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**GARISSA UNIVERSITY**

**UNIVERSITY EXAMINATION 2019/2020 ACADEMIC YEAR TWO**

**SECOND SEMESTER EXAMINATION**

**SCHOOL OF BUSINESS AND ECONOMICS**

**FOR THE DEGREE OF BACHELOR OF BUSINESS MANAGEMENT**

**COURSE CODE: ECO 213**

**COURSE TITLE: ECONOMIC STATISTICS II**

**EXAMINATION DURATION: 2 HOURS**

**DATE: 17/12/2020 TIME: 3.00-5.00 PM**

**INSTRUCTION TO CANDIDATES**

* **The examination has FIVE (5) questions**
* **Question ONE (1) is COMPULSORY**
* **Choose any other TWO (2) questions from the remaining FOUR (4) questions**
* **Use sketch diagrams to illustrate your answer whenever necessary**
* **Do not carry mobile phones or any other written materials in examination room**
* **Do not write on this paper**

**This paper consists of FOUR (4) printed pages *please turn over***

**QUESTION ONE (COMPULSORY)**

1. Define the following terms as used in Economic Statistics
2. Degrees of freedom
3. Level of significance
4. Unbiased Estimator
5. An interval estimate **[4 marks]**
6. On experience it is found that Mr. Omondi is late for lecturers on four days of 30 working days. Let X denotes the number of times Mr. Omondi will be late for lecturers in the next 60 working days. Determine P(6< X< 9) **[5 marks]**
7. For large population of normally distributed account balance, the mean balance is u=15000 shillings with standard deviation 3500. What is the probability that a randomly account has a balance that exceed 16000 shillings **[3 marks]**
8. Below is a sample of earnings (in thousands of shillings) of fast food outlets in Kangemi in a month: 45, 38, 30, 37, 54, 49, 65, 40, 33, 28, 36, 48, 53 and 55 **[6 marks]**
9. Estimate the average earning of a fast food outlet in Kangemi
10. Determine the 95% confidence interval of a food outlet in Kangemi in a month

**[6 marks]**

1. A small local bank has 1450 individual savings accounts with an average balance of 3000 shillings and a standard deviation of 1200 shillings. If the bank takes a random sample of 100 accounts, what is the probability that the average saving for these 100 accounts will be below 2800 shillings **[6 marks]**

**QUESTION TWO (20 Marks)**

1. For large population of normally distributed account balance, the mean balance is Ksh. 15000 with standard deviation of Ksh 3500. What is the probability that a randomly selected account has a balance that
2. Exceed Kshs. 16000
3. Lies between Kshs. 13000 and Kshs. 20000
4. Is less than Kshs. 17000 **[8 marks]**
5. Two random sample were drawn from two normal populations and their values are

A: 364, 366, 374, 378, 382, 385, 387, 392, 393, 395, 397 **[6 marks]**

B: 366, 367, 375, 376, 382, 384, 388, 390, 392

1. Test whether the two population have the same variance at 5% level of significant?
2. Past experience shows that 1% of the lightbulbs produced in a plant are defective. Find the probability that more than one bulb is defective in a random sample of 30 bulbs, using
3. Binomial distribution
4. Poisson distribution **[6 marks**]

**QUESTION THREE (20 Marks)**

1. The following table gives the sample data from a survey on income of managing directors of the sampled companies both in Kenya and Tanzania

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Country | Income (in Euros) | | | | | | | | | |
| Kenya | 5000 | 4680 | 4500 | 3200 | 6845 | 6500 | 6065 | 5147 | 4365 | 3933 |
| Tanzania | 3540 | 6500 | 2700 | 3200 | 2760 | 6245 | 5544 | 5498 | 4367 |  |

1. Test whether the mean income for each country is above 4000 Euros at 5% level of significance **[8 marks]**
2. Test whether the variation for the two country was the same or not at 5% level of significance **[7 marks]**
3. Construct the 95% confidence level for the mean income of Kenya **[5 marks]**

**QUESTION FOUR (20 Marks)**

1. In a study of the television viewing habits of children, a development psychologist selects a random sample of 300 first graders- 100 boys and 200 girls. Each child is asked which of the following TV programs they like best Citizen, KTN and NTV. Results are shown in the contingency table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Viewing Preferences | | | | |
|  | KTN | CITIZEN | NTV | Row Total |
| Boys | 50 | 30 | 20 | 100 |
| Girls | 50 | 80 | 70 | 200 |
| Columns | 100 | 110 | 90 | 300 |

Do boys preference for the TV programs differ significantly from the girls preferences? Use 0.05 level of significance. **[12 Marks]**

1. The amount of time required at a customer care desk has been found to be approximately normally distributed with mean of 3 minutes and a variance of 2500 square seconds. What is the Probability that a randomly selected customer will:
2. Spend more than 7 minutes
3. Spend between 1 minute and 3 minutes
4. Take more than 150 seconds at the desk **[8 Marks]**

**QUESTION FIVE (20 Marks)**

1. An owner of a big firm agrees to purchase the product of a factory if the produced items do not have variance of 0.5mm2 in their length. To be sure of the specification the buyer selects a sample of 18 items from his lot. The length of each item was measured as follows:

18.57, 18.10, 18.61, 18.32, 18.33, 18.46, 18.12, 18.34, 18.57, 18.22, 18.63, 18.43, 18.37, 18.64, 18.58, 18.34, 18.43, 18.63. On the basis of this sample should the buyer purchase the lot at 5% level of significance? **[8 marks]**

1. A departmental store gives in service training to salesmen followed by a test. It is experienced that the performance regarding sales of any salesman is linearly related to the scores secured by him. The following data give test scores and sales made by nine salesmen during a fixed period.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Test score (x) | 16 | 22 | 28 | 24 | 29 | 25 | 16 | 23 | 24 |
| Sales (y) | 35 | 42 | 57 | 40 | 54 | 51 | 34 | 47 | 45 |

1. Fit a linear regression model to model the above data by determining a and b in the equation
2. Predict sales due to a salesman having the score X= 26 **[6 marks]**
3. Under what conditions can we construct confidence intervals for the unknown population mean from a random sample drawn from a population using
4. The normal distribution
5. The t distribution
6. Chebyshev Theorem **[6 marks]**