United International University

School of Science and Engineering

CT-02 Trimester: Fall-2020 Section: B

Course Title: Probability and Statistics

Course Code: Stat 205 Marks: 20 Time: 30 Mins

(Answer all the questions)

1. Consider the ***mgf*** of random variable $\boldsymbol{X}$ is $\boldsymbol{M(t) = \frac{0.4e^t}{1-0.6e^t}}$. How $\boldsymbol{X}$ is distributed? Find the corresponding ***pmf***, **mean**, **variance**, $\boldsymbol{E[X(3-5X)-7]}$ and $\boldsymbol{Var(3-2X)}$. **[10]**

2. A random variable $\boldsymbol{X}$ has a binomial distribution with mean $\boldsymbol{12.5}$ and variance $\boldsymbol{4.55}$. How is $\boldsymbol{X}$ distributed and find $\boldsymbol{P(X \geq 1)}$, where $\boldsymbol{\mu = np}$ & $\boldsymbol{\sigma^2 = np(1-p)}$. **[5]**

3. If $\boldsymbol{X}$ is a binomial distribution with $\boldsymbol{b(12, 0.35)}$, how is $\boldsymbol{X}$ distributed? Find $\boldsymbol{P(X \leq 2)}$ and $\boldsymbol{P(3 \leq X < 6)}$. **[5]**