



DEPARTMENT OF STATISTICS
Visva-Bharati University
Probability & Probability Dist. (Code: CC-3)

Internal Test: III
Date: 27/07/21 (Tuesday)

Time: 50 + 10 Minutes

Attempt All Questions

Total Marks: 10

1. A random variable X has probability density function $f(x) = \alpha x e^{-\beta^2 x^2}$, $x > 0, \alpha > 0, \beta > 0$. If $E(X) = \frac{\sqrt{\pi}}{2}$, determine α and β . [3]
 2. If X_1, X_2 are independent RVs. Then using MGF show that $X_1 \sim Bin(n_1, p)$, $X_2 \sim Bin(n_2, p) \Rightarrow X_1 + X_2 \sim Bin(n_1 + n_2, p)$. [4]
 3. Let X be a continuous random variable with the probability density function $f(x) = \frac{e^x}{(1+e^x)^2}$, $-\infty < x < \infty$. Then $E(X)$ and $P(X > 1)$, respectively, are
(A) 1 and $(1+e)^{-1}$. (B) 0 and $2(1+e)^{-2}$. (C) 2 and $(2+2e)^{-1}$. (D) 0 and $(1+e)^{-1}$. [3]
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