REG.NO.:

VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

SLOT:B1+TB1

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

Programme Name & Branch	**: B.Tech & (All Branches)**
Course Code and Course Name	**: BMAT202L Probability and Statistics**
Faculty Name(s)	**: Common Slot Question Paper**
Class Number(s)	**: Common Slot Question Paper**
Date of Examination	**: 28/01/2026**
Exam Duration	**: 90 minutes** **Maximum Marks: 50**

General instruction(s):

- Answer All Questions
- Rough work should not be done on question paper. It will be treated as malpractice.
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)

Course Outcomes Statements:

CO. 1: Compute and interpret descriptive statistics using numerical and graphical techniques.

CO. 2: Understand the basic concepts of random variables and find an appropriate distribution for analyzing data specific to an experiment.

CO. 3: 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>The median and mode of the following distribution are known to be 33.5 and 34 respectively. Find the values of f_3, f_4, f_5 with $\sum f = 230$.
<table>
<tr><td>Class</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>frequency</td><td>4</td><td>16</td><td>f_3</td><td>f_4</td><td>f_5</td><td>6</td><td>4</td></tr>
</table></td><td>10</td><td>1</td><td>1</td></tr>
<tr><td>2.</td><td>The following data gives the frequency distribution of the wages of 72 labourers in a factory. Find the mean deviation about the Arithmetic Mean .Also find coefficient of Mean Deviation.
<table>
<tr><td>Wages (₹)</td><td>13–17</td><td>18–22</td><td>23–27</td><td>28–32</td><td>33–37</td><td>38–42</td><td>44–47</td><td>48–52</td><td>53–57</td></tr>
<tr><td>Number of labourers:</td><td>2</td><td>22</td><td>19</td><td>14</td><td>3</td><td>4</td><td>6</td><td>1</td><td>1</td></tr>
</table></td><td>10</td><td>1</td><td>1</td></tr>
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3.	Given the following probability distribution: i. Find the value of c. ii. Find $P(x \geq 5)$ and $P(x < 3)$. iii. If $P(x \leq k) > \frac{1}{2}$, find the minimum value of k. iv. Determine the distribution function of X.	10	2	2
4.	Two random variables X and Y have the joint density function $f(x,y) = \frac{1}{8}(6-x-y)$, $0<x<2$, $0<y<4$. Find i..the marginal density functions of X and Y ii.conditional density function of X given Y iii.conditional density function of Y given X iv.Check whether X and Y are independant	10	2	2
5.	From past observations, the following data shows the heights of fathers (X) and their sons(Y): Calculate the coefficient of correlation between the heights of fathers and sons.	10	3	2

x	0	1	2	3	4	5	6	7
P(x)	0	c	2c	2c	3c	c^2	$2c^2$	$7c^2 + c$

X	65	66	67	67	68	69	71	73	60	65
Y	67	68	64	68	72	70	69	70	75	80