

FACULTY OF BUSINESS

FINAL EXAMINATION

Student ID (in Figures) :

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Student ID (in Words) : _____

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

Semester& Year : January – April 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. 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 = 11 (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 Answer Booklet provided.

Question 1

In a game called Taxation and Evasion, a player rolls a pair of dice. If on any turn the sum is 7, 11, or 12, the player gets audited. Otherwise, she avoids taxes. Suppose a player takes 5 turns at rolling the dice. Calculate the probability that:

- a. She does not get audited. (2 marks)
- b. She gets audited twice. (2 marks)
- c. She gets audited more than 2 times (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

The amount of tea leaves in a can from a production line is normally distributed with $\mu = 110$ grams and $\sigma = 25$ grams. Find the probability that a randomly selected can will contain

- a. between 82 and 100 grams of tea leaves. (2.5 marks)
- b. contain at least 100 grams of tea leaves. (2.5 marks)
- c. contain less than 100 grams or more than 120 grams of tea leaves. (2.5 marks)
- d. Approximately 83% of the can will have at least how many grams of tea leaves? (2.5 marks)

[Total: 10 marks]

Question 3

- a. A pizza chain is considering opening a new store in an area that currently does not have any such stores. The chain will open the new store if there is evidence that more than 5,000 of the 20,000 households in the area have a favorable view of its brand. It conducts a telephone poll of 300 randomly selected households in the area and finds that 96 have a favorable view. At the 5% level of significance:
- State the test of hypothesis that is of interest to the pizza chain. (2 marks)
 - State the critical value should be used to determine the rejection region? (2 marks)
 - Analyze whether the pizza chain can conclude that there is evidence of an opening a new store at the 5% level of significance. (6 marks)
- b. To become an actuary, it is necessary to pass a series of 10 exams, including the most important one, an exam in probability and statistics. An insurance company wants to estimate the mean score on this exam for actuarial students who have enrolled in a special study program. They take a sample of 8 actuarial students in this program and determine that their scores are: 2, 5, 8, 8, 7, 6, 5, and 7. This sample will be used to calculate a 90% confidence interval for the mean score for actuarial students in the special study program.
- Determine the mean and the standard deviation of the sample. (4 marks)
 - Identify the critical value used in constructing a 90% confidence interval. (1 mark)
 - Compute a 90% confidence interval for the mean score of actuarial students in the special program. (5 marks)

[Total: 20 marks]

Question 4

A researcher at MARDI assumes that there is a linear relationship between the amount of fertilizer supplied to tomatoes plant and the subsequent yield of tomatoes obtained. Data from eight tomatoes plants in Peninsular Malaysia, were selected at random and treated, weekly, with a solution in which x grams of fertilizer was dissolved in a fixed quantity of water. The yield, y kilograms of tomatoes was recorded as follows.

Plant	A	B	C	D	E	F	G	H
x	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
y	3.9	4.4	5.8	6.6	7.0	7.1	7.3	7.7

- 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