REG.NO.:

VIT
Vellore Institute of Technology

SCHOOL OF ADVANCED SCIENCES
CONTINUOUS ASSESSMENT TEST - I
WINTER SEMESTER 2025-2026

SLOT: D2+TD2

Programme Name & Branch	: B.Tech.
Course Code and Course Name	: BMAT202L - Probability and Statistics
Faculty Name(s)	: **common**
Class Number(s)	: **common**
Date of Examination	: 30-Jan-2026
Exam Duration	: **90 minutes** **Maximum Marks: 50**

General instruction(s):

- Answer All Questions
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)
- **CO1:** Compute and interpret descriptive statistics using numerical and graphical techniques.
  CO2: Understand the basic concepts of random variables and find an appropriate distribution for analyzing data specific to an experiment.
  CO3: Apply statistical methods like correlation, regression analysis in analyzing, interpreting experimental data.

<table>
<tr><th>Q. No</th><th>Question</th><th>M</th><th>CO</th><th>BL</th></tr>
<tr><td>1.</td><td>Find the mean, median and mode for the following wages distribution.
<table>
<tr><td>x</td><td>0-10</td><td>10-20</td><td>20-30</td><td>30-40</td><td>40-50</td><td>50-60</td><td>60-70</td></tr>
<tr><td>f</td><td>4</td><td>16</td><td>60</td><td>100</td><td>40</td><td>6</td><td>4</td></tr>
</table></td><td>10</td><td>1</td><td>2</td></tr>
<tr><td>2.</td><td>Calculate the mean, variance and standard deviation for the following frequency distribution. Also, find the value of co-efficient of variation.
<table>
<tr><td>x</td><td>10-20</td><td>20-30</td><td>30-40</td><td>40-50</td><td>50-60</td><td>60-70</td><td>70-80</td><td>80-90</td></tr>
<tr><td>f</td><td>52</td><td>68</td><td>85</td><td>92</td><td>100</td><td>95</td><td>70</td><td>28</td></tr>
</table></td><td>10</td><td>1</td><td>1</td></tr>
<tr><td>3.</td><td>If the random variable X takes the values 1, 2, 3 4 and 5 such that $2P(X=1) = 3P(X=2) = P(X=3) = 5P(X=4) = 3P(X=5)$, then find the probability distribution function and cumulative distribution function of X, $E(X)$, $V(X)$.</td><td>10</td><td>2</td><td>2</td></tr>
<tr><td>4.</td><td>If the joint density for the random variables (X, Y), where X is the unit temperature change and Y is the proportion of spectrum shift that a certain atomic particle produces is given by
$$f(x,y) = \begin{cases} cxy^2, & 0 < x < y < 1; \\ 0, & otherwise, \end{cases}$$
then find (i) value of c, (ii) $E(XY)$, (iii) $f_X(x)$ and $f_Y(y)$.</td><td>10</td><td>2</td><td>3</td></tr>
</table>

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5.	The expected remaining life of an electronic part is believed to be related to the age of the part. The ages of 10 of these parts that were in use on a certain date were recorded in operating hours. When each part burned out, the elapsed time was recorded as follows.	10	3	1

Age of the part (in hrs)	170	165	167	162	163	167	166	169	164	171
Remaining life (in hrs)	168	168	167	166	166	168	165	168	165	170

Determine the coefficient of correlation.

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