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(common) **Slot : G1+TG1**

Course Name : Probability and Statistics **Course Code : BMAT202L**

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

Answer ALL Questions(5x10=50 Marks)

1. Find the value of Mean, Median and Mode from the data given below

Weight(kg)	20-40	40-60	60-80	80-100	100-120	120-140	140-160	160-180	180-200
No of Students :	8	12	20	30	40	35	18	7	5

2. The scores of two bats man A and B in a series of matches are as follows:

A : 37 43 28 62 59 20 83 48 52 47

B : 35 52 77 38 26 58 63 31 40 46

Which of the two batsman do you consider the more consistent and more efficient?

3a) A discrete random variable has the following probability distribution

x	0	1	2	3	4	5	6	7	8
p(x)	a	3a	5a	7a	9a	11a	13a	15a	17a

(i) Find the value of a (ii)Find $P(x \geq 7)$ (iii) Find $P(3 < x < 7/x > 5)$

b) A lot containing 7 components is sampled by a quality inspector; the lot contains 4 good and 3 defective components. A sample of 3 is taken by the inspector. Find the expected value of number of good components in the sample.

4. Two electronic components of a missile system work in harmony for the success of the total system. Let X and Y denote the life in hours of the two components. The joint density of X and Y is

$$f(x,y) = \begin{cases} ye^{-y(1+x)} & x, y \geq 0 \\ 0, & elsewhere \end{cases}$$

(i) Give the marginal density functions for both random variables.

(ii) What is the probability that the lives of both components will exceed 2 hours?

5. Calculate the correlation coefficient between X and Y

X: 22 53 46 67 43 35 88 11 95 13

Y: 18 39 31 42 55 64 82 10 96 14