B.Sc. DEGREE EXAMINATION,NOVEMBER 2019
II Year III Semester
Mathematical Statistics - I

Time : 3 Hours **Max.marks :60**

Section A $(10 \times 1 = 10)$ Marks

Answer any **TEN** questions

1. Define probability of an event
2. Give an example for mutually exclusive event.
3. State axioms of probability of an event
4. Define continuous random variable
5. Define probability density function
6. Find the expectation of number of heads when two coins are tossed
7. Define Moment generating function of a random variable
8. Define Standard Normal distribution
9. Define Binomial distribution
10. State the mean and variance of poisson distribution
11. Define gamma distribution
12. Write the density function of Beta distribution of First kind

Section B $(5 \times 4 = 20)$ Marks

Answer any **FIVE** questions

13. State and prove addition theorem on probability
14. Two cards are drawn from a pack of playing cards. What is chance that they are (i) two king (ii) Two king or two queen
15. A continuous random variable X has p.d.f $f(x) = Ax^2, 0 \leq x \leq 1$. Find the value of A and find the probability of X lies between 0.2 and 0.5.
16. State and prove Multiplication theorem on mathematical expectation.
17. Find the variance of a Binomial distribution.
18. The random variable X has the following probability distribution

x	:	-3	6	9
P(x)	:	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{3}$

Find the value of $E(2x+1)^2$

19. Find the mgf of a gamma distribution

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. State and prove Baye's theorem
21. From a lot containing 25 items, 5 of which are defective. 4 items are chosen at random. Let x be the number of defectives found. Obtain the probability distribution of x (i) if the items are chosen with replacement. (ii) if the items are chosen without replacement .
22. State and prove Chebychev's inequality
23. State the importance and characteristics of Normal distribution.
24. If X is a gamma variate with parameter μ and Y is gamma variate with parameter λ then derive the distribution of X+Y.

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