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UNIVERSITY EXAMINATIONS 2023/2024

FIRST YEAR FIRST SEMESTER EXAMINATION FOR DEGREE OF MASTERS OF SCIENCE IN FINANCE, MASTERS OF BUSINESS ADMINSTRATION, MASTERS OF SCIENCE IN ENTREPRENEURSHIP, MASTERS OF SCINCE IN SUPPLY CHAIN MANAGEMENT

SMB 5100: STATISTICS FOR BUSINESS / STATISTICS FOR SUPPLY CHAIN MANAGEMENT

DATE: APRIL 2023 **TIME: 2 HOURS**

INSTRUCTIONS: Answer Question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

a) Explain the meaning of the following terms as used in statistics (4marks)

(i) Variable

(ii) Measurement

(iii) Probability distribution

(iv) Statistical hypothesis

b) According to the 2009 current population survey conducted by the US Census Bureau, 40% of the U. S population 25 years old and above have completed bachelor's degree or more. Given a random sample of 50 people 25 years old and above, what is the expected number of people and the standard deviation of the number of people who have completed a bachelor's degree. (5 marks)

c) State and distinguish the two broad areas of statistics. (4 marks)

d) The mean number of errors due to a particular bug occurring in a minute is 0.0001.

i. What is the probability that no error will occur in 20 minutes. (3 marks)

ii. How long would the program need to run to ensure that there will be a 99.95% chance that an error will show up to highlight this bug (3 marks)

e) It is expected that 13% of tablets from a continuous production line will be defective. Find the probability that in a sample of 16 tablets chosen at random at least three will be (4 marks)

f) Highlight two probability sampling techniques (4 marks)

g) i. Explain the significance of coefficient of determination R-squared in interpreting the panel Regression results (2 marks)

ii. Explain the reason why adjusted R squared more preferred than R-squared. (l mark)

QUESTION TWO(20MARKS)

a) i. Distinguish between One way and two way ANOVA (2 marks)

ii. A company appoints 4 salesmen A, B, C and D and observes their sales performance in three seasons. Summer, winter and monsoon. The figures are in Ksh, 000.

	A	B	C	D
Summer	15	16	17	14
Winter	19	16	17	15
Monsoon	13	14	15	13

At 5% level of significance, analyze the variance for the performance of the 4 salesmen and discuss your results as a consultant to this company. (12marks)

b) Explain how the coefficient of the model below can be tested and illustrate how data can be fitted in the model using SPSS. $y_i = \beta_1 X_1 + \beta_2 X_2 + \varepsilon_i$. (6 marks)

QUESTION THREE (20MARKS)

a) A market research analyst believes that items placed on shelves at or near eye level will sell more rapidly than those placed at the bottom of the shelves. An experiment

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was set up where 1 8 weeks are randomly selected and the product is placed at eye level during 9 of these weeks and on the bottom shelf during the remaining 9 weeks. The sales data in units sold per week are as follows;

Bottom shelf	33	35	32	38	44	36	40	35	34
Eye level shelf	41	4-0	45	42	48	39	50	49	46

Test the research claim at 10% level of significance (12marks)

b) A random sample of size 16 sacks of Avocado has a mean weight of 54kg and a standard deviation of 3kg. find the 95% confidence interval of the population mean (5marks)

c) Highlight three advantages of sampling over census (3marks)

QUESTION FOUR (20MARKS)

a) In a large manufacturing company an opinion survey was conducted regarding two types of bonus scheme. Total employees were divided into three categories; technical, Executive and non-skilled. The results obtained by the of opinion survey are presented in the form of contingency table as given below;

Employee category	**Bonus scheme**	
	Type 1	**Type ll**
Technical	19	5
Executive	30	6
Non-skilled	12	4

At 5% level of significance, test the opinion about bonus schemes is independent of types of employees (7marks)

b) A firm manufacturing milk coolant reported that on average its coolant will have a lifespan of 8 years with a standard deviation of 0.8 years. In a certain period they sold 3000 coolants and 600 of them were replaced for breaking clown before (he warrant period.

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(i) If a customer buys a coolant from the firm, determine the probability that its lifespan will be.

- Less than 6.5 years (2marks)
- Between 6 and 9 years (3marks)

(ii) Determine the firms warrant period for its milk coolants. (4marks)

(iii) Determine the 95% confidence interval for the mean lifetime of the firm milk coolants. (3 marks)

QUESTION FIVE (20MKS)

a) A manufacturer does not know the mean and standard deviation of ball bearing he is producing. However, a sieving system rejects all the bearings larger than 2.4cm and those under 1.8cm in diameter. Out of 1000 ball bearings, 8% are rejected as too small and 5.5% as too big. What is the mean and standard deviation of the ball bearing produced? (6 marks)

b) If the mean and variance of a binomial distribution are 12 and 4 respectively. Determine the number of trials (n) and the probability of success(p) (4 marks)

c) Central bank believes that if consumer confidence is too high, the economy risk overheating. Low confidence is a warning that recession may be on way. In either case, the bank may choose to intervene by altering interest rates. The ideal value for the bank-s chosen measure is 50. We may assume the measure is normally distributed with standard deviation 10. The bank takes a survey of 25 people which returned a sample mean of 54 for the index. What would you advice the bank to do? Use .05% (6 marks)

d) Distinguish between descriptive and inferential statistical methods as used in research. (4 marks)

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