

Total Marks 80

(3 Hours)

NB

- 1) Question **number 1** is compulsory
- 2) Attempt **any three** out of the remaining **five questions**.
- 3) Assume suitable data if **necessary** and justify the assumptions.
- 4) Figures to the **right** indicate full marks

Q1

20

- a) Explain Bar chart with following example:
Ex. The following table shows the number of books of different subject in library.

Subject	Phy.	Chem.	Bio.	Hist.	Gio.	Eng.	Math.	Comp
No. of Books	100	125	75	75	50	200	250	175

- b) Equations of the two lines of regression are: $x + 6y = 6$ and $3x + 2y = 10$
Find :
- i) mean of x and mean of y
 - ii) regression coefficients b_{yx} and b_{xy}
 - iii) Correlation coefficient between x and y
- c) In a certain trivariate distribution: $r_{12} = 0.7$, $r_{23} = r_{31} = 0.6$ find The partial correlation coefficient $r_{12.3}$
- d) A survey conducted over the last 25 years indicated that in 10 years the winter was mild, in 8 years it was cold and in the remaining 7 years it was very cold. A company sells 1000 woollen coats in a mild year, 1300 in a cold year and 2000 in a very cold year. You are required to find the yearly expected profit of the company if a woollen coat costs Rs. 1730 and it is sold to stores for Rs. 2480.

Q2

- a) Define the term “Statistics” and discuss its use in business and trade. Also point out its limitations. **10**
- b) What are the various methods of collecting statistical data? Which of these is most reliable and why? **10**

Q3

- a) Find the Mean Deviation From the Median for the following data **10**

Age of Workers	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60
No. of Workers	120	125	175	160	150	140	100	30

- b) A survey of 370 students from Commerce Faculty and 130 students from Science Faculty revealed that 180 students were studying for only C.A. Examinations, 140 for only Costing Examinations and 80 for both C.A. and Costing Examinations. The rest had offered part-time Management Courses. Of those studying for Costing only, 13 were girls and 90 boys belonged to Commerce Faculty. Out of 80 studying for both C.A. and Costing, 72 were from Commerce Faculty amongst which 70 were boys. Amongst those who offered part-time Management Courses, 50 boys were from Science Faculty and 30 boys and 10 girls from Commerce Faculty. In all there were 110 boys **10**

in Science Faculty. Present the above information in a tabular form. Find the number of students from Science Faculty studying for part-time Management Courses.

- Q4** a) A departmental store gives in-service training to its salesmen which is followed by a test. It is considering whether it should terminate the service of any salesman who does not do well in the test. The following data give the test scores and sales made by nine salesmen during a certain period : **10**

Test scores	14	19	24	21	26	22	15	20	19
Sales ('000 Rs.)	31	36	48	37	50	45	33	41	39

Calculate the coefficient of correlation between the test scores and the sales. Does it indicate that the termination of services of low test scores is justified? If the firm wants a minimum sales volume of Rs. 30,000, what is the minimum test score that will ensure continuation of service ? Also estimate the most probable sales volume of a salesman making a score of 28.

- b) Define a random variable and its mathematical expectation. **10**
- Q5** a) Write a detailed note on least square regression. **10**
 b) What are the test of skewness? **10**
- Q6** a) Explain the following point Estimation Properties with Example **10**
 i) Consistency
 ii) Unbiasedness
 b) What is Hypothesis testing? For large samples explain **10**
 i) Test of significance for a single mean
 ii) Test of significance of difference between two means
