

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.

Q. No	Question	M	CO	BL																	
1.	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 $\sum f = 230$ .	10	1	1																	
	<table border="1"> <thead> <tr> <th>Class</th> <th>0-10</th> <th>10-20</th> <th>20-30</th> <th>30-40</th> <th>40-50</th> <th>50-60</th> <th>60-70</th> </tr> </thead> <tbody> <tr> <td>frequency</td> <td>4</td> <td>16</td> <td><math>f_3</math></td> <td><math>f_4</math></td> <td><math>f_5</math></td> <td>6</td> <td>4</td> </tr> </tbody> </table>				Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	frequency	4	16	$f_3$	$f_4$	$f_5$	6	4	
Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70														
frequency	4	16	$f_3$	$f_4$	$f_5$	6	4														
2.	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.	10	1	1																	
	<table border="1"> <thead> <tr> <th>Wages (₹)</th> <th>13-17</th> <th>18-22</th> <th>23-27</th> <th>28-32</th> <th>33-37</th> <th>38-42</th> <th>44-47</th> <th>48-52</th> <th>53-57</th> </tr> </thead> <tbody> <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> </tbody> </table>				Wages (₹)	13-17	18-22	23-27	28-32	33-37	38-42	44-47	48-52	53-57	Number of labourers:	2	22	19	14	3	4
Wages (₹)	13-17	18-22	23-27	28-32	33-37	38-42	44-47	48-52	53-57												
Number of labourers:	2	22	19	14	3	4	6	1	1												

REG.NO.:



VIT

Vellore Institute of Technology  
(Deemed to be University under section 3 of DGC Act, 1986)

SLOT: B1+TB1

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

3.	<p>Given the following probability distribution:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>x</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> </tr> <tr> <td>P(x)</td> <td>0</td> <td>c</td> <td>2c</td> <td>2c</td> <td>3c</td> <td>c<sup>2</sup></td> <td>2c<sup>2</sup></td> <td>7c<sup>2</sup> + c</td> </tr> </tbody> </table> <p>i. Find the value of c.            ii. Find <math>P(x \geq 5)</math> and <math>P(x &lt; 3)</math>.            iii. If <math>P(x \leq k) &gt; \frac{1}{2}</math>, find the minimum value of k.            iv. Determine the distribution function of X.</p>	x	0	1	2	3	4	5	6	7	P(x)	0	c	2c	2c	3c	c <sup>2</sup>	2c <sup>2</sup>	7c <sup>2</sup> + c	10	2	2															
x	0	1	2	3	4	5	6	7																													
P(x)	0	c	2c	2c	3c	c <sup>2</sup>	2c <sup>2</sup>	7c <sup>2</sup> + c																													
4.	<p>Two random variables X and Y have the joint density function <math>f(x,y) = \frac{1}{8}(6-x-y)</math>, <math>0 &lt; x &lt; 2</math>, <math>0 &lt; y &lt; 4</math>. Find</p> <p>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</p>	10	2	2																																	
5.	<p>From past observations, the following data shows the heights of fathers (X) and their sons(Y):</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td></td> <td>65</td> <td>66</td> <td>67</td> <td>67</td> <td>68</td> <td>69</td> <td>71</td> <td>73</td> <td>60</td> <td>65</td> </tr> <tr> <td>X</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Y</td> <td>67</td> <td>68</td> <td>64</td> <td>68</td> <td>72</td> <td>70</td> <td>69</td> <td>70</td> <td>75</td> <td>80</td> </tr> </tbody> </table> <p>Calculate the coefficient of correlation between the heights of fathers and sons.</p>		65	66	67	67	68	69	71	73	60	65	X	✓	✓	✓	✓	✓	✓			✓	✓	Y	67	68	64	68	72	70	69	70	75	80	10	3	2
	65	66	67	67	68	69	71	73	60	65																											
X	✓	✓	✓	✓	✓	✓			✓	✓																											
Y	67	68	64	68	72	70	69	70	75	80																											