VIT

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

SCHOOL OF ADVANCED SCIENCES

Winter Semester 2023-2024

Continuous Assessment Test –I

Programme Name & Branch: B.Tech

Slot: G2+TG2

Course Name & code: Probability and Statistics & BMAT202L

Exam Duration: 90 Min. **Maximum Marks: 50**

Answer ALL the Questions

Q. No. | **Question** | **Max Marks**

1. Find the mean, median and mode for the following data — **10**

Class	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
Frequency	3	7	13	17	12	10	8	8	6	6

2. Find the quartiles Q_1, Q_2, Q_3 and coefficient of quartile deviation for the following data. — **10**

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	8	20	34	46	28	14	10

3. The following table represents the joint probability distribution function of the discrete random variables X and Y — **10**

X / Y	1	2	3
1	1/12	1/6	0
2	0	1/9	1/5
3	1/18	1/4	2/15

(i) Find the conditional distribution of X given $Y = 2$.
(ii) Find the conditional distribution of Y given $X = 3$.
(iii) Find $P(X \leq 2, Y = 3)$
(iv) Find $P(X + Y < 4)$

4. If X and Y are two random variables having joint probability density function: — **10**

$$f(x,y) = \begin{cases} \frac{1}{k}(6 - x - y), 0 \leq x < 2, 2 \leq y < 4 \\ 0, \quad \text{otherwise} \end{cases}$$

Find (i)Find the value of k (ii) $P(X < 1 \cap Y < 3)$ (iii) $P(X + Y < 3)$ and (iv) $P(X < 1 / Y < 3)$

5. Calculate the coefficient of correlation between x and y from the following data: — **10**

x	60	34	40	50	45	41	22	43
y	75	32	34	40	45	33	12	30