United International University

School of Science and Engineering

CT-02 Trimester: Summer-2020 Section: C

Course Title: Probability and Statistics

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

(Answer all the questions)

1. If the ***mgf*** of a random variable $\boldsymbol{X}$ is $\boldsymbol{M(t) = \frac{4}{10}e^{t} + \frac{3}{10}e^{2t} + \frac{2}{10}e^{3t} + \frac{1}{10}e^{4t}}$, 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 $\boldsymbol{10.5}$ and variance $\boldsymbol{3.15}$. How $\boldsymbol{X}$ is 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 $\boldsymbol{b(10, 0.35)}$, how is $\boldsymbol{X}$ distributed? Find $\boldsymbol{P(X \leq 2)}$ and $\boldsymbol{P(3 \leq X < 7)}$. **[5]**