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**JOMO KENYATTA UNIVERSITY**

**OF**

**AGRICULTURE AND TECHNOLOGY**

 **UNIVERSITY EXAMINATIONS 2016/2017**

**YEAR I SEMESTER I EXAMINATION FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN BUSINESS ADMINIMISTRATION**

**DBA 4102: STATISTICS**

**DATE: APRIL 2017 TIME: 3 HOURS**

**INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS**

**QUESTION ONE**

1. A company has developed a new hair shampoo. The company’s marketing executive has obtained figures for the cost of the plant expansion and new advertising. Taking these costs into account the executive thinks it would be a mistake to market the shampoo unless there is evidence that more than 20% of shampoo buyers would choose it rather than a competitive shampoo. The executive wants the chance of marketing it to be 1% if it does not have more than 20% of the market. The plan is to stock a random sample of store with the shampoo and have a random sample of 500 customers observed as they select a shampoo purchase. Perform a hypothesis test if 110 of the customers in the sample purchased the shampoo. [10 marks]
2. The credit manager of plaza stores obtained dates for a random sample of credit customers and recorded the data as below. Perform at 5% a test of the hypothesis that time to pay is independent of residence region.

 Customer residence Region

 Urban Suburnan Natural

Under 15 31 61 21

15 – 30 72 87 41

Over 30 37 32 11

**QUESTION TWO**

The folloiwng sums were obtained for sample of 50 points (x being the number of items listed on an order and y is the cost of processing the order). εx = 80, εy = 95

εxy = 400, εx2 = 438, εy2 = 475

1. Fit a regression model between X and Y [4 marks]
2. Obtain the standard error of the slope estimate. [8 marks]
3. Test the statistical significance of the intercept at 5% level of significance. [8 marks]

**QUESTION THREE**

1. 35% of customers who enter a store will make a purchase. Suppose that 8 customers inter the store and make independent purchase decisions. Calculate the probability that;
2. Exactly five customers make a purchase. [3 marks]
3. At least three customers make a purchase. [4 marks]
4. At most seven customers make a purchase. [3 marks]
5. Aptitude test scores of a job applicants are normally distributed with a mean of 140 and a standard deviation of 20;
6. What is the probability that a score will between 90 and 95. [3 marks]
7. If 1000 applicants take the test, how many would you expect to score 145 or below? [3 marks]
8. If 60% of those taking the exam has to fail, what is the pass mark? [4 marks]

**QUESTION FOUR**

1. Random samples of workers from four sections were given a job aptitude examination. Scores for the workers are given below. At 0.01 level of signicance determine whether mean scores for sections are equal. [12 marks]

Section I Section 2 Section 3 Section 4

61 46 75 59

68 53 64 73

59 59 68 70

56 56 78 83

65 61 75 75

1. The following is a record of marks obtained in an 1Q test before and after training of 9 students. Test the significance of the training using appropriate test.

I.Q score before 15 21 17 19 9 11 27 29 31

I.Q score after 18 23 15 14 15 21 16 22 25

 [8 marks]

**QUESTION FIVE**

1. The table below shows average daily temperature (X) and sales (Y) of beating oil by Firmino heating company;

X 2 7 12 14 19 22 25 30 35 44

Y 44 35 33 26 26 19 17 10 8 4

1. Draw a scatter diagram and interpret your finding. [3 marks]
2. Compute the Pearson correlation coefficient between X and Y [5 marks]
3. Test the Statistical significance of the correlation coefficient computed in (ii) above. [6 marks]
4. Average time taken by a particular plant to assemble a product are given below as; 3.6, 4.2, 4, 3.5, 3.8 and 3.1

Suppose the population assembly times have a normal distribution with a standard deviation of 0.3 hour. Construct 99% confidence interval for the population mean assembly time. [5 marks]