

# Minor- III: Probability and Statistics

College For Integrated Studies  
University of Hyderabad

November 12, 2025

**Duration:** 60 minutes  
**Maximum Score:** 20 points

**Instructor:** Dharmendra Kumar  
**Course Code:** MM 212

---

**Instructions:** Answers without justification will receive a score of zero.

---

1. Suppose that the distribution function of  $X$  is given by

$$F(b) = \begin{cases} 0 & b < 0 \\ \frac{b}{4} & 0 \leq b < 1 \\ \frac{1}{2} + \frac{b-1}{4} & 1 \leq b < 2 \\ \frac{11}{12} & 2 \leq b < 3 \\ 1 & b \geq 3. \end{cases}$$

Find:

(a)  $P(X = 2)$ , [5]

(b)  $P(\frac{1}{2} < X < \frac{3}{2})$ . [5]

2. If  $E[X] = 1$  and  $\text{Var}(X) = 5$ , then find:

(a)  $E[(2 + X)^2]$ , [5]

(b)  $\text{Var}(4 + 3X)$ . [5]

All the best !