**Quiz 1**

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| STAT 105  | Academic year 1441 H  | Send you answer before 12/6/1441 -9:00PM |
| Statistical Methods |  Second Semester | By E-mail for: wemam.c@ksu.edu.sa |

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| **Section No.** |  | **رقم الشعبة** |

Question (1) Consider density function: $f\left(x\right)=\left\{\begin{array}{c}3x^{2}, 0<x<1\\0, elsewhere\end{array}\right.$

1. The mean of random variable, μ is:

|  |  |  |  |
| --- | --- | --- | --- |
| A | B | C | D |
| 0.625 | 0.75 | 0.5625 | 0.25 |

1. *P*(*X* < 0.5) is:

|  |  |  |  |
| --- | --- | --- | --- |
| A | B | C | D |
| 0.105 | 0.3125 | 0.875 | 0.125 |

1. *P*(0.4 < *X* < 0.9) is:

|  |  |  |  |
| --- | --- | --- | --- |
| A | B | C | D |
| 0.665 | 0.5423 | 0.5825 | 0.335 |

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Question (2) Suppose it is known that 80% of the people exposed to the flu virus will contract the flu. Out of a family of six exposed to the virus,

1. The probability that no one will contract the flu is:

|  |  |  |  |
| --- | --- | --- | --- |
| A | B | C | D |
| 0.0064 | 0.000064 | 0.00073 | 0.00032 |

1. The probability that all will contract the flu is:

|  |  |  |  |
| --- | --- | --- | --- |
| A | B | C | D |
| 0.2621 | 0.1176 | 0.3277 | 0.7379 |

1. The probability that at least two will contract the flu is:

|  |  |  |  |
| --- | --- | --- | --- |
| A | B | C | D |
| 0.9933 | 0.9891 | 0.9984 | 0.0016 |

1. The expected number and the variance for the people who will contact the flu virus are:

|  |  |  |  |
| --- | --- | --- | --- |
| A | B | C | D |
| 1.26 and 4.2 | 4.2 and 1.26 | 0.96 and 4.8 | 4.8 and 0.96 |

Question (3) in a shipment of 20 refrigerators of a certain type, there are 4 refrigerators that have defective compressors while the others are perfect. An inspector selected without replacement a sample of 4 refrigerators to be examined, and the inspector accepts the shipment if all refrigerators are perfect. Let the random variable X represents the number of defective compressors in the sample, then:

1. The random variable X follows:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | Binomial | (B) | Poisson | (C) | Hypereometric  | (D) | Normal |

1. The probability  is

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | 0.1486 | (B) | 0.3472 | (C) | 0.5423 | (D) | 0.1294 |

1. The probability that the shipment will be rejected is:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | 0.42 | (B) | 0.4623  | (C) | 0.3756 | (D) | 0.6244 |

1. The expected number  of defective compressors is:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | 2 | (B) | 0.8 | (C) | 0.2 | (D) | 4 |

1. The standard deviation  of defective compressors is:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | 0.264 | (B) | 0.521 | (C) | 0.7341 | (D) | 0.13474 |

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Question (4) for a chi-squared distribution when the degree:

1. the value such that  is:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | 6.57 | (B) | 23.68 | (C) | 31.32 | (D) | 41.40 |

1. the value such that is:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | 29.14 | (B) | 23.68 | (C) | 21.06 | (D) | 2.168 |

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Question (5) For the *F* distribution with degrees 8 and 6, then:

1. the value such that  is:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | 1.23 | (B) | 0.1618 | (C) | 0.2409 | (D) | 0.2793 |

1. the value such that  is:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | 6.37 | (B) | 8.10 | (C) | 6.37 | (D) | 4.15 |

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Question (6) A random variable T with degree 17, and, then:

1. the value of *k* is:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | 1.069 | (B) | 1.74 | (C) | 2.567 | (D) | 0.534 |

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Question (7) if the probability to find typing errors in a given page of a book is 0.07 and is independent from page to page. Suppose we select a sample of 30 pages and define the variable X= the number of pages with typing errors in the sample, then:

1. the variable X follows:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | Binomial | (B) | Poisson | (C) | Hypereometric | (D) | Normal |

1. the probability  is

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | 0.2133 | (B) | 0.5333 | (C) | 0.8733 | (D) | 0.1927 |

1. the probability is

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | 0.5381 | (B) | 0.7381 | (C) | 0.35125 | (D) | 0.6381 |

1. The values of  of the number of pages contain errors in the sample are:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | (30, 1.953) | (B) | (2.1, 1.953) | (C) | (30, 0.07) | (D) | (0.93, 2.1) |

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Question (8) Let  is the number surgeries in a hospital per day is modeled by a Poisson distribution with rate  surgeries per day. Then:

1. The probability that tomorrow it will be exactly 8 surgeries is:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | 0.11882 | (B) | 0. 3423 | (C) | 0.1736 | (D) | 0.8264 |

1. The probability that it will be next 12 hours exactly 3 surgeries is:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | 0.22184 | (B) | 0.77815 | (C) | 0.25432 | (D) | 0.2345 |

1. the probability that there will be next 6 hours surgeries is:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | 0.2765 | (B) | 0.7545 | (C) | 0.8030 | (D) | 0.19691 |

1. The standard deviation of surgeries in 3 days is:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (A) | 1.0 | (B) | 18.5 | (C) | 6.5 | (D) | 4.416 |

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