (9 Marks)
- Experiencing a period of high economic growth?
 - Experiencing a period of high or moderate economic growth?
- e) Two friends Ramesh and Ram appear in an interview for two vacancies in the same post. The probability of Ramesh's selection is $1/2$ and that of Ram's selection is $1/3$. What is the probability that: (9 Marks)
- Both of them will be selected.
 - Only one of them will be selected.
 - None of them will be selected.

Q4.

- a) The following data are given regarding Maths and Science of a student:

	Marks in Maths (X)	Marks in Science (Y)
Mean	30	35
Standard Deviation	10	7
Correlation coefficient	0.8	

You are required to calculate the following:

- The two regression equations.
- Calculate the expected marks in Maths if the marks secured by a student in science is 40. (9 marks)

- b) Calculate Spearman's coefficient of rank correlation from the following data:

X	30	38	28	27	28	23	30	33	28	35
Y	29	27	22	29	20	29	18	21	27	22

(9 marks)

OR

- c) Distinguish between the correlation and regression. (6 Marks)
- d) From the Following data obtain the two regression equations and estimate the value of X when Y is 130 and estimate the value of Y when X is 30. Also estimate the coefficient of correlation. (12 Marks)

X	39	33	30	31	32	36	41	49	46	43
Y	132	134	138	129	136	131	132	135	128	125

Q5

- a) Following is data given for five commodities:

Commodity	Base Year		Current Year	
	Quantity	Price	Quantity	Price
A	80	25	100	30
B	36	22	50	28
C	32	54	56	48
D	80	20	90	25
E	60	18	70	22

You are required to find out price index by:

- Laspeyres's Method,
- Paasche's Method,
- Fisher's Ideal Index Method,

(9 Marks)

- b) Devavrat Ltd. collected the sales data over seven years from 2017 to 2024 from the sales department which is given below:

Year	2017	2018	2019	2020	2021	2022	2023	2024
Sales	20	22	24	21	23	25	26	27

You are required to fit a straight-line trend using method of least square.

(6 Marks)

- c) Write a short note on uses of index number.

(3 Marks)

OR

- d) Discuss the components of time series analysis with the help of examples. (4 Marks)

- e) Following is the data collected during a consumer survey:

Item	Weight	Prices (2023)	Prices (2024)
Food	5	150	225
Rent	2	40	60
Clothing	3	70	105
Fuel and power	3	100	125
Miscellaneous	2	125	150

You are required to find out consumer price index.

(9 Marks)

- f) The following equation is derived from the production of steel:

$$Y = 15.25 + 1.89X$$

(origin 2012, Time unit: 1 year, Y unit: Tones per year)

- Shift the origin to 2018
- Convert the annual trend into monthly trend.

(5 Marks)