

**B.Sc. (Part-II) (Semester-III) (CBCS (NEP2020) Examination, Oct. / Nov. 2023**  
**STATISTICS (Paper –V)**  
**Probability Distribution – I**  
**Sub. Code: 91570**

**Day and Date: Tuesday, 28/11/2023**

**Time: 10:30 a.m. to 12:30 p.m.**

**Total Marks: 40**

**Instructions:** i) All questions are compulsory .  
ii) Figures to the right indicate full marks.

**Q. 1. Choose the most correct alternative: (08)**

- 1) If  $(X_1, X_2) \sim \text{Tri}(n, p_1, p_2)$  then marginal probability distribution of  $X_1$  is...  
A)  $B(n, p_2)$                       B)  $B(n, p_1)$                       C)  $B(n, p_1+p_2)$                       D) none of these
- 2) If  $(X_1, X_2) \sim \text{Tri}(n, p_1, p_2)$  then  $\text{Cov}(X_1, X_2)$  is ...  
A)  $np_1p_2$                       B)  $-np_1p_2$                       C)  $np_1$                       D)  $np_2$
- 3) The variance of a continuous r. v.  $X$  is...  
A)  $\mu_3$                       B)  $\mu_2$                       C)  $\mu_4 - 3\mu_2$                       D) zero
- 4) If  $X \sim U(-4, 4)$  then value of  $P(X \leq 0)$  is ...  
A) 0.5                      B) 1                      C) 1/3                      D) 0
- 5) Let  $X \sim \beta_1(m, n)$  then  $1 - X$  is ---  
A)  $\beta_1(n, m)$                       B)  $\beta_1(m, n)$                       C)  $\beta_2(m, n)$                       D) None of these
- 6) If  $X \sim \beta_1(m=1, n=1)$  then distribution is...  
A)  $U(0, 1)$                       B)  $U(1,1)$                       C)  $G(1,1)$                       D) none of these
- 7) A r. v.  $X$  has an exponential distribution then  $P[X > 5 / X > 3]$  is...  
A)  $P(X > 3)$                       B)  $P(X > 9)$                       C)  $P(X > 6)$                       D)  $P(X > 2)$
- 8) Mean of the Laplace distribution with parameter  $\mu$  and  $\theta$  is...  
A)  $\mu$                       B)  $\theta$                       C)  $2/\theta$                       D)  $\mu + \theta$

**Q.2. Attempt any Two of the following (16)**

- 1) A continuous r. v.  $X$  has following p.d.f.  
$$f(x) = \begin{cases} C \cdot x(2-x) & 0 < x < 2 \\ 0 & \text{otherwise} \end{cases}$$
  
Find    a)  $C$                       b)  $E(X)$                       c)  $E(X^2)$                       d) Variance
- 2) Define Continuous Uniform distribution and find its mean and variance
- 3) Define Gamma distribution and find its mode

**Q.3. Attempt any four from the following: (16)**

- 1) For a univariate continuous r.v.  
Define i) Mean    ii) Median    iii) Mode
- 2) A continuous r. v.  $X$  has p.d.f.  
$$f(x) = \begin{cases} 2x & 0 \leq x \leq 1 \\ 0 & \text{otherwise} \end{cases}$$
  
Find the probability distribution of  $Y = 3X + 1$
- 3) If  $(X_1, X_2) \sim \text{Tri}(n, p_1, p_2)$  then find distribution of  $X_1 + X_2$
- 4) If  $(X_1, X_2) \sim \text{BP}(\lambda_1, \lambda_2, \lambda_3)$  then find joint p.g.f. of  $(X_1, X_2)$
- 5) Find median of exponential distribution.
- 6) Find mean of beta distribution of second kind.

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