First Year B.Sc. (Computer Science)
STATISTICS
CSST-112: MATHEMATICAL STATISTICS
(2019 Pattern) (Semester -I) (Paper-II)

[Time :2 Hours]   *[Max. Marks : 35]*

Instructions to the candidates:

1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*
3) *Use of calculator and statistical tables is allowed.*
4) *Symbols and abbreviations have their usual meaning.*

Q1) Choose the most appropriate alternative for each of the following: **[1 each]**

i) If X is a continuous random variable then $E(aX + b)$ = ……..

   a) $a E(X) + b$ b) $E(X) + b$

   c) $a E(X)$ d) $a^2 E(X)$

ii) The parameter of Poisson distribution is/are…

   a) P   b)   m

   c) μ d)   n, p

iii) If two events A and B are independent events defined on sample space Ω such that $P(A') = 0.3$ and $P(B') = 0.6$. Then $P(A' \cap B')$ = ….

   a) 0.1   b)   0.18

   c) 0.28   d)   0.9

iv) The probability of an impossible event is…..

   a) 1   b)   0.5

   c) $P(\Omega)$ d)   0

v) Which of the following is not a discrete random variable?

   a) Number of students present in the class

   b) Number of person have 'O-ve' blood group in blood donation camp.

   c) Number of attempts of student required to pass the examination.

   d) Weight of a new born baby.

P.T.O.

Q2) Attempt any TWO of the following: [5 each]

   a) Define partition of a sample space. Give an example of it. Also state Baye's theorem.

   b) Explain the following terms with an example:

      i) Deterministic experiment

      ii) Non-deterministic experiment

   c) A student has to answer 8 out of 10 questions in an examination.

      i) How many choices he has?

      ii) How many choices he has if he must answer the first 3 questions?

Q3) Attempt any TWO of the following: [5 each]

   a) State the p. m. f. of Geometric distribution. State its variance. Also state any two real life situations where this distribution is used.

   b) Define the following terms:

      i) Conditional probability

      ii) Sample space   iii) Continuous random variable

      iv) Exhaustive events   v) Variance of discrete random variable.

   c) Let $X \rightarrow B(n = 8, p = \frac{1}{4})$. Find i) $P(X = 3)$, ii) $P(X < 3)$.

Q4) Attempt any ONE of the following:

  A. a) i) State axioms of probability.

      ii) Explain the principles of counting.   [5]

    b) If A and B are independent events defined on a sample space Ω. Then show that   [5]

      i) A and B' are independent.

      ii) A' and B' are independent.

  B. a) State the p. m. f. of Poisson distribution with mean m. State its mean and variance. Also state the additive property of Poisson distribution. **[5]**

    b) Let X be random variable with following as the p. m. f. Find E(X) and Var(X).   **[5]**

X	0	1	2	3
P(x)	0.1	0.3	0.4	0.2

✱✱✱