

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: IMSc
BRANCH: QEDS

SEMESTER: I
SESSION: MO/2022

SUBJECT: ED107 PROBABILITY - I

TIME: 2 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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			CO	BL
Q.1	A picnic is arranged to be held on a particular day. The weather forecast says that there is 80% chance of rain on that day. If it rains the probability of a good picnic is 0.3 and if it does not the probability is 0.9. What is the probability that the picnic will be good?	[5]	1	
Q.2(a)	If A and B are two events, prove that $P(A B) \geq 1 - P(A^c)/P(B)$.	[2]	1	
Q.2(b)	Also, prove that $P(A B) = 1 - P(A^c B)$.	[3]	1	
Q.3	If the events E_1, E_2, \dots, E_n are independent and such that $P(E_i^c) = i/(i+1); i=1, \dots, n$, then find the probability that at least one of the n events occurs.	[5]	1	
Q.4	Compute the skewness and kurtosis measures for the Poisson distribution and then comment on their types.	[5]	2	
Q.5(a)	Find the moment generating function of a Geometric distribution with probability of success being p.	[3]	2	
Q.5(b)	Hence, compute the mean and variance of the distribution.	[2]	2	

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