Ministry of Higher Education & Scientific Research
Salahaddin University-Erbil
College of Administration and Economics
Department: Statistics
Stage: 2nd class

Subject: Set theory
Date: 2 / 9 /2019
Time: 3 Hours

Final Exam: Second Trial
2018 – 2019

Q1. How many words, with or without meaning can be made from the letters of the word **MONDAY**, assuming that no letter is repeated, if. (i) 4 letters are used at a time, (ii) all letters are used at a time, (iii) all letters are used but first letter is a vowel?

Q2. How many **4 digit** numbers **greater than 4000** can be formed using numbers **1, 2, 3, 4, 5, 6** with the following conditions:
(i) Without repetition of digits.   (ii) Even numbers without repetition.

Q3. Five cards are drawn from a pack of playing cards. Find the probability of: (i) **four** aces and **one** is a king? (ii) **At least one queen** of the **red** is drawn? (iii)**Two** pictures of **red card** and **others** are **club** cards?

Q4. Urn A contains **5 black, 6 pink** and **8 red** marbles, **Urn B** contains **4 black, 6 pink** and **5 red** marbles , and **Urn C** contains **3 black, 7 pink** and **5 red** marbles. **(i)** If a marble is drawn from **each urn**, what is the probability that **all of the same color**? **(ii)** If **two** marbles are drawn from **each urn**, what is the probability that **all six marbles** are **of the same color**? **(iii)** If we **select a Urn** at random and then **draw a marble** at random. What is the probability that **a marble is a pink**?

Q5. Let X be a random variable with **p.m.f** is given by:

$$p(x) = \begin{cases} \dfrac{c(x+1)^2}{10} & x = 0,1,2,3 \\ \\ 0 & otherwise \end{cases}$$

1- Find the value of c.   2- Find Cumulative distribution function $F(x)$.

3- Find the moment generating function $M_X(t)$.

Q6. The continuous random variable X has probability density function $f(x)$ given by:

$$f(x) = \begin{cases} \dfrac{3}{8}(4x - 2x^2) & 0 \le x \le 2 \\ 0 & o.w \end{cases}$$

1- Find $E(X^2)$.   2- Find the cumulative distribution function $F(x)$.

Good Luck

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