VIT

Vellore Institute of Technology

SCHOOL OF ADVANCED SCIENCES
DEPARTMENT OF MATHEMATICS
WINTER SEMESTER 2022-2023
CONTINUOUS ASSESSMENT TEST – I

Programme Name & Branch: B.Tech

Course Code: BMAT202L

Course Title: Probability and Statistics

Class Number: Common to all

Slot: F2+TF2 **Max. Marks:** 50 marks **Time duration:** 90 Minutes

Answer all the questions(5× 10=50)

S. No	Questions	Marks
1	Find the mean, median and mode for the following data Variable: 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 Frequency: 12 | 30 | 34 | 65 | 45 | 25 | 18	10
2	Calculate the quartile deviation and coefficient of variation from the following table, given the age distribution of 542 members. Age in Years: 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 No. Of members: 3 | 61 | 132 | 153 | 140 | 51 | 2	10
3	From a sack of fruit containing 3 oranges, 2 apples, and 3 bananas, a random sample of 4 pieces of fruit is selected. If X is the number of oranges and Y is the number of apples in the sample, find (a) the joint probability distribution of X and Y; (b) the marginal distribution functions of X and Y. (c) $P[(X, Y) \in A]$, where A is the region that is given by $\{(x, y) \mid x + y \leq 2\}$.	10
4	The joint probability density function of a two dimensional random variable (X,Y) is given by $$f(x,y) = \begin{cases} xy^2 + \frac{x^2}{8}, & 0 \leq x \leq 2, 0 \leq y \leq 1 \\ 0, & elsewhere. \end{cases}$$ Compute (i) $P(X > 1/\ Y < \frac{1}{2},)$ (ii) $P(Y < \frac{1}{2}/\ X > 1)$ (iii) $P(X > Y)$ (iv) $P(X + Y \leq 1)$	10

5	Ten people of various heights as under, were requested to read the letters on a car at 25 yards distance. The number of letters correctly read is given below.	10

Height(in feet)	5.1	5.3	5.6	5.7	5.8	5.9	5.10	5.11	6.0	6.1
No.of letters	11	17	19	14	8	15	20	6	8	12

Find the correlation between heights and visual power using Karl Pearson's method.