



DCST201

Reg. No.

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II Semester B.Sc (NEP) Degree Examination, October - 2022

STATISTICS

Probability and distributions

(Fresh Scheme)

Paper: II



Time : 2½ Hours

Maximum Marks : 60

Instructions to Candidates:

- 1) Answer any eight subdivision from section A and any Three question from Section - B
- 2) Scientific calculator are allowed.

SECTION - A

I. Answer any eight sub-divisions from the following

(8×3=24)

1. a) Define
 - i) Random experiment
 - ii) Sample space
 - iii) Event.
- b) State the Axiomatic definition of probability and hence prove $P(A^1) = 1 - P(A)$
- c) If A, B and C are mutually independent events then show that (AUB) and C are also independent.
- d) Define
 - i) Random variable
 - ii) Discrete random variable
 - iii) Continuous random variable
- e) Define variance of a random variable x state two properties.
- f) If x is a random variable and a and b are any two constants then prove that.
 - i) $v(ax) = a^2 v(x)$
 - ii) $v(ax+b) = a^2 v(x)$

[P.T.O.]



- g) For the following p.m.f $P(x) = \frac{K}{2}$; $x = 0, 1$ find constant K, obtain mean and variance of x.
- h) Define Bernoulli distribution find its mean.
- i) Obtain mean of Gamma distribution.
- j) State the advantages of R-Software.

SECTION - B

II. Answer any THREE questions from the following. (3×12=36)

- 2.
 - a) Define conditional probability and establish multiplication theorem
 - b) State the axioms of probability and prove. $P(A \cap B) = P(B) - P(A \cap B)$
 - c) State and prove Baye's theorem of probability. (4+3+5)
 - 3.
 - a) Define distribution function of a random variable state its properties and prove any two of them.
 - b) State properties of Moment generating function (m.g.f) of a random variable and prove one of them. (6+6)
 - 4.
 - a) Obtain mean and variance of Binomial distribution.
 - b) Find the mean and variance of Geometric distribution (6+6)
 - 5.
 - a) Define Uniform distribution $U(a,b)$ and find its distribution functions.
 - b) Obtain mode of Normal distribution (6+6)
 - 6.
 - a) Mention the arithmetic operators used in R.
 - b) What are built in functions Discuss them with reference to R.
 - c) Mention the drawbacks of R (4+4+4)
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