Name **24U372**

Reg. No .....

END SEMESTER EXAMINATION - OCTOBER 2024

SEMESTER 3 : INTEGRATED M.Sc. PROGRAMME COMPUTER SCIENCE - DATA SCIENCE

COURSE : **21UP3CPSTA01 : PROBABILITY AND STATISTICS**

(For Regular 2023 Admission and Improvement/Supplementary 2022/2021 Admissions)

Time : Three Hours Max. Weightage: 30

PART A

Answer any 8

1. What are the different types of tables?
2. Examine whether the following is a p.d.f.

$$f\left(x\right) = \begin{cases} \frac{1}{3} \; for \; x = -1 \\ \frac{1}{3} \; for \; x = 0 \\ \frac{1}{3} \; for \; x = 5 \end{cases}$$

3. Given coefficient of skewness = -0.023, mean = 47.2 and s.d. = 12. Find mode and median of the distribution.
4. Find x when the arithmetic mean of 7, x-2 and x+3 is 9?
5. Distinguish between census and sampling.
6. What are the uses of moments?
7. Find k, if f(x,y) = k, 0<x<1, 0<y<1 is a joint probability density function.
8. Find the correlation between X and Y if Y=5,7,9,11 according as X=2,3,4,5
9. Explain the terms ' apriori probabilities' and posteriori probabilities in connection with Baye's theorem.
10. For what type of variables are interval and ratio measurement scales used?

(1 x 8 = 8 Weight)

PART B

Answer any 6

11. If $f(x,y) = kx^2 (1-y)$ for 0<x<2, 0<y<1 is the joint p.d.f of (X,Y) find (i) k (ii) find the marginal distribution function of X and Y.
12. For the numbers 2,4,6,8,10 show that A.M>G.M.>H.M.
13. Define simple random sampling. Distinguish between simple random sampling with and without replacement.
14. Define sample space and write the sample space in an experiment of tossing two coins.
15. Distinguish between correlation and regression.
16. Show that correlation coefficient lies between -1 and +1
17. Calculate harmonic mean from the following

Class	0-20	20-40	40-60	60-80	80-100
Frequency	11	13	17	21	23

18. Explain diagramatic and graphical representation of data .

(2 x 6 = 12 Weight)

PART C

Answer any 2

19. From the following data locate the values of median, quartiles 6th decile and 70th percentile,

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No.of students	5	8	7	12	28	20	10	10

20. Draw less than and greater than ogives for the following frequency distribution of the marks obtained for 100
students in Mathematics.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	6	12	20	30	18	10	4

21. Find the rank correlation coefficient for the following data wages and cost of living

Wages X	100	101	102	100	100	99	97	98	96	95
Cost of living Y	98	99	99	97	95	92	95	94	90	96

22. Define joint probability distribution funcion. If f(x,y) = k for 0<x<y<1
is the joint p.d.f of (X,Y), find (i) k (ii) Examine whether X and Y are independent.

(5 x 2 = 10 Weight)