



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

Programme Name & Branch : B.Tech
 Course Code and Course Name : Probability and Statistics- BMAT202L
 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
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes: CO1- Compute and interpret descriptive statistics using numerical and graphical techniques.
 CO2- Understand the basic concept of random variable 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.

| Q. No | Question | M | CO | BL | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|-------------|---------|---------|---------|---------|---------|---------|---------|-----------------|---|------------|----|----|----|----|----|-----|-----|-----|-----|----|---|---|
| 1/ | Calculate the mean, median and mode for the following distribution: <table border="1" style="margin-top: 10px;"> <thead> <tr> <th>Marks</th> <th>120-124</th> <th>125-129</th> <th>130-134</th> <th>135-139</th> <th>140-144</th> <th>145-149</th> <th>150-154</th> </tr> </thead> <tbody> <tr> <td>No. of Students</td> <td>4</td> <td>12</td> <td>26</td> <td>30</td> <td>18</td> <td>8</td> <td>2</td> </tr> </tbody> </table> | Marks | 120-124 | 125-129 | 130-134 | 135-139 | 140-144 | 145-149 | 150-154 | No. of Students | 4 | 12 | 26 | 30 | 18 | 8 | 2 | 10 | 1 | 2 | | | | |
| Marks | 120-124 | 125-129 | 130-134 | 135-139 | 140-144 | 145-149 | 150-154 | | | | | | | | | | | | | | | | | |
| No. of Students | 4 | 12 | 26 | 30 | 18 | 8 | 2 | | | | | | | | | | | | | | | | | |
| 2/ | Find the coefficient of mean deviation from mean and coefficient of variation for the following data. <table border="1" style="margin-top: 10px;"> <thead> <tr> <th>X</th> <th>2</th> <th>4</th> <th>6</th> <th>8</th> <th>10</th> <th>12</th> <th>14</th> </tr> </thead> <tbody> <tr> <td>f</td> <td>5</td> <td>12</td> <td>20</td> <td>26</td> <td>20</td> <td>12</td> <td>5</td> </tr> </tbody> </table> | X | 2 | 4 | 6 | 8 | 10 | 12 | 14 | f | 5 | 12 | 20 | 26 | 20 | 12 | 5 | 10 | 1 | 3 | | | | |
| X | 2 | 4 | 6 | 8 | 10 | 12 | 14 | | | | | | | | | | | | | | | | | |
| f | 5 | 12 | 20 | 26 | 20 | 12 | 5 | | | | | | | | | | | | | | | | | |
| 3/ | A random variable X has the following probability function. <table border="1" style="margin-top: 10px;"> <thead> <tr> <th>Values of X</th> <th>0</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> </tr> </thead> <tbody> <tr> <td>$P(X = x)$</td> <td>a</td> <td>3a</td> <td>5a</td> <td>7a</td> <td>9a</td> <td>11a</td> <td>13a</td> <td>15a</td> <td>17a</td> </tr> </tbody> </table> (i) Find the value of a (ii) Find $P(X < 3)$, $P(0 < X < 3)$, (iii) Find the distribution function of X. (iv) Find mean and variance of X. | Values of X | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | $P(X = x)$ | a | 3a | 5a | 7a | 9a | 11a | 13a | 15a | 17a | 10 | 2 | 3 |
| Values of X | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | | | | | | | | |
| $P(X = x)$ | a | 3a | 5a | 7a | 9a | 11a | 13a | 15a | 17a | | | | | | | | | | | | | | | |
| 4. | The joint pdf of R.V. X and Y is given by $f(x, y) = kx^2y(1 + y), 0 < x < 1, 0 < y < 2x$ i) Find the value of k. ii) Find marginal probability density function of X and Y. iii) Verify whether X and Y are independent or not? iv) Find $P(Y < X)$ | 10 | 2 | 3 | | | | | | | | | | | | | | | | | | | | |
| 5/ | Compute the coefficient of correlation between X and Y using the following data: <table border="1" style="margin-top: 10px;"> <tbody> <tr> <td>X</td> <td>65</td> <td>67</td> <td>66</td> <td>71</td> <td>67</td> <td>70</td> <td>68</td> <td>69</td> </tr> <tr> <td>Y</td> <td>67</td> <td>68</td> <td>68</td> <td>70</td> <td>64</td> <td>67</td> <td>72</td> <td>70</td> </tr> </tbody> </table> | X | 65 | 67 | 66 | 71 | 67 | 70 | 68 | 69 | Y | 67 | 68 | 68 | 70 | 64 | 67 | 72 | 70 | 10 | 3 | 2 | | |
| X | 65 | 67 | 66 | 71 | 67 | 70 | 68 | 69 | | | | | | | | | | | | | | | | |
| Y | 67 | 68 | 68 | 70 | 64 | 67 | 72 | 70 | | | | | | | | | | | | | | | | |