BERJAYA UNIVERSITY COLLEGE

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FACULTY OF BUSINESS

FINAL EXAMINATION

Student ID (in Figures) :														

Student ID (in Words) : _____

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Course Code & Name : **STA2114 BUSINESS STATISTICS**
Semester& Year : September – December 2024
Lecturer/Examiner : Suhada Binti Ishak
Duration : 3 Hours

INSTRUCTIONS TO CANDIDATES

1. **This question paper consists of 2 parts:**
   PART A (30 marks) : THIRTY (30) multiple-choice questions. Shade your answer in the Multiple-Choice Answer Sheet provided. You are advised to use a 2B pencil.
   PART B (70 marks) : FOUR (4) problem solving questions. Answer ALL questions. Answers are to be written in the Answer Booklet provided.
2. **Candidates are not allowed to bring any unauthorized materials except writing equipment and scientific calculator into the Examination Hall. Electronic dictionaries are strictly prohibited.**
3. **This question paper must be submitted along with all used and/or unused rough papers and/or graph paper (if any). Candidates are NOT allowed to take any examination materials out of the examination hall.**
4. **Only ballpoint pens are allowed to be used in answering the questions, with the exception of multiple choice questions, where 2B pencils are to be used.**

WARNING: The University Examination Board (UEB) of BERJAYA University College regards cheating as a most serious offence and will not hesitate to mete out the appropriate punitive actions according to the severity of the offence committed, and in accordance with the clauses stipulated in the Students' Handbook, up to and including expulsion from BERJAYA University College.

Total Number of pages = 11 (Including the cover page)

PART B : **STRUCTURED TYPE QUESTIONS (70 MARKS)**

INSTRUCTION(S) : **FOUR (4)** structured type questions. Answer **ALL** questions. Answers are to be written in the Answer Booklet provided.

Question 1

The probability that a new advertising campaign will increase sales is assessed as being 0.80. The probability that the cost of developing the new advertisement campaign can be kept within the original budget allocation is 0.40. If the two events are independent, calculate the following probability assume that:

a. the cost is kept within budget and the campaign will increase sales.
(2.5 marks)

b. the cost is kept within budget or the campaign will increase sales.
(2.5 marks)

c. the cost is not kept within budget or the campaign will not increase sales.
(2.5 marks)

d. neither the cost is kept within budget nor the campaign will increase sales.
(2.5 marks)

[Total: 10 marks]

Question 2

The number of column inches of classified advertisements appearing on Mondays in a certain daily newspaper is normally distributed with population mean of 320 and population standard deviation of 20 inches. For a randomly chosen Monday, calculate the probability that:

a. less than 340 column inches of classified advertisement.
(3 marks)

b. between 280 and 360 column inches of classified advertisement.
(3 marks)

c. approximately 10% will be less than how many column inches of classified advertisements.
(4 marks)

[Total: 10 marks]

Question 3

a. One of the biggest issues facing e-retailers is the ability to turn browsers into buyers. This is measured by the conversion rate, the percentage of browsers who buy something in their visit to a site. The conversion rate for a company's website was 10.1%. The website at the company was redesigned in an attempt to increase its conversion rates. A sample of 200 browsers at the redesigned site was selected. Suppose that 24 browsers made a purchase. The company officials would like to know if there is evidence of an increase in conversion rate at the 5% level of significance.

i. State the null and alternative hypothesis for this study.

(2 marks)

ii. State the critical value should the company officials use to determine the rejection region?

(2 marks)

iii. Analyze whether the company can conclude that there is evidence of an increase in conversion rate at the 5% level of significance.

(6 marks)

b. A quality control engineer is interested in the mean length of sheet insulation being cut automatically by machine. The desired mean length of the insulation is 12 feet. It is known that the sample standard deviation in the cutting length is 0.15 feet. A sample of 70 cut sheets yields a mean length of 12.14 feet. This sample will be used to obtain a 99% confidence interval for the mean length cut by machine.

i. Determine the critical value to use in obtaining the confidence interval.

(2 marks)

ii. Compute a 99% confidence interval for the mean length of sheet insulation being cut automatically by machine.

(6 marks)

iii. By referring to answer in (ii), state weather the machine is working properly or not. Justify your reasons.

(2 marks)

[Total: 20 marks]

Question 4

A candy bar manufacturer is interested in trying to estimate how sales are influenced by the price of their product. To do this, the company randomly chooses 6 small cities and offers the candy bar at different prices. Using candy bar sales as the dependent variable, the company will conduct a simple linear regression on the data below:

City	Price ($)	Sales
A	1.30	100
B	1.60	90
C	1.80	90
D	2.00	40
E	2.40	38
F	2.90	32

Table 1: Sales and Price of Candy Bar for Six Small Cities

a. Construct a scatter plot for the above dataset. (3 marks)

b. Calculate the following values:

i. Mean value for X and Y.

ii. Standard deviation value for X and Y.

iii. Covariance, $COV(X,Y)$

iv. Coefficient of correlation, *r*.

(15 marks)

c. Calculate the equation of the least squares regression line of yield (*y*) on the fertilizer (*x*). (10 marks)

d. Estimates the yield of a plant treated, weekly, with 3.2 grams of fertilizer. (2 marks)

[Total: 30 marks]

END OF QUESTIONS