Graphic Era HILL UNIVERSITY

Term Evaluation (Odd) Semester Examination September 2025

Roll no.. [redacted] .....

Name of the Course: MCA
Semester: First Semester
Name of the Paper: Probability and Statistics
Paper Code: TMC 111
Time: 1.5 hour

Maximum Marks: 50

Note:
(i) Answer all the questions by choosing any one of the sub-questions
(ii) Each question carries 10 marks.

Q1. (10 Marks)

a. State and prove Baye's theorem.

OR

b. The contents of urns I, II and III are as follows:
Urn I : 1 white, 2 black and 3 red balls
Urn II : 2 white, 1 black and 1 red balls and
Urn III : 4 white, 5 black and 3 red balls
One urn is chosen at random and two balls are drawn from it. They happen to be white and red. What is the probability that they come from urn I, II or III ?

Q2. (10 Marks)

a. A random variable X has the following probability distribution:

x	0	1	2	3	4	5	6	7
P(x)	0	k	2k	2k	3k	k^2	$2k^2$	$k+7k^2$

Find (i) the value of k (ii) P(X< 4) (iii) P(2< X< 6).

OR

b. Let a pair of dice be thrown and the random variable X denotes the sum of the numbers that appear on the two dice. Find the mean and Variance of X.

Q3. (10 Marks)

a. A die is thrown 7 times and it is required to find the probability that 5 will show (i) Exactly 3 times (ii) At least four times (iii) At most five times.

OR

b. If the mean and variance of a Binomial distribution are 4 and 2 respectively, find the probability of (i) at least 3 successes (ii) at most 4 successes (iii) exactly 2 success .

Q4. (10 Marks)

a. If X is a Poisson variate such that $P(X=2)=9P(X=4)+90P(X=6)$. Find the mean of X.

OR

b. Let X is a normally distributed variable with mean 30 and standard deviation 40 then find(i) $P(x<42)$ (ii) $P(x>25)$ (iii) $P(30<x<35)$.

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(10 Marks)

Q5.

a. Define the following : (i) Mutually exclusive events (ii) Exponential distribution (iii) Gamma distribution

OR

b. Six dice are thrown 729 times. How many times do you expect at least three die to show a five or six?