AR–2502

Faculty of Engineering & Technology

M.C.A./ P.G.D.C.S. First Year Semester–I (C.G.S.) Examination

COMPUTER ORIENTED STATISTICAL METHODS

(15503)

Paper—1 MCA 3

Time : Three Hours] [Maximum Marks : 80

INSTRUCTIONS TO CANDIDATES

(1) All questions carry marks as indicated.

(2) Due credit will be given to neatness and adequate dimensions.

(3) Assume suitable data wherever necessary.

(4) Illustrate your answers wherever necessary with the help of neat sketches.

(5) Use pen of Blue/Black ink/refill only for writing the answer book.

1. (a) Explain Sturgis's rule for number of classes. 5

(b) For the distribution given below, draw Histogram, Frequency Polygon and both the Ogives.

x	0-10	10-20	20-30	30-40	40-50	50-60	60-70
f	4	8	11	15	12	6	3

8

OR

2. (a) Explain Inclusive and Exclusive type classes for group frequency distribution. 6

(b) The following table shows the area in millions of sq. km. of oceans of the world :

Ocean	Area (million Sq. Km)
Pacific	70.8
Atlantic	41.2
Indian	28.5
Antarctic	7.6
Arctic	4.8

Draw a Pie diagram to represent the data. 7

3. (a) Define Arithmetic Mean. Write and explain properties of Arithmetic Mean. State the merits and demerits of it. 7

(b) Determine the mode of the following data :

x	20	21	22	23	24	25	26	27	28	29
f	6	9	4	2	10	8	7	5	1	3

6

OR

4. (a) Calculate the mean deviation from mean and also coefficient of M.D. about mean for the following data :

Class Interval :	2-4	4-6	6-8	8-10
Frequency :	3	4	2	1

7

(b) Define Median. Write merits and demerits of it. 6

5. (a) What is Kurtosis ? Explain its different types with suitable diagram. 6

(b) The first three moments of a distribution about the value 71 of the variable are 0.45, 8.73 and 8.91. Calculate the second and third moments and calculate r_1 and β_1. 8

OR

6. (a) Calculate the Pearson's coefficient of skewness from the following :

Wages (Rs.) :	0-10	10-20	20-30	30-40	40-50
No. of Workers :	15	20	30	25	10

8

(b) The measure of skewness for a certain distribution is – 0.8. If the lower and upper quartiles are 44.1 and 56.6 respectively, find the median. 6

7. (a) Two judges in a beauty competition rank the 12 entries as follows :

x :	1	2	3	4	5	6	7	8	9	10	11	12
y :	12	9	6	10	3	5	4	7	8	2	11	1

What degree of agreement is there between the two judges ? 8

(b) Define the term correlation. Explain the concept of positive and negative correlation with examples. 6

OR

8. (a) Calculate Karl Pearson's coefficient of correlation between expenditure on advertising and sales from the data given below :

Advertising Expenses ('000 Rs.) :	39	65	62	90	82	75	25	98	36	78
Sales (lakh Rs.) :	47	53	58	86	62	68	60	91	51	84

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(b) The coefficient of correlation between two variables X and Y is 0.48. The covariance is 36. The variance of X is 16. Find the standard deviation of Y. 6

9. (a) Explain multiple correlation coefficient. State the properties of multiple correlation coefficient. 5

(b) Obtain the equations of the two lines of regression for the following data :

X :	43	44	46	40	44	42	45	42	38	40
Y :	29	31	19	18	19	27	27	29	41	30

Hence obtain the value of the correlation coefficient between X and Y. 8

OR

10. (a) The lines of regression of a bivariate population are :

$8x - 10y + 66 = 0$

$40x - 18y = 214$

The variance of x is 9. Find :

(i) The mean values of x and y.

(ii) Correlation coefficient between x and y.

(iii) Standard deviation of y. 8

(b) What are the regression coefficients ? Point out their important properties. 5

11. (a) Explain briefly the method of moving averages for calculating the trends. 5

(b) Fit an equation of the form

$Y = a + bx + cx^2$ to the data given below.

X :	1	2	3	4	5
Y :	25	28	33	39	46

8

OR

12. (a) Explain the components into which a time series may be analysed. 6

(b) Fit a trend line to the following data by the least squares method :

Year :	1975	1977	1979	1981	1983
Production (in '000 tons) :	18	21	23	27	16

Estimate the production in 1980 and 1985. 7