الفصل الدراسى : الأول 1435 / 1434

الاختبار: الفصلي الثاني

اسم المقرر ورمزه : 106 احص

جـامعة الملك سـعود

كلية العلوم

قسم الإحصاء وبحوث العمليات

الخميس **4 / 1 / 1434 هـ** الساعة **:00 12–1:00**

**اسم الطالبة : -----------------------------------------------------------------------------------**

**رقم الطالبة : -----------------------------------------------------------------------------------**

**رقم الشعبة : ----------------------------- رقم التسلسل : ---------------------------------------**

**أستاذة المقرر : ---------------------------------------------------------------------------------**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Question*** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| ***Answer*** |  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Question*** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** |
| ***Answer*** |  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- |
| ***Question*** | **21** | **22** | **23** | **24** | **25** |
| ***Answer*** |  |  |  |  |  |

***Good Luck***

**Answer the following questions:**

**Question (1)**

In a population of adult patients with a certain disease, let M "is a man" and H= "has a heart disease". We have the following (incomplete) Venn diagram:

**M**

**H**

**0.4**

**0.3**

**0.1**

**If we randomly choose one patient, find the probability that the patient chosen:**

1. **Is a man and has a heart disease: P(MH)=1-(0.4+0.3+0.1)**

(a) 0.3 (b) 0.2 (c) 0.1 (d) 0.5 (e) None of these

1. **Is a women: : P()=0.4+0.1**

(a) 0.2 (b) 0.4 (c) 0.3 (d) 0.5 (e) None of these

1. **Dose not have a heart disease: P()=0.3+0.1**

(a) 0.4 (b) 0.2 (c) 0.3 (d) 0.6 (e) None of these

1. **Dose not have a heart disease and is a women: ()=0.1**

(a) 0.3 (b) 0.2 (c) 0.1 (d) 0.5 (e) None of these

1. **He is a man or has heart disease: P(MH)=P(M)+P(H)-P(MH)=(0.3+0.2)+(0.4+0.2)-0.2**

(a) 0.1 (b) 0.4 (c) 0.7 (d) 0.9 (e) None of these

1. **Is a women and has a heart disease: P()=0.4**

(a) 0.4 (b) 0.2 (c) 0.3 (d) 0.6 (e) None of these

1. **Is a man knowing that he has a heart disease: P(MH)=**

(a) 0.4 (b) 0.2 (c) 0.3 (d) 0.6 (e) None of these

**Question (2)**

Let the following table represents the **cumulative probability distribution** of a discrete random variable X. **From the table find**

|  |  |  |  |
| --- | --- | --- | --- |
| **X** |  | **P(X=x)** | **x.P(X=x)** |
| **2** | **0.2** | **0.2** | **0.4** |
| **4** | **0.5** | **0.3** | **1.2** |
| **8** | **0.7** | **0.2** | **1.6** |
| **16** | **1** | **0.3** | **4.8** |

1. **P(X = 4) =**

(a) 0.4 (b) 0. 3 (c) 0.5 (d) 0.7 (e) None of these

1. **The expected number of X is =**

(a) 5 (b) 3 (c) 7 (d) 8 (e) None of these

1. =P(X=8)+P(X=16)

(a) 0. 5 (b) 0.3 (c)0. 7 (d) 0.8 (e) None of these

**Question (3)**

In a certain population, it is known that **30%** of the them have two jobs. Let X= number of people who have two jobs. If **a sample of 15 people** of this population are selected randomly, then

1. **The probability distribution formula of the random variable X, is given by**

(a) (b)

(c) (d)

(e)

1. **The probability that at least one person has two jobs**

(a) 0.876 (b) 0.995 (c) 0.667 (d) 0.206 (e) None of these

1. **The probability that 5 people have two jobs**

(a) 0.876 (b) 0.995 (c) 0.667 (d) 0.206 (e) None of these

1. **The variance of is**

(a) 3.15 (b) 5.14 (c) 15 (d) 4.50 (e) None of these

**Question (4):**

The **average** of traffic accidents in a certain street is **6** accidents per **month**. Let the random variable X=the number of traffic accidents per **month**.

**(\*)** For any given **month** in this street:

1. **P(X=3)**

(a) 0.09 (b) 0.94 (c) 0.68 (d) 0.43 (e) None of these

1. The **mean** of the random variable is

(a) 1/30 (b) 30 (c) 6 (d) 1/6 (e) None of these

**(\*\*)** For any given **2 months** in this street:

1. The probability that **exactly 6** accidents will occur is (a) 0.23 (b) 0.21 (c) 0.03 (d) 0.12 (e) None of these
2. The **variance** of the random variable is

(a) 5 (b) 6 (c) 2 (d) 12 (e) None of these

**Question (5):**

1. **If you know that the events A and B are independents, then P(B|A) is**

(a) > P(B) (b) = P(B) (c) <P(B) (d) 1- P(B) (e) None of these

1. **If you know that the events A and B are disjoint, then P(AB) =**

(a) P(A)\*P(B) (b) P(A)+ P(B) (c) 0 (d) 1 (e) None of these

1. **If you know that are all possible equally likely** outcomes of an experiment,

**then P() =**

(a) 0 (b) 1 (c) 1/10 (d) 2/10 (e) None of these

**Question (6):**

**A population of cans of juice (from different companies) is classified by the type of juice and the level of potassium**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Type of juice | | | | | |
| **Potassium Level** |  | Tomato  (T) | Orange  (O) | Apple  (A) | Pineapple  (P) | Total |
| Low (L) | **10** | **15** | **40** | **35** | **100** |
| Medium (M) | **40** | **60** | **55** | **65** | **220** |
| High (H) | **75** | **50** | **30** | **25** | **180** |
| Total | **125** | **125** | **125** | **125** | **500** |

**If one of these cans is randomly chosen then:**

1. P()=

(a)0.02 (b) 0.43 (c) 0.45 (d) 0.64 (e) none of these

1. The marginal probability of "O" is

(a) 0 (b) 0.75 (c) 0.25 (d) 0.5 (e) none of these

1. P(H|P )=

(a) 0.20 (b) 0.75 (c) 0.50 (d) 0.48 (e) none of these

1. P()=

(a)0.32 (b) 0.03 (c) 0.14 (d) 0.00 (e) none of these

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**End of quetstions**