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**UNIVERSITY EXAMINATIONS**

**2020/2021 ACADEMIC YEAR**

**THIRD YEAR SECOND SEMESTER  
MAIN EXAMINATION**

**FOR THE DEGREE OF BACHELOR OF COMMERCE**

**COURSE CODE: BCO 318**

**COURSE TITLE: MANAGERIAL STATISTICS**

**DATE: 20-5-2021**

**TIME: 8.00AM-10.00AM**

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**INSTRUCTIONS TO CANDIDATES**

Answer Question One in Section A and Any other TWO (2) Questions in Section B

TIME: 2 Hours

KIBU observes ZERO tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over. 

**SECTION A**

**QUESTION ONE (COMPULSORY)**

- a) Explain the common features of a normal curve (5 marks)
- b) Determine the proportion of the normal curve that lies between a Z-score of -2.73 and Z-score of 1.78 (2 marks)
- c) A factory that makes handkerchiefs has 1000 workers. The factory manager observes that the mean number of handkerchiefs made in a week is 50 with a standard deviation of 10. If the weaving assumes a normal distribution, determine the number of workers who made:
- i) Between 45 and 65 items (4 marks)
- ii) More than 28 items (3 marks)
- iii) Between 62 and 78 items (4 marks)
- d) In a survey of 225 boys of which 85 were intelligent, 45 have educated fathers, 95 of the unintelligent boys have uneducated fathers. At the 5% level of significance do these figures support the hypotheses that educated fathers have intelligent boys? (9 marks)
- e) A typist claims that she can type at the rate of 120 words per minute. Can we reject her claim on the basis of 100 trials in which she demonstrates a mean of 116 words with statistical deviation of 15 words? Use 5% level of significance. (3 marks)

**SECTION B**

**QUESTION TWO**

a) Past experience indicates that an average number of 6 customers per hour refuel at a petrol station in Bungoma. Determine the probability of

- i) No customers refueling in an hour. 4.5 marks
- ii) 2 customers or less fueling in any one hour 4.5 marks
- iii) Compute the expected mean and standard deviation of this distribution 1.0 marks

b) In the past 0.02 per cent of the TVs sold in an electronic shop were small screen, 0.35 percent were medium, and 0.45 percent were large. In order to determine the stock to maintain of each type of TV set, the manager takes a random sample of 100 TVs that were recently purchased and finds that 40 were small screen, 25 were medium and 35 were large. Test at 5 % level of significance the hypothesis that the past pattern of sales  $H_0$  still prevails. 10 marks.

**QUESTION THREE**

- a) Explain characteristics of a binomial distribution. (6 marks)
- b) The management of the PQ Bank wants to test the effectiveness of an advertising company that is intending to enhance the awareness of the bank's service features. It administered a questionnaire before the advertising campaign designed to measure the awareness of services offered. After the advertising campaign, the bank administered the same questionnaire to the same group of people. Both the before and after advertising campaign scores are given in the following table

Consumer awareness of bank services offered:

Consumer	1	2	3	4	5	6	7	8	9	10
Before advertising campaign	81	81	87	74	60	80	77	66	75	77
After advertising campaign	85	86	84	81	76	78	79	81	81	83

Use Wilcoxon matched-pairs test, to test at 5% level of significance the hypothesis that there is no difference in awareness of services offered after the advertising campaign. 9 marks

#### QUESTION FOUR

- i) In Kenya energy standards are regulated by the Energy Regulatory Commission(ERC). Suppose that the ERC wishes to use  $p = 3$  independent samples of fuel mileages to compare the locations of the populations of all fuel mileages that could be obtained by using petrol brands: Ordinary, Super and Premium. The petrol brands data is given below:

Ordinary	super	premium
34.0	35.3	33.3
35.0	36.5	34.0
34.3	36.4	34.7
35.5	37.0	33.0
35.8	37.6	34.9

Use Kruskal-Wallis  $H$  Test to test at 5% level of significance the hypothesis that the petrol brands population differ in location. 4 marks

- ii) Explain four reasons why it is advisable to use random sampling rather than a census in studying a population. 4 marks
- iii) A quality inspector picks a sample of 10 tubes at random from a very large shipment of tubes known to contain 10 % defective tubes.
- a) What is the probability that no more than 2 of the tubes picked are defective?  
4 marks
- b) Differentiate between continuous and discrete probability distributions 3 marks