ANNAI VIOLET ARTS AND SCIENCE COLLEGE
DEPARTMENT OF MATHEMATICS

CONTINUOUS INTERNAL ASSESSMENT– I (ODD SEM)
Subject: Mathematical Statistics I

Class : II B.Sc Mathematics   **Exam Date : 07.09.22**
Max.Marks : 50   **Sub. Code: SM3AC**

PART A (5 x 2 = 10 MARKS)
Answer any FIVE questions

1. Define Probability
2. Find the Probability of getting an odd number less than three.
3. Prove that the Probability of an impossible event is zero.
4. If $P(A) = 1/3$, $P(B) = 1/2$, $P(A/B) = 1/6$. Find $P(B/A)$ and $P(B/\overline{A})$
5. Define Random variable with example.
6. What is mathematical Expectation.
7. State and prove linearity property.

PART B – (2 x 5 = 10 MARKS)
Answer any TWO questions

8. Find the probability of getting
   a) A Spade
   b) A Queen

9. If A, B, C are random events in a sample space and if they are pair wise independent and A is independent of B∪C then A, B, C are mutually independent. We have to show that $P(ABC) = P(A) P(B) P(C)$.

10. Find the mathematical expectation of the product of the points on 'n' dice

PART C – (3 x 10 = 30 marks)
Answer ALL questions

11. State and prove Baye's theorem

12. A random variable X has the following probability function

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

i) find k

   ii) evaluate   a) P(x< 6)
            b) P(x≥ 6)
         c) P(0 < x<5)
iii) If P(X ≤k) > 1/2, find the minimum value of k
iv) Determine the distribution function of x.

13. Given the probability density function of the continuous random variable x as follows
f(x) = $\begin{cases} kx(1-x) \ for \ 0 < x < 1 \\ \quad o \ otherwise \end{cases}$

find k and c.d.f