

- Use of Scientific Non-Programmable calculator is allowed

Q.1) a) State true or false for each of the following statements. Justify your answer. (10)

- 1) False $P(a < X < b) = P(a \leq X \leq b)$ (02)
- 2) False (02)
- 3) False : Continuous > Rectangular (02)
- 4) True (02)
- 5) False : rejection region (02)

Q.1) b) Define the following with the help of example. (10)

- 1) (02)
- 2) (02)
- 3) (02)
- 4) (02)
- 5) (02)

Q.2) Attempt any TWO sub-questions.

- 1) Each 02 marks (10)
- 2) Each 02 marks (10)
- 3) (i) $C = 0.25 > 02$ marks (ii) $E(X) = 4/3 > 02$ marks (10)
(iii) $V(X) = 64/45 > 04$ marks (iv) $P(X=2) = 0 > 02$ marks
- 4) i. Define PDF > 02 marks properties > 02 marks (10)
ii. Define CDF > 02 marks properties > 04 marks

Q.3) Attempt any TWO sub-questions.

- 1) Define Continuous Uniform Distribution > 02 Mean > 02 Variance > 03 Median > 03 (10)
- 2) i. Define Normal Distribution > 02. State its properties > 05 (10)
ii) $P = X+Y-Z \sim N(0,38)$ b) $Q = X-Y \sim N(-10, 13)$ c) $R = X-Y+3 \sim N(-7,13)$
Each 01 mark
- 3) Define Exponential Distribution > 02 mean > 03 variance > 05 (10)
- 4) i. a) $P(\text{exceed 30 hours}) = 0.4493$ b) $P(\text{less than 35 hours}) = 0.6988$. (10)
ii. 225 **Marks?**

Q.4) Attempt any TWO sub-questions.

- 1) (10)
- 2) Each 01 mark (10)
- 3) (10)
- 4) Each 05 marks (10)

Q.5) Attempt any four sub-questions.

(20)

- 1) i) No >02 ii) Yes > 03 (05)
- 2) i. $P(X < 0.25) = F(0.25) = 0.3672$ (05)
 ii. $f(x) = \frac{3}{2}(1-x^2)$

- 3) (05)
- 4) (05)
- 5) (05)
- 6) (05)
- 7) (05)