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| **ADI-SOYADI:****NUMARASI:****İMZA:**  |

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| **SORU** | **1** | **2** | **3** | **4** | **5** | **TOPLAM** |
| **PUAN** |  |  |  |  |  |  |

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**İST.377 SİMÜLASYON** **FİNAL SINAV SORULARI****08.01.2020**

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| **YÖNERGE:** | 1. **Bütün sorularda** $U\_{i}$ **değerlerini kullanınız.**
2. **Her soru eşit ve 20 puandır.**
3. **Gerekirse işlemlerde noktadan sonra üç basamak almanız yeterlidir.**
 |
| ***VERİ:***

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| $U\_{i}$***:*** | **0.013** | **0.115** | **0.237** | **0.310** | **0.423** | **0.536** | **0.609** | **0.709** | **0.812** | **0.968** |

 |

**SORU–1: Olasılık fonksiyonu,** $f\left(x\right)=\left\{\begin{array}{c}\frac{2x-1}{32}, x=3, 4, 5, 6\\0, --- \end{array}\right.$ **olan dağılımın ortalama ve varyansını tahmin ediniz.****SORU–2:** **Başarı olasılığı** $p=0.80$ **olan geometrik dağılımın ortalama ve varyansını tahmin ediniz.****SORU–3: Olasılık yoğunluk fonksiyonu,** $f\left(x\right)=\left\{\begin{array}{c}\frac{x}{2}, 0<x<2\\0, --- \end{array}\right.$ **olan dağılımın ortalama ve varyansını tahmin ediniz.****SORU–4: Olasılık yoğunluk fonksiyonu,** $f\left(x\right)=\left\{\begin{array}{c}\frac{1}{5}e^{- \frac{x}{5}}, x>0\\0, --- \end{array}\right.$ **olan üstel dağılımın ortalama ve varyansını tahmin ediniz.****SORU-5: Olasılık yoğunluk fonksiyonu,** $f\left(x\right)=\left\{\begin{array}{c}\frac{3}{x}\left(\frac{10}{x}\right)^{3}, x\geq 10\\0, --- \end{array}\right.$ **olan Pareto dağılımının ortalama ve varyansını tahmin ediniz.** Başarılar Dilerim.Prof. Dr. Kamil ALAKUŞ |

 |

**CEVAPLAR**

**Cevap-1:** Üretici fonksiyon,

$$x\_{i}=\left\{\begin{array}{c}3, eğer u\_{i}<0.156\\4, eğer 0.156\leq u\_{i}<0.375\\5, eğer 0.375\leq u\_{i}<0.656 \\6, eğer u\_{i}\geq 0,656\end{array}\right.$$

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| $$u\_{i}$$ | 0,013 | 0,115 | 0,237 | 0,310 | 0,423 | 0,536 | 0,609 | 0,709 | 0,812 | 0,968 | $$\sum\_{}^{}x\_{i}$$ | $$\overbar{x}$$ | $$s^{2}$$ |
| $$x\_{i}$$ | 3 | 3 | 4 | 4 | 5 | 5 | 5 | 6 | 6 | 6 | 47 | 4,7 |  |
| $$x\_{i}^{2}$$ | 9 | 9 | 16 | 16 | 25 | 25 | 25 | 36 | 36 | 36 | 233 | 12,1 | 1,21 |

**Cevap-2:** Üretici fonksiyon, $x\_{i}=Tamsayı\left\{\left[ln\left(u\_{i}\right)/ln\left(0.2\right)\right]+1\right\}$

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| $$u\_{i}$$ | 0,013 | 0,115 | 0,237 | 0,310 | 0,423 | 0,536 | 0,609 | 0,709 | 0,812 | 0,968 | $$\sum\_{}^{}x\_{i}$$ | $$\overbar{x}$$ | $$s^{2}$$ |
| $$x\_{i}$$ | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 13 | 1.3 |  |
| $$x\_{i}^{2}$$ | 9 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 21 | 4.1 | 0,411 |

**Cevap-3:** Üretici fonksiyon, $x\_{i}=2\sqrt{u\_{i}}$

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| $$u\_{i}$$ | 0,013 | 0,115 | 0,237 | 0,310 | 0,423 | 0,536 | 0,609 | 0,709 | 0,812 | 0,968 | $$\sum\_{}^{}x\_{i}$$ | $$\overbar{x}$$ | $$s^{2}$$ |
| $$x\_{i}$$ | 0,228 | 0,678 | 0,974 | 1,114 | 1,301 | 1,464 | 1,561 | 1,684 | 1,802 | 1,968 | 12,773 | 1,277 |  |
| $$x\_{i}^{2}$$ | 0,052 | 0,460 | 0,948 | 1,240 | 1,692 | 2,144 | 2,436 | 2,836 | 3,248 | 3,872 | 18,928 | 2,612 | 0,261 |

**Cevap-4:** Üretici fonksiyon, $x\_{i}=-5\*ln\left(u\_{i}\right)$

|  |  |  |  |  |  |  |  |  |  |  |  |
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| $$u\_{i}$$ | 0,013 | 0,115 | 0,237 | 0,310 | 0,423 | 0,536 | 0,609 | 0,709 | 0,812 | 0,968 | $$\sum\_{}^{}x\_{i}$$ |
| $$x\_{i}$$ | 21,714 | 10,814 | 7,198 | 5,856 | 4,302 | 3,118 | 2,480 | 1,719 | 1,041 | 0,163 | 58,406 |
| $$x\_{i}^{2}$$ | 471,499 | 116,945 | 51,818 | 34,292 | 18,506 | 9,723 | 6,149 | 2,957 | 1,084 | 0,026 | 712,999 |

|  |  |
| --- | --- |
| $$\overbar{x}$$ | $$s^{2}$$ |
| 5,841 |  |
| 371,877 | 37,188 |

**Cevap-5:** Üretici fonksiyon, $x\_{i}=10/u\_{i}^{1/3}$

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| $$u\_{i}$$ | 0,013 | 0,115 | 0,237 | 0,310 | 0,423 | 0,536 | 0,609 | 0,709 | 0,812 |
| $$x\_{i}$$ | 42,529 | 20,564 | 16,159 | 14,776 | 13,322 | 12,311 | 11,798 | 11,215 | 10,719 |
| $$x\_{i}^{2}$$ | 1808,719 | 422,865 | 261,117 | 218,319 | 177,462 | 151,550 | 139,184 | 125,768 | 114,894 |

|  |  |  |  |
| --- | --- | --- | --- |
| 0,968 | $$\sum\_{}^{}x\_{i}$$ | $$\overbar{x}$$ | $$s^{2}$$ |
| 10,109 | 163,500 | 16,350 |  |
| 102,192 | 3522,069 | 848,857 | 84,886 |