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**University Examinations 2015/2016**

FIRST YEAR, FIRST SEMESTER EXAMINATION FOR MASTER OF BUSINESS ADMINISTRATION

**HCBA 3102: STATISTICS FOR BUSINESS**

**DATE: AUGUST, 2016 TIME:** $3 $**HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE – (30 MARKS)**

1. Distinguish the following terms as used in statistics.
2. Statistics and parameter (2 Marks)
3. Point and interval estimates (2 Marks)
4. Descriptive and inferential statistics. (2 Marks)
5. According to the quarterly household survey, the mean weekly family income is estimated as Ksh. 12,500 with a standard deviation of Ksh. 1200. Assuming incomes are normally distributed, calculate in percentage households whose weekly income is;
6. Below Ksh 9,000
7. More than Ksh. 14,000
8. Between Kshs 7,500 and Ksh. 15,000 (6 Marks)
9. Suppose 20% of the household surveyed were classified as poor. Determine the minimum weekly income a household should earn to be out of this class.(3 Marks)
10. Two companies supplying a similar service are compared for their reaction times (in days) to complaints. Random samples of recent complaints to these companies gave the following statistics;

Sample Size Sample mean Standard Deviation

Company A 12 8.5 3.6

Company B 10 4.8 2.1

1. Determine the combined mean. (2 Marks)
2. Show which of the firm has a greater variability in reaction time. (5 Marks)
3. Calculate a 95% confidence interval for the time difference in reaction time. (6 Marks)
4. Highlight two ways statistical data can be significant in field of business. (2 Marks)

**QUESTION TWO (20 MARKS)**

1. The following data relates to daily expenditure (in Ksh).On the use of mobile phone by 10 male and 12 female insurance agents selected randomly in a firm.

Male 200 150 90 150 250 140 85 90 130 140

Female 220 200 180 150 230 165 90 85 160 180 120 160 At $∝ =0.05 , $that the hypothesis that female agents spend more than male agents

(9 Marks)

1. A director of a publishing house is interested in finding out the number of proposed text book manuscripts which remains unfinished due to author despair. Other publishers in the industry have informed her that the proportion of proposed text book manuscripts that do not get published due to author despair and apathy is 0.4.If she selects 10 manuscripts, determine the probability that;
2. Exactly four will remain unpublished due to author despair. (2 Marks)
3. At least two will remain unpublished due to author despair. (3 Marks)
4. Determine the mean and variance of this distribution. (4 Marks)
5. State two properties of a binomial distribution. (2 Marks)

**QUESTION THREE (20 MARKS)**

1. Given that V($x\_{1})= δ^{2}$, show that V$\left(\overbar{x}\right)= \frac{δ^{2}}{n}$ and hence the standard error is given by;

$\frac{δ}{\sqrt{n}}$ (6 Marks)

1. The number of accidents per week in a certain factory follows a poisson distribution with variance 1.6. Find the probability that ;
2. No accidents occur in a particular week. (2 Marks)
3. More than three accidents occur in a particular week. (4 Marks)
4. The data below shows the results of the survey of employees preferences for the two car leasing schemes in 3 different locations;

Number of Staff in;

 Location A Location B Location C

Scheme I 76 66 61

Scheme II 42 35 49

At $∝ =0.05$, test the hypothesis that employees preferences for the two car leasing schemes are independent of their work location. (8 Marks)

**QUESTION FOUR (20 MARKS)**

1. Explain what you would consider in determining the method to use in testing hypothesis. Give examples in each case. (6 Marks)
2. (i) Distinguish between one way and two way analysis of variance. (2 Marks)

(ii) Ms Alice, the director of secretary bird Bureau observed five typists in her secretarial typing pool and kept a record of how many minutes each one lost due to lateness. The following is an extract of her records;

Emily Janet Christine Florence Caroline

13 13 56 6 16

21 16 38 11 15

14 33 13 4 12

8 5 9 12 13

Test the null hypothesis that all the typists had an equal incidence of lateness at $∝ =0.05$.

( 12 Marks)

**QUESTION FIVE (20 MARKS)**

1. A company produces two types of tyres and wishes to test whether random sample of tyre type A had a mean life of 36 months with a standard deviation of 2.6 months. A random sample of 210 tyres of type B had a mean life of 29 months with a standard deviation of 3.2 months. At$ ∝ =0.05$,test whether the mean life times of the two type of tyres is significantly different. (6 Marks)
2. Highlight three properties of a good estimator. (6 Marks)
3. The number of apartments sold by Nairobi Homes Ltd per year ($Y\_{i}$) depends upon the family income ($x\_{1}$) and other firms selling the apartments ($x\_{2}$). A marketing research study has provided the following regression model and relevant information.

$$y\_{i}=4.85+0.69x\_{i}- 0.52x\_{2}$$

 (2.3) (0.3) (0.24)

n = 25, $r^{2}=0.76$

1. Comment on goodness of fit of the model. (2 Marks)
2. Test the significance of the three regression coefficients ($B\_{s}$) and comment on your results. (6 Marks)