TDC Odd Semester Exam., 2020
held in July, 2021

COMPUTER SCIENCE

(Honours)

(1st Semester)

Course No. : BCSH–103

(Statistical Methods and Applications)

Full Marks : 35
Pass Marks : 12

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, selecting **one** from each Unit

UNIT—I

1. *(a)* What do you understand by dispersion? Define the important measures of dispersion. 1+3=4

(b) Calculate the coefficient of variation from the following data : 3

Class :	10–19	20–29	30–39	40–49	50–59
Frequency :	11	18	25	22	30

2. *(a)* A card is drawn from a well-shuffled pack of 52 cards. What is the probability that it is either a spade or an ace? 4

(b) If two dice are thrown, what is the probability that the sum is neither 8 nor 10? 3

UNIT—II

3. Define continuous random variable. Let X be a continuous random variable with p.d.f.

$$f(x) \quad \begin{array}{lll} ax & , & 0 \quad x \quad 1 \\ a & , & 1 \quad x \quad 2 \\ ax \quad 3a, & & 2 \quad x \quad 3 \\ 0 & , & \text{otherwise} \end{array}$$

(a) Determine the constant a.

(b) Compute $P(X \quad 1 \quad 5)$. 3+4=7

4. *(a)* A random variable X assumes the values –3, –2, –1, 0, 1, 2, 3 such that

$P(X \quad 3) \quad P(X \quad 2) \quad P(X \quad 1)$
$P(X \quad 1) \quad P(X \quad 2) \quad P(X \quad 3)$
$P(X \quad 0) \quad P(X \quad 0) \quad P(X \quad 0)$

Obtain the probability mass function of X and its distribution function. 4

(b) Define the following terms : 1½+1½=3

(i) Random experiment

(ii) Probability distribution

UNIT—III

5. *(a)* If X and Y are independent Poisson variates with means $_1$ and $_2$ respectively, find the probability that

(i) $X \quad Y \quad K$

(ii) $X \quad Y$ 2+2=4

(b) Show that the sum of two binomial variates is not a binomial variate. State the conditions under which the sum of two binomial variates is a binomial variate. 3

6. Seven coins are tossed and number of heads are noted. The experiment is repeated 128 times and the following distribution is obtained :

No. of Heads :	0	1	2	3	4	5	6	7
Frequencies :	7	6	19	35	30	23	7	1

Fit a binomial distribution assuming the coin is unbiased. 7

UNIT—IV

7. If X and Y are standardized random variables and

$$r(aX \quad bY, bX \quad aY) \quad \frac{1 \quad 2ab}{a^2 \quad b^2}$$

find $r(X, Y)$ the coefficient of correlation between X and Y. 7

8. *(a)* The equations of two lines of regression are $x \; 2y \; 5 \; 0$ and $2x \; 3y \; 8 \; 0$. Find $\bar{x}$, $\bar{y}$ and r. 3

(b) Write a short note on multiple regression. 4

UNIT—V

9. *(a)* Define parameter, statistics and standard error. 3

(b) Write a short note on large sample tests. 2

(c) Define Student's t-statistics. 2

10. A dice is thrown 9000 times and a throw of 3 or 4 is observed 3240 times. Show that the dice cannot be regarded as an unbiased one and find the limits between which the probability of a throw of 3 or 4 lies. 7

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