

REG.NO.:



VIT

Vellore Institute of Technology
(Approved by the Council for Higher Education, India)

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

SLOT: D1+TD1

Programme Name & Branch : B.Tech.
Course Code and Course Name : BMAT202L - Probability and Statistics
Faculty Name(s) : Common Slot QP
Class Number(s) : Common Slot QP
Date of Examination : 18/03/2026
Exam Duration : 90 minutes **Maximum Marks: 50**

General instruction(s):

- Answer All Questions
- Statistical Tables are permitted
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyze, 5 – Evaluate, 6 – Create)
- Course Outcomes:
- 2: Understand the basic concepts of the variables and find an appropriate distribution for analyzing data specific to an experiment.
- 3: Apply statistical methods like correlation, regression analysis in analyzing, interpreting experimental data.
- 4: Make appropriate decisions using statistical inference that is the central to experimental research.

Q. No	Question	M	CO	BL																				
1	<p>A departmental store gives an in-service training to its salesmen, which is followed by a test. It is considering whether it should terminate the services of any salesman who does not do well in the test. The following data give test scores and sales made by 9 salesmen during a certain period.</p> <table border="1"> <thead> <tr> <th>Test Scores</th> <th>18</th> <th>23</th> <th>28</th> <th>25</th> <th>30</th> <th>26</th> <th>19</th> <th>24</th> <th>23</th> </tr> </thead> <tbody> <tr> <th>Sales(Rs. '000)</th> <td>51</td> <td>56</td> <td>68</td> <td>57</td> <td>70</td> <td>65</td> <td>53</td> <td>61</td> <td>59</td> </tr> </tbody> </table> <p>(i) Obtain the two regression equations (ii) What is the test score that will justify the continuous of the services if the firm wants a minimum sales value of Rs. 50,000. (iii) Estimate the most probable sales volume of a salesman making a score of 32.</p>	Test Scores	18	23	28	25	30	26	19	24	23	Sales(Rs. '000)	51	56	68	57	70	65	53	61	59	10	3	3
Test Scores	18	23	28	25	30	26	19	24	23															
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2	<p>An irregular 6 faced dice is thrown thirty times and the number of sixes seen is eight. If the dice is thrown a further twelve times:</p> <p>(a) find the probability that a six will occur exactly twice; (b) find the expected number of sixes; (c) find the variance of the number of sixes.</p>	10	2	2																				

3.	<p>The Vellore Institute of Technology installed 10,000 electric led bulbs in the Vellore campus. If these bulbs have an average life of 1,000 burning hours with a standard deviation of 200 hours, how many bulbs might be expected to fail</p> <p>(i) in the first 800 burning hours?</p> <p>(ii) between 800 and 1200 burning hours?</p> <p>After how many burning hours would you expect</p> <p>(iii) 10% of the bulbs to fail?</p> <p>(iv) 10% of the bulbs to be still burning?</p> <p>Assume that the life of the bulbs is normally distributed.</p>	10	2	3
4.	<p>A survey claims that 9 out of 10 doctors recommend aspirin for their patients with headaches. To test this claim, a random sample of 100 doctors is obtained. Of these hundred doctors, 82 indicate that they recommend aspirin. Is this claim accurate?</p>	10	4	3
5.	<p>A manufacturing firm claims that the batteries used in their electronic games will last an average of 30 hours. To maintain this average, 16 batteries are tested each month. If the computed t-value falls between $t_{-0.025}$ and $t_{0.025}$, the firm is satisfied with its claim. What conclusion should the firm draw from a sample that has a mean 27.5 hours and a standard deviation 5 hours? Assume the distribution of battery lives to be approximately normal.</p>	10	4	3