B.Sc. DEGREE EXAMINATION,NOVEMBER 2018
II Year III Semester
Allied Paper I
MATHEMATICAL STATISTICS-I

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

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

Answer any **TEN** questions

1. State the axioms of probability.
2. Define complementary event.
3. What are the types of random variables?
4. Define probability distribution.
5. If C is a constant, E(C) = C.
6. Define r^{th} order central moment of a r.v.
7. Write any two examples of binomial distribution.
8. Write the mean and variance of poisson distribution .
9. Define gamma distribution
10. Write the definition of beta distribution of second kind.
11. Define sample space.
12. Define normal distribution.

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

Answer any **FIVE** questions

13. State and prove addition theorem of probability.
14. Write the properties of a distribution function.
15. Find the m.g.f of Uniform distribution.
16. The mean of a binomial distribution is 5 and standard deviation is 2. Determine the distribution.
17. Derive the mean of Beta distribution.
18. A bag contains 4 red, 5 white and 6 black balls. What is the probability that two balls drawn are red and black?
19. Find the area under the standard normal curve which lie

    (i)to the right of Z=2.7

    (ii)to the left of Z=1.73.

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

Answer any **THREE** questions

20. The contents of urns I, II and III are follows: 2 white, 3 black and 4 red balls; 3 white, 2 black and 2 red balls and 4 white, 1 black and 3 red balls. An urn is chosen at random and two balls are drawn. They happen to be white and red. What is the probability that they come from urns I, II and III.

21. A discrete random variable X has the following probability distribution.

X	0	1	2	3	4	5	6	7	8
P(X=x)	a	3a	5a	7a	9a	11a	13a	15a	17a

(i)Find the value of a

(ii)Find P(X<3), P(0<X<3) and P(X=3)

22. State and prove Addition theorem and multiplication theorem on Expectation of random variables.

23. Derive the mgf of the normal distribution and hence find its mean and variance.

24. Derive the mean and variance of Gamma distribuition.

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