2018

M.Com.

2nd Semester Examination

BASIC STATISTICS

PAPER—COM-204

Subject Code—03

Full Marks : 50

Time : 2 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

(CBCS)

Unit - I

(Marks : 20)

1. Answer any *two* of the following questions : 2×5

(a) Define the following :

(i) Frequency Distribution ;

(ii) Relative measures of dispersion. 2½+2½

(b) Prove that the sum of the deviations of $x_1, x_2, \ldots, x_n$ from their mean $\bar{x}$ is equal to zero. 5

(c) You are given below the information about advertising and sales of a group of corporate :

	Advertising (X) Expenditure (₹ Crores)	Sales (Y) (₹ Crores)
Mean	20	100
S.D.	5	12

Correlation Co-efficient = 0.8

Find the two regression equations from the above. 3+2

(d) The correlation coefficient between a general intelligence test and school achievement of a group of children from 8 to 14 years age is 0.80. The correlation between the general intelligence test and age of the same group is 0.70 and the correlation between school achievement and age is 0.60. What is the correlation between general intelligence and school achievement in children of the same age ? 5

2. Answer any *one question of the following :* 1×10

(a) (i) The mean and S.D. calculated from 20 observations are 15 and 10 respectively If an additional observation 5, left out through oversight, be included in the calculations, find the correct mean and S.D.

(ii) Determine Q_1, Q_3 and the median (Q_3) from the following frequency table :

Marks in English :	10–19	20–29	30–39	40–49	50–59	60–69	Total
Frequency :	8	11	15	17	12	7	70

5+5

(b) (i) If the regression equation of y on x be Y = .57X + 6.93 and the regression equation of x on y be X = 1.12Y – 2.46, find the Correlation Co-efficient between X and Y.

(ii) Callculate the Co-efficient of rank correlation of the following data :

X :	80	78	75	75	68	67	60	59
Y :	12	13	14	14	14	16	15	17

3+7

Unit – II

(Marks : 20)

3. Answer any *two* questions of the following : 2×5

(a) Distinguish between –

(i) Null Hypothesis and Alternative hypothesis.

(ii) Type-I eror and Type-II error. 2½+2½

(b) Write the basic steps to be followed in the process of testing of statistical hypothesis. 5

(c) Write short note on (i) mutually exclusive event and (ii) equally likely event. 5

(d) A bag contains 30 balls numbered from 1 to 30. One ball is drawn at random. Find the probability that the number of the ball drawn will be a multiple of (a) 5 or 7, and (b) 3 or 7. 5

4. Answer any *one* of the following questions : 1×10

(a) (i) In 2015, it was reported that 30% of students of a particular high school of Kharagpur smoked. To encourage the students to stop smoking, the high school principal made a campaign of "No Smoking" on a regular basis in hopes to decrease the

percentage of students who smoke, Three years later, he sampled 300 students and found that 75 of them smoked. At 5% level of significance, is there sufficient evidence to show that "stop smoking" compaign reduced the proportion of students who smoked ?

(ii) A study on 10,000 young people of Punjab regarding their drinking habits and police initiatives for it's controlling revealed the following facts :

	Alcohol Drinking		
	Never	*Occasional*	*Frequent*
Trouble with Police	70	150	380
No. Trouble with Police	4430	2370	2600

Is there any significant evidence that trouble with police is independent from alcohol drinking ? Test at 5% level.

(b) (i) State the conditions under which the Binomial Distribution is applied.

(ii) A lock manufacturing company supplies locks to a retailer in different batches. A single batch size contains 300 locks. The companies past record suggests that on an average, in a single batch, 10

locks are defective. The number of defects per batch follows Poisson distribution. In a random selection of locks in a batch :

— what is the probability of finding two or fewer defectives in a batch ?

— what is the probability that the batch contains $6 < x < 10$ defectives ? 4+6

[Internal Assessment — 10 Marks]

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