

FINAL EXAMINATION

Student ID (in Figures) :

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Student ID (in Words) : _____

Subject Code & Name : **STA2114 BUSINESS STATISTICS**

Trimester& Year : January – April 2023

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. Answer ALL questions.
Please write your answers clearly in a SEPARATE sheet.
PART B (70 marks) : FOUR (4) problem solving questions. Answer ALL questions.
Answers are to be written in the SEPARATE sheet.
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 of Hospitality.

Total Number of pages = 10 (Including the cover page)

PART B : PROBLEM SOLVING QUESTIONS (70 MARKS)

INSTRUCTION(S) : FOUR (4) problem solving questions. Answer ALL questions. Answers are to be written in the SEPARATE SHEET.

Question 1

Accuracy in taking orders at drive-through window is important for fast food restaurants. Periodically, The Star newspaper publishes “The Drive-Thru Performance Study: Order Accuracy” that measures the percentage of orders that are filled correctly. In January 2022, the percentage of orders filled correctly at Mc Donald’s was approximately 79.6%. Suppose that you go to the drive-through window at Mc Donald’s and place an order. 4 friends of yours independently place orders at the drive-through window at the same Mc Donald’s. Calculate are the probabilities that:

- a. All of the orders will be filled correctly (2 marks)
- b. None of the orders will be filled correctly (2 marks)
- c. At most 3 of the orders will be filled correctly (4 marks)
- d. What are the mean and standard deviation of the binomial distribution for the number of orders filled correctly? (2 marks)

[Total: 10 marks]

Question 2

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.

- a) State the null and alternative hypothesis for this study. (2 marks)
- b) State the critical value should the company officials use to determine the rejection region? (2 marks)
- c) Analyze whether the company can conclude that there is evidence of an increase in conversion rate at the 5% level of significance. (6 marks)

[Total: 10 marks]

Question 3

A computer used by a 24-hour banking service is supposed to randomly assign each transaction to one of 5 memory locations. A check at the end of a day's transactions gave the counts shown in the table to each of the 5 memory locations, along with the number of reported errors.

Memory Location:	1	2	3	4	5
Number of Transactions:	82	100	74	92	102
Number of Reported Errors	11	12	6	9	10

The bank manager wanted to test whether the proportion of errors in transactions assigned to each of the 5 memory locations differ.

- a) Find the critical value of the test statistic at 1% level of significance. (2 marks)
- b) Construct expected frequency table and calculate the value of the test statistic. Show all the working steps needed. (15 marks)
- c) Write the conclusion for this test. (3 marks)

[Total: 20 marks]

Question 4

The managers of a brokerage firm are interested in finding out if the number of new clients a broker brings into the firm affects the sales generated by the broker. They sample 12 brokers and determine the number of new clients they have enrolled in the last year and their sales amounts in thousands of dollars. These data are presented in the table below:

Broker	Clients	Sales
1	27	52
2	11	37
3	42	64
4	33	55
5	15	29
6	15	34
7	25	58
8	36	59
9	28	44
10	30	48
11	17	31
12	22	38

- a. Construct a scatter plot for the above dataset. (4 marks)
- b. Calculate the following values: (12 marks)
- 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 .
- c. Compute least squares estimate of the slope and the least squares estimate of the Y-intercept. (11 marks)
- d. Predict the amount of sales (in \$1,000s) for a person who brings 25 new clients into the firm. (3 marks)

[Total: 30 marks]

END OF EXAM QUESTIONS