



Continuous Assessment Test (CAT) – I AUGUST 2025

Programme	B.Tech.	Semester	Fall Semester 2025-26
Course Code & Course Title	BMAT202L & Probability and Statistics	Class Number(s)	CH2025260101123, 1121, 1327, 1117, 2422, 1322, 2425, 1111, 2424
Faculty	Dr. Ashish Nandi, Prof. Sakthidevi K, Dr. Surath Ghosh, Dr. Sudip Debnath, Dr. Saroj Dash, Dr. B. Krishna Kumar, Dr. B. Jaganathan, Dr. Mohana N, Dr. V. Parthiban	Slot	F1+TF1
Duration	90 Minutes	Max. Mark	50

General Instructions:

- Write only your registration number on the question paper in the box provided and do not write other information
- Use statistical tables supplied from the exam cell as necessary
- Use graph sheets supplied from the exam cell as necessary
- Only non-programmable calculator without storage is permitted

Answer all questions

Q. No	Description	Marks	CO	BT Level																																	
1.	<p>The following is the number of words typeset by two different typists A and B in 2 hours. They were tested on 10 consecutive days. Who is typing faster and who is more consistent?</p> <table border="1"> <thead> <tr> <th></th> <th>Day 1</th> <th>Day 2</th> <th>Day 3</th> <th>Day 4</th> <th>Day 5</th> <th>Day 6</th> <th>Day 7</th> <th>Day 8</th> <th>Day 9</th> <th>Day 10</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>700</td> <td>675</td> <td>725</td> <td>625</td> <td>650</td> <td>700</td> <td>650</td> <td>700</td> <td>600</td> <td>650</td> </tr> <tr> <td>B</td> <td>550</td> <td>600</td> <td>575</td> <td>550</td> <td>650</td> <td>600</td> <td>550</td> <td>525</td> <td>625</td> <td>600</td> </tr> </tbody> </table>		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	A	700	675	725	625	650	700	650	700	600	650	B	550	600	575	550	650	600	550	525	625	600	10	1	1
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10																											
A	700	675	725	625	650	700	650	700	600	650																											
B	550	600	575	550	650	600	550	525	625	600																											
2.	<p>Find the values of a, b, and c for the following table:</p> <table border="1"> <thead> <tr> <th></th> <th>Group I</th> <th>Group II</th> <th>Group III</th> <th>Combined</th> </tr> </thead> <tbody> <tr> <td>Number</td> <td>50</td> <td>a</td> <td>90</td> <td>200</td> </tr> <tr> <td>Std Dev</td> <td>6</td> <td>7</td> <td>b</td> <td>7.746</td> </tr> <tr> <td>Mean</td> <td>113</td> <td>c</td> <td>115</td> <td>116</td> </tr> </tbody> </table>		Group I	Group II	Group III	Combined	Number	50	a	90	200	Std Dev	6	7	b	7.746	Mean	113	c	115	116	10	1	2													
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Number	50	a	90	200																																	
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Mean	113	c	115	116																																	
Find	<p>The joint probability density function (PDF) of the random variables X and Y is defined as:</p> $f(x,y) = \begin{cases} k(x^2 + y^2), & \text{for } 0 < x < 1 \text{ and } 0 < y < 1 \\ 0, & \text{Otherwise} \end{cases}$ <p>(i) The value(s) of k, such that $f(x,y)$ will be a joint PDF. (ii) Justify whether X and Y are independent or not. (iii) Evaluate $P(X + Y < 1)$.</p>	10	2	2																																	

4.	A pair of fair dice are tossed twice. Let Y be the sum of the face values from both tosses. (i) Find the MGF of Y . (ii) Hence find the $E(Y)$ by using this MGF.							10	2	3
5.	The following data shows the speed of a car (in mph) and the corresponding stopping distance (in feet) collected during a road test.							10	3	1
Speed		4	10	12	14	16	18	19		
Distance		10	18	28	80	32	56	68		
(i)		Compute the Karl Pearson correlation coefficient.								
(ii)		Interpret the strength and direction of the relationship.								

*****All the best *****