



Continuous Assessment Test (CAT) – 1 AUGUST 2025

Programme	: B. Tech	Semester	: FALL Semester 2025-26
Course Code & Course Title	: BMAT202L & Probability and Statistics	Slot	: E2+TE2
Faculty	: Dr.G.K.Revathi , Dr.Dilleswar Rao , Dr.K. Sakthidevi , Dr. G Y Mythili, Dr.Avinash Kumar Mittal, Dr. R. Pavithra, Prof. S. Vaishnavi , Prof. R Chithraponnu , Dr. R. Kiruthika, Prof. B. Aarthi, Prof. C Yuvarani,	Class Number	: CH2025260101176, CH2025260101177, CH2025260101183, CH2025260101196, CH2025260101193, CH2025260101199, CH2025260101400, CH2025260101407, CH2025260101417, CH2025260101426, CH2025260101204.
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	Sub Sec.	Description	Marks	CO	BT Level																				
1	a	A student received an A grade in Physics, which carries 4 credits; a B grade in Chemistry, which carries 4 credits; a C grade in Biology, which carries 3 credits; and a B grade in Mathematics, which carries 5 credits. Assuming that A = 4 grade points, B = 3 grade points, C = 2 grade points, and D = 1 grade point, find the mean grade of the student.	5	CO1	K3																				
	b	An incomplete frequency distribution is given as follows: <table><tr><th>Variable</th><th>Frequency</th><th>Variable</th><th>Frequency</th></tr><tr><td>10-20</td><td>12</td><td>50-60</td><td>?</td></tr><tr><td>20-30</td><td>30</td><td>60-70</td><td>25</td></tr><tr><td>30-40</td><td>?</td><td>70-80</td><td>18</td></tr><tr><td>40-50</td><td>65</td><td>Total</td><td>229</td></tr></table> Given that the median value is 46, determine the missing frequencies.	Variable	Frequency	Variable	Frequency	10-20	12	50-60	?	20-30	30	60-70	25	30-40	?	70-80	18	40-50	65	Total	229	5	CO1	K3
Variable	Frequency	Variable	Frequency																						
10-20	12	50-60	?																						
20-30	30	60-70	25																						
30-40	?	70-80	18																						
40-50	65	Total	229																						
2	a	The variance of a series of numbers 2, 3, 11, and x is $12\frac{1}{4}$. Find the value of x .	4	CO1	K3																				

A botanist measured the heights (in cm) of plants in a greenhouse and grouped them into the following classes:

Height (in cm)	10-12	13-15	16-18	19-21	22-24
No. of plants	3	12	15	24	2

Calculate the Quartile Deviation.

The two dimensional random variable (X, Y) has the joint probability mass function $f(x, y) = \frac{x+2y}{27}$, $x = 0, 1, 2$; $y = 0, 1, 2$.

- Find the conditional distribution of Y given $X = 1$. (3 Marks)
- Find $P(X > Y)$ (2 Marks)
- Find the marginal distribution of X and Y . (2 Marks)
- Find the covariance of X and Y (3 Marks)

If the random variables X and Y have a joint density function given by

$$f(x, y) = \begin{cases} c(2x + y) & 2 < x < 6, 0 < y < 2 \\ 0 & \text{Otherwise} \end{cases}, \text{ then find}$$

- the constant c , (1 Mark)
- $P(X + Y > 4)$ (2 Marks)
- $P(X < 1/Y > 3)$ (2 Marks)

The p.d.f of a continuous random variable ' X ' is given by

$$f(x) = \begin{cases} \frac{1}{5} e^{-\frac{x}{5}} & 0 \leq x < \infty \\ 0 & \text{Otherwise} \end{cases}$$

Find the moment generating function, and hence, find the mean and variance of X .

The value of Spearman's rank correlation coefficient for a certain number of pairs of observations was found to be $2/3$. The sum of the squares of difference between the corresponding marks was 55. Find the number of pairs.

Calculate the coefficient of correlation between number of hours studied and test score from the following table and interpret the results.

No. of hours studied	1	2	2	3	3.5
Test score	65	80	73	69	81
No. of hours studied	4	4	5	5.5	
Test score	85	90	79	91	

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