M.Com. 2nd Semester Examination, 2023
COMMERCE

(*Basic Statistics*)

PAPER — COM-204(CBCS)(Old)

Full Marks : 50

Time : 2 hours

The figures in the right hand margin indicate marks

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

COM 204.1

[Marks : 20]

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

   (*a*) Illustrate a continuous and a discrete variable.

   (*b*) State any two properties of correlation co-efficient(r).

   (*c*) What do you mean by frequency distribution ?

   (*d*) What are the different measures of variability of observations ?

(*Turn Over*)

2. Answer any *two* of the following :   4 × 2

   (a) The mean and standard deviation of 20 items is found to be 15 and 2 respectively. At the time of checking it is found that one item of value 10 is incorrect and it should be replaced by 12. Calculate the correct mean and standard deviation.

   (b) The median, mean and co-efficient of skewness of a certain distribution are 80, 86 and 0.42 respectively. Calculate Co-efficient of Variation.

   (c) Calculate the co-efficient of correlation of 10 observations from the following information :

   $\sum X = 120; \sum Y = 80; \sum X^2 = 1560; \sum Y^2 = 650$ and $\sum XY = 1010$.

   (d) The mean age of a group of 100 children is 12 years. The mean age of 45 children among them is 10 years and 40 children is 12 years. What is the mean age of the remaining children ?

3. Answer any *one* of the following : 8×1

(*a*) (*i*) From the following data calculate the first and fourth quartile :

X	0-5	5-10	10-15	15-25	25-35	35-60	60-80
Frequency	10	30	40	64	76	50	10

(*ii*) Find the value of F_2 from the following distribution. Assume arithmetic mean of the distribution is 70.5 inches $4 + 4$

Height (inches)	60-62	63-65	66-68	69-71	72-74
Frequency	15	F_2	60	80	30

(*b*) Write notes on the following :

(*i*) Median of a Frequency distribution

(*ii*) Rank Correlation

(*iii*) Standard Deviation. $2 + 3 + 3$

COM 204.2

[Marks : 20]

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

(*a*) Define 'classical probability'.

(b) What is 'level of significance'?

(c) Write the probability mass function (pmf) of a Poisson distribution. Give two examples where Poisson distribution is a better fit.

(d) State two advantages of sampling.

5. Answer any *two* of the following questions : 4×2

(a) How would you distinguish between simple random sampling with replacement (SRSWR) and simple random sampling without replacement (SRSWOR)?

(b) State the steps in testing of hypothesis.

(c) In a newly admitted M.Com. class, there are 90 students out of which 30 got first class marks in B.Com. If you select 5 students at random from the class then what is the probability that there will be 3 students who got first class?

(d) A coin is tossed for 600 times and head appears for 280 times. Test at 5% level whether the coin is unbiased.

(*Continued*)

6. Answer any *one* of the following questions : 8×1

   (*a*) (*i*) A box contains respectively 4 white, 6 black and 5 red balls. If 4 balls are chosen from the box at random then find the probability that there will be at least 1 ball of each color.

      (*ii*) Three friends Arun, Barun and Tarun are trying to solve a statistical problem. The probability that they will solve the problem is 0.6, 0.4 and 0.7 respectively. If all of them try to solve the problem independently then what is the chance that the problem will be solved ? $4 + 4$

   (*b*) (*i*) Distinguish between Type-I error and Type-II error.

      (*ii*) The following table gives the number of aircraft accidents that occur during the various days of the week. Test whether the accidents are uniformly distributed over the week.

Days	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
No. of accidents	14	16	8	12	11	9	14

[Given: the values of chi-square for 6 degrees of freedom and for 5% level of significance is 12.59]. 3 + 5

[*Internal Assessment* — 10 Marks]