

b) State whether the given statement is true or false in each of the following: [1 each]

- i) $E(c) = 0$ where c is any constant.
- ii) Normal distribution is mesokurtic

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

a) Let X is continuous r.v. with p.d.f.

$$f(x) = 4(1-x)^3 ; 0 < x < 1$$
$$= 0 \quad ; \text{ otherwise}$$

Find :

- i) $E(x)$ and
- ii) distribution of $Y = \frac{X}{1-X}$.

b) Obtain point of inflexion of normal probability curve.

c) If X_1, X_2 are *i.i.d.* $Exp(1)$ then show that $Y = \min(X_1, X_2) \rightarrow Exp(2)$.

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

a) If X is a r.v. taking values $(-a, a)$ has p.d.f. $f(x)$ then find the p.d.f. of $Y = |X|$.

b) Obtain mode of $N(\mu, \sigma^2)$.

c) The joint p.d.f. of a two dimensional continuous r.v. (X, Y) is

$$f(x, y) = \frac{8}{9}xy \quad ; 1 \leq x \leq y \leq 2$$
$$= 0 \quad ; \text{ otherwise}$$

Find :

- i) Marginal distribution of X .
- ii) Conditional distribution of Y given $X = x$.

Q4) Attempt any one of the following :

- a) i) The joint p.d.f. of a two dimensional continuous *r.v.* (X, Y) is
 $f(x, y) = 2 ; 0 < x < y < 1$
 $= 0 ; \text{ otherwise}$
Find $E(Y|X = x)$ [7]
- ii) If $X \rightarrow U[a, b]$ then find median of X. [3]
- b) i) The p.d.f. of a continuous *r.v.* X is
 $f(x) = \frac{1}{2} ; -1 \leq x \leq 1$
 $= 0 ; \text{ otherwise}$
Find *m.g.f.* of X. Also find $E(x)$. [5]
- ii) State and prove lack of memory property of exponential distribution. [5]

