SET: I

B.Sc. (Part-II) (Semester-IV) (CBCS (NEP2020)) Examination, March/April 2024
Balasaheb Desai College, Patan
STATISTICS
Sub. Code: 94263
Probability distribution–II (Paper – VII)

Day and Date: Friday 12/04/2024 **Total Marks: 40**
Time : 02:30 p.m. to 04:30 p.m. **Period: 2 Hours**
Total Pages: 02

Instructions : ***i) All questions are compulsory .***

ii) Figures to the right indicate full marks.

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

1) The mean of normal distribution is 40 then its mode is…

a) 25 b) 40 c) 50 d) none of these

2) If $X \sim N(\mu, \sigma^2)$ then $Z = (X-\mu)/\sigma$ is…

a) $N(\mu, \sigma^2)$ b) N(0, 1) c) $N(0, \sigma)$ d) N(0,2)

3) If X and Y are independent variables then f(x, y)=….

a) f(x) b) f(y) c) f(x)+f(y) d) f(x)f(y)

4) If (X,Y) be the bivariate continuous r.v.s with joint p.d.f. f(x,y) then joint p.d.f. of U=g1(x,y) and V=g2(x,y) is g(u,v) =……..

a) f(x).f(y) where x and y are in terms of u and v

b) f(x,y) where x and y are in terms of u and v

c) f(x,y)|J| where x and y are in terms of u and v

d) None of these

5) The joint p.d.f. of (X, Y) is given by

$$f(x,y) = \begin{cases} 1 & 0 \le x,y \le 1 \\ 0 & otherwise \end{cases}$$

Let transformation U = XY and V= Y then range of V is…

a) 0 to 1 b) 0 to v c) 0 to ∞ d) none of these

6) If (X,Y) be the bivariate continuous r.v. then E{E(X|Y)}=…

a) E(X|Y) b) E(X) c) E(Y) d) none of these

7) If X has chi-square distribution with 10 d.f. then its variance is…

a) 10 b) 20 c) 100 d) 5

8) The F distribution is invented by…

a) Snedecor b) Karl Pearson c) Gosset d) none of these

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

1 Define Standard Normal distribution and find its mean and variance

2 Derive the probability density function (p.d.f.) of Chi-square distribution

3 If X and Y are two independent Gamma variables then find distribution of X/ (X+Y)

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

1 Find median of normal distribution

2 State properties of Normal probability curve

3 For Bivariate Continuous r.v. Define

i) Marginal probability density function

ii) Conditional probability density function

4 IF (X, Y) be the bivariate continuous r.v then Show that

E(X+Y) =E(X)+E(Y)

5 The joint p.d.f. of (X, Y) is given by

$$f(x,y) = \begin{cases} 4x(1-y) & 0 \le x,y \le 1 \\ 0 & otherwise \end{cases}$$

Then find marginal distribution of X and Y

6 Find mean of t distribution

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