Reg. No.:

Name :

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Continuous Assessment Test (CAT) – I – August 2020

Programme	:	**B.Tech – BAI, MIM**	Semester	:	**Fall 2020-2021**
Course	:	**Probability, statistics and reliability**	Code	:	**MAT3003**
Faculty	:	**Dr. Sayed Mohammed Zeeshan**	Slot/Class No.	:	**A11+A12+TA1/1100**
Time	:	**1½ hours**	Max. Marks	:	**50**

Answer all the Questions

Q. No.	Question Description	Marks
1	Ten men competed in the sprint race, their jerseys number were ranging from one to ten. Find the probability that if we add the two sprint racer's jersey number it will amount to an even number.	**5**
2	A sorcerer has a sack consisting of 5 balls numbered 1 to 5. If a ball of any number is taken out from that sack, then the same number ball magically appears back into the sack. Suppose you pulled out two balls back to back. If you add the number that appears on both balls, what is the probability that the sum will be greater than 6?	**5**
3	Rahul had 4 five-rupee coins and 8 ten-rupee coins in his wallet whereas Amit had 6 five-rupee coins and 10 ten-rupee coins in his wallet. (i) If a pickpocket stole a coin from any of them, then what is the probability that the stolen coin is worth 5 rupees?	**5**
	(ii) But when the police caught the thief, he found that the thief had stolen a 10 rupees coin, so what is the probability that it is Rahul's 10 rupees?	**5**
4	A chef has adopted a very unique way to attract people to his newly launched cake bakery. He has displayed a very large cake in front of his bakery and said that whoever guesses the weight of the cake correctly, will take it for free. The chef also indicated that the cake weighs from 1 pound to 5 pounds. Those who were guessing (X, random variable) the weight of the cake, those guesses were actually following the following pdf $f(x) = \begin{cases} \frac{(x-1)}{8} & 1 \le x \le 5 \\ 0 & \text{otherwise} \end{cases}$ (i) Calculate $P(X < 3)$ (ii) What is the probability that X will exceed 4?	**10**
5	There was a very lucky boy who used to correctly guess the answer to the multiple-choice questions with probability 1/3. Suppose he has attempted an exam of 10 questions. What is the probability of his answering at least three questions correctly? If anybody answers all questions right then that student will receive a certificate of excellence. What is the probability of the lucky boy to get the certificate of excellence?	**10**
6	If a Poisson variate X is such that 2P(x = 2) = 6 P(x = 3), find the following: (i) P(x = 0) (ii) Mean (iii) Variance of X (iv) Calculate $P(X > 2)$	**10**

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