



Continuous Assessment Test (CAT) – II OCTOBER 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.	The regression lines of y on x and of x on y are respectively $y = ax + b$ and $x = cy + d$, where $c \neq 0$ and $ac \neq 1$. (i) Find the mean of x and y . (ii) Determine the value of correlation coefficient between x and y . (iii) Show that the ratio of the standard deviations of y and x is $\sqrt{\frac{a}{c}}$.	10	3	2
2.	(a) The correlation between anxiety (A) and academic achievement (B) is -0.369 , intelligence (C) and academic achievement (B) is 0.918 , and anxiety (A) and intelligence (C) is -0.245 . Find the multiple correlation between academic achievement and the linear combination of intelligence and anxiety. [5 marks] (b) The average time between breakdowns of a generator is 15 days. (i) If the generator has just broken down, what is the probability that it will break down again within the next 21 days? (ii) What is the probability that the generator will run for at least 30 days without a breakdown? [5 marks]	10	3	2
3.	The average percentage of candidates in an examination is 42 with standard deviation of 10. If the minimum pass mark is 50% and 1000 candidates appear for the examination, (a) How many candidates can be expected to get pass mark? (b) If it is required that double the number of candidates should pass, what should be the minimum pass mark? (c) Find how many candidates are expected to score 70% or more?	10	2	3

4.	(a) After correcting 50 pages of the proof of a book, the proof reader finds that there are, on the average, 2 errors per 5 pages. How many pages would one expect to find with 0, 1, 2, 3 and 4 errors, in 1000 pages of the first print of the book? [5 marks]	10	2	4
	(b) If X and Y are two independent binomial variates with parameters $(n_1 = 3, p = 0.4)$ and $(n_2 = 4, p = 0.4)$ respectively, then find (i) $P(X + Y \leq 2)$ (ii) $P(X = 3 X + Y = 4)$ [5 marks]			
5.	(a) A sample of 900 items has mean 3.4 and standard deviation 2.61. Can the sample be regarded as drawn from a population with mean 3.25 at 5% level of significance? [5 marks]	10	4	3
	(b) It is thought that over 60% of the business offices in the United States have a mainframe computer as part of their equipment. (i) Set up the appropriate null and alternative hypotheses for supporting this claim. (ii) Find the critical point for an $\alpha = 0.05$ level test. (iii) When data are gathered, it is found that 223 of 375 offices studied have mainframe computers. Can the null hypothesis be rejected at $\alpha = 0.05$ level? [5 marks]			

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

STANDARD NORMAL DISTRIBUTION: Table Values Represent AREA to the LEFT of the Z score.

Z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.50000	.50399	.50798	.51197	.51595	.51994	.52392	.52790	.53188	.53586
0.1	.53983	.54380	.54776	.55172	.55567	.55962	.56356	.56749	.57142	.57535
0.2	.57926	.58317	.58706	.59095	.59483	.59871	.60257	.60642	.61026	.61409
0.3	.61791	.62172	.62552	.62930	.63307	.63683	.64058	.64431	.64803	.65173
0.4	.65542	.65910	.66276	.66640	.67003	.67364	.67724	.68082	.68439	.68793
0.5	.69146	.69497	.69847	.70194	.70540	.70884	.71226	.71566	.71904	.72240
0.6	.72575	.72907	.73237	.73565	.73891	.74215	.74537	.74857	.75175	.75490
0.7	.75804	.76115	.76424	.76730	.77035	.77337	.77637	.77935	.78230	.78524
0.8	.78814	.79103	.79389	.79673	.79955	.80234	.80511	.80785	.81057	.81327
0.9	.81594	.81859	.82121	.82381	.82639	.82894	.83147	.83398	.83646	.83891
1.0	.84134	.84375	.84614	.84849	.85083	.85314	.85543	.85769	.85993	.86214
1.1	.86433	.86650	.86864	.87076	.87286	.87493	.87698	.87900	.88100	.88298
1.2	.88493	.88686	.88877	.89065	.89251	.89435	.89617	.89796	.89973	.90147
1.3	.90320	.90490	.90658	.90824	.90988	.91149	.91309	.91466	.91621	.91774
1.4	.91924	.92073	.92220	.92364	.92507	.92647	.92785	.92922	.93056	.93189
1.5	.93319	.93448	.93574	.93699	.93822	.93943	.94062	.94179	.94295	.94408
1.6	.94520	.94630	.94738	.94845	.94950	.95053	.95154	.95254	.95352	.95449
1.7	.95543	.95637	.95728	.95818	.95907	.95994	.96080	.96164	.96246	.96327
1.8	.96407	.96485	.96562	.96638	.96712	.96784	.96856	.96926	.96995	.97062
1.9	.97128	.97193	.97257	.97320	.97381	.97441	.97500	.97558	.97615	.97670
2.0	.97725	.97778	.97831	.97882	.97932	.97982	.98030	.98077	.98124	.98169
2.1	.98214	.98257	.98300	.98341	.98382	.98422	.98461	.98500	.98537	.98574
2.2	.98610	.98645	.98679	.98713	.98745	.98778	.98809	.98840	.98870	.98899
2.3	.98928	.98956	.98983	.99010	.99036	.99061	.99086	.99111	.99134	.99158
2.4	.99180	.99202	.99224	.99245	.99266	.99286	.99305	.99324	.99343	.99361
2.5	.99379	.99396	.99413	.99430	.99446	.99461	.99477	.99492	.99506	.99520
2.6	.99534	.99547	.99560	.99573	.99585	.99598	.99609	.99621	.99632	.99643
2.7	.99653	.99664	.99674	.99683	.99693	.99702	.99711	.99720	.99728	.99736
2.8	.99744	.99752	.99760	.99767	.99774	.99781	.99788	.99795	.99801	.99807
2.9	.99813	.99819	.99825	.99831	.99836	.99841	.99846	.99851	.99856	.99861
3.0	.99865	.99869	.99874	.99878	.99882	.99886	.99889	.99893	.99896	.99900
3.1	.99903	.99906	.99910	.99913	.99916	.99918	.99921	.99924	.99926	.99929
3.2	.99931	.99934	.99936	.99938	.99940	.99942	.99944	.99946	.99948	.99950
3.3	.99952	.99953	.99955	.99957	.99958	.99960	.99961	.99962	.99964	.99965
3.4	.99966	.99968	.99969	.99970	.99971	.99972	.99973	.99974	.99975	.99976