



**KOLEJ YAYASAN PELAJARAN JOHOR
ONLINE FINAL EXAMINATION**

COURSE NAME : INTRODUCTION TO STATISTICS
COURSE CODE : DSM1063
EXAMINATION : NOVEMBER 2020
DURATION : 6 HOURS

INSTRUCTION TO CANDIDATES

1. This examination paper consists of **TWO (2)** parts: PART A (10 Marks)
PART B (30 Marks)
2. Please refer to the detailed instructions in this question paper.
3. Answer ALL questions in the answer sheet which is A4 size paper (or other paper with the consent of the relevant lecturer).
4. Students are allowed to refer to resources such as lecture notes, books, internet or any other relevant resources.
5. Write your details as follows in the upper left corner for each answer sheet:
 - i. Student Full Name
 - ii. Identification Card (I/C) No.
 - iii. Class Section
 - iv. Course Code
 - v. Course Name
 - vi. Lecturer Name
6. Each answer sheet must have a page number written at the bottom right corner.
7. Answers should be handwritten, neat and clear.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

*This examination paper consists of **8** printed pages including front page*

PART A

This part contains of **ONE (1)** question.

Answer ALL questions in Answer Booklet.

QUESTION 1

A researcher is interested to study the opinion of executives of a logistic company towards some new policies imposed on them. The company has 30 branches throughout Malaysia. A sample of five branches was selected at random. All executives who work at these five branches were then selected for the study.

- i. State the population and sample of the study.
(2 marks)
- ii. Identify the variable for this study and state its level of measurement.
(2 marks)
- iii. Name the sampling technique used in the study.
(1 mark)
- iv. Besides the sampling techniques used in (iii), briefly explain how to select five branches by using systematic sampling technique.
(3 marks)
- v. What is the most suitable data collection method used for this study? Give **ONE (1)** disadvantage of the suggested method.
(2 marks)

[10 MARKS]

PART B

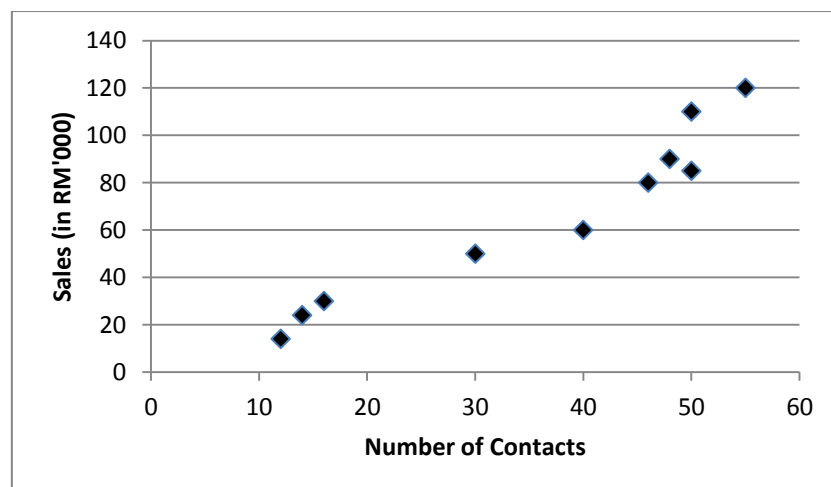
This part contains of **THREE (3)** questions.

Answer ALL questions in Answer Booklet.

QUESTION 1

A sales manager for an advertising agency believes there is a relationship between the number of contacts and the amount of the sales (in RM'000). To verify this belief, the following data were collected. The information for 10 recent number of contacts and the amount of sales is given below:

Number of Contacts	Sales (in RM'000)
14	24
12	14
30	50
16	30
46	80
40	60
48	90
50	85
55	120
50	110



- i. Based on the scatter diagram above, briefly describe the relationship between the number of contacts and sales.
(1 mark)
- ii. Calculate the Pearson's Product Moment Correlation coefficient and comment on the value obtained.
(3 marks)
- iii. Find the linear regression equation using the least square method.
(3 marks)
- iv. Explain the meaning of the slope coefficient obtained in (iii).
(1 mark)
- v. Estimate the amount of sales (in RM'000) if the number of contacts is 39.
(2 marks)

QUESTION 2

The Kampung Cookies produced and sells three types of traditional cookies. The number of cookies sold (in packs) and the price (in RM) for 2019 and 2020 are shown in the following table below.

Type of Cookies	2019		2020	
	Price (RM)	Quantity (in packs)	Price (RM)	Quantity (in packs)
Bahulu	35	300	35	270
Honeycomb	30	350	28	250
Crispy Sweet Rolls	20	400	24	360

Using the year 2019 as the base year, calculate:

- i. the simple aggregate price index in 2020 and explain the meaning.
(3 marks)

- ii. the Laspeyres' price index for the year 2020 and interpret the value obtained.
(4 marks)

- iii. the Paasche's quantity index for the year 2020.
(3 marks)

QUESTION 3

The following table shows the amount spent for the advertising cost in (in RM'000) of KMI Sdn. Bhd. for the year 2017 to 2019.

Year	Quarter			
	1	2	3	4
2017	-	110	90	120
2018	90	130	110	160
2019	110	150	130	180

- i. Find the trend values for the advertising cost using the moving average method.
- (4 marks)

- ii. The seasonal indices for the 1st to 3rd quarter are given below:

Quarter	1	2	3	4
Seasonal Index	82.22	109.65	88.61	X

Find the seasonal index of the 4th quarter marked as **X** and comment on the value obtained.

(2 marks)

- iii. By using the value of the seasonal index in (ii), forecast the advertising cost for the second quarter of 2020.

(4 marks)

[30 MARKS]

END OF QUESTION PAPER

APPENDIX 1

Correlation and Regression

1. Pearson's Product Moment Correlation Coefficient

$$r = \frac{\sum xy - \frac{\sum x \sum y}{n}}{\sqrt{\left[\sum x^2 - \frac{(\sum x)^2}{n} \right] \left[\sum y^2 - \frac{(\sum y)^2}{n} \right]}}$$

2. The least-square regression line, $y = a + bx$

$$i. \quad b = \frac{(\sum xy) - \left(\frac{(\sum x)(\sum y)}{n} \right)}{\left(\sum x^2 - \frac{(\sum x)^2}{n} \right)}$$

$$ii. \quad a = \frac{\sum y}{n} - b \left(\frac{\sum x}{n} \right)$$

Index Numbers

$$1. \text{ Laspeyres' price index} = \frac{\sum p_t q_0}{\sum p_0 q_0} \times 100$$

$$2. \text{ Paasche's price index} = \frac{\sum p_t q_t}{\sum p_0 q_t} \times 100$$

$$3. \text{ Simple Aggregate price index} = \frac{\sum p_t}{\sum p_0} \times 100$$

$$4. \text{ Weighted aggregate price index} = \frac{\sum w p_t}{\sum w p_0} \times 100$$

Where:

p_0 : price of the base year

p_t : price of the current year

q_0 : quantity of the base year

q_t : quantity of the current year

w : weights

Time Series Data Analysis

1. Trend Variation Value (TVV)

$$TVV = \frac{T_L - T_1}{n - 1}$$

2. Projected Trend Value (PTV)

$$PTV = T_L + TVV(t)$$

3. Forecasting

$$Forecast = PTV \times \frac{S.I}{100}$$

Where:

T_L : last trend

T_1 : first trend

$S.I$: seasonal index

n : number of trend

t : time