UNIVERSITI TEKNOLOGI MARA
ASSESSMENT 2

COURSE	**:**	**INTRODUCTION TO STATISTICS**
COURSE CODE	**:**	**QMT181/STA104**
DATE	**:**	**1ST JULY 2022**
TIME	**:**	**9.00 – 11.00 AM (120 MINUTES)**

Please read these instructions:

1) This assessment paper consists of **THREE (3)** questions.
2) Answer **ALL** questions.
3) The assessment must be taken completely **alone**. Showing it or discussion with anyone is forbidden.
4) Please write your answer on your own papers using **pen**.
5) Student must ensure that their test papers are **readable**. Ensure that your answers are **written clearly** with your name, group and student ID are provided.
6) Student must prepare their answer in **pdf format** and submit via **Google Classroom** or any other platform used by the lecturer. **(FULLNAME_GROUP.pdf)**
7) Keep close track of your allocated time. Due to internet connectivity, students are given no more than 20 minutes (11.00 - 11.20am) to submit their works electronically.
8) **Late submission (after 11.20 am) will not be accepted.**

ALL THE BEST

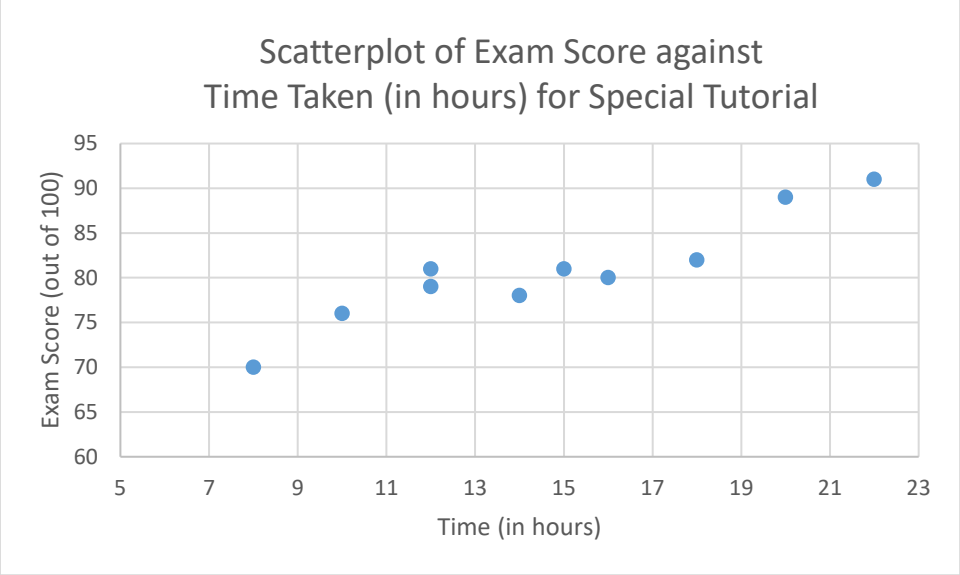
DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

This test paper consists of 5 pages

QUESTION 1

The following data shows the time taken for special tutorial in hours and exam score (out of 100) for a random sample of 10 students.

Time	10	15	12	20	8	16	14	18	12	22
Score	76	81	79	89	70	80	78	82	81	91



a) Based on scatter diagram above, briefly describe on the relationship between the two variables.

(2 marks)

b) Compute the Pearson Product Moment Correlation Coefficient on the given data. Explain the value obtained.

(5 marks)

c) Find the least squares regression equation line for the given data.

(4 marks)

d) State the intercept value. Interpret the meaning of the value obtained.

(2 marks)

e) What does the slope tell you about the time taken tutorial hours and exam score?

(2 marks)

f) Calculate the value of the coefficient of determination. Interpret the meaning.

(2 marks)

g) Predict a person exam score if he has attended special tutorial for 15 hours and 45 minutes.

(3 marks)

QUESTION 2

AMIN Sdn Bhd produces chili sauce which require four main raw materials. The information about the price (RM/Kg) and the quantity ('000 Kg) required are shown below for the year 2019 and 2020.

Material	Price (RM/Kg)		Quantity ('000 Kg)	
	2019	2020	2019	2020
Dry chili	12.00	12.70	40	50
Garlic	8.00	9.20	35	42
Corn starch floor	5.00	5.20	7	9
Sugar	4.50	4.70	12	15

Using 2019 as the base year,

a) Using an appropriate calculation, determine which material has the lowest increment in price for the 2020.

(5 marks)

b) Calculate the average of relative price index for the 2020.

(2 marks)

c) Calculate the Laspeyres quantity index for the year 2020.

(3 marks)

QUESTION 3

The following table shows the amount spent (RM) on stationaries by a company over the past three years (2017 – 2019).

Year	Quarter			
	1	2	3	4
2017	400	555	660	690
2018	414	570	670	710
2019	520	580	700	720

a) Using the moving average method, find the trend values for the above data.

(5 marks)

b) The seasonal indices for the above data are given as follows:

Quarter			
1	2	3	4
76.92	94.35	112.29	116.43

Explain the value of the seasonal index obtained for the second and third quarter.

(2 marks)

c) Forecast the amount spent on stationaries for the third quarter of the year 2020.
(3 marks)

END OF QUESTION PAPER

FORMULA LIST

Correlation and Regression

1. Pearson's Product Moment Correlation Coefficient

$$r = \frac{n\sum XY - \left(\sum X\right)\left(\sum Y\right)}{\sqrt{\left[n\sum X^2 - \left(\sum X\right)^2\right]\left[n\sum Y^2 - \left(\sum Y\right)^2\right]}} \quad \text{or} \quad \frac{\sum XY - \frac{\left(\sum X\right)\left(\sum Y\right)}{n}}{\sqrt{\left[\sum X^2 - \frac{\left(\sum X\right)^2}{n}\right]\left[\sum Y^2 - \frac{\left(\sum Y\right)^2}{n}\right]}}$$

2. The least-squares regression line of Y against X, $Y = a + Bx$

i.

$$b = \frac{n\sum XY - \left(\sum X\right)\left(\sum Y\right)}{n\sum X^2 - \left(\sum X\right)^2} \quad \text{or} \quad \frac{\sum XY - \frac{\left(\sum X\right)\left(\sum Y\right)}{n}}{\sum X^2 - \frac{\left(\sum X\right)^2}{n}}$$

ii.

$$a = \overline{Y} - b\overline{X} \quad \text{or} \quad \frac{\sum Y}{n} - b\frac{\sum X}{n}$$

Index Numbers

1. Laspeyres' price index $= \dfrac{\sum (p_t q_o)}{\sum (p_o q_o)} \times 100$
2. Paasche's price index $= \dfrac{\sum (p_t q_t)}{\sum (p_o q_t)} \times 100$
3. Simple aggregate price index $= \dfrac{\sum p_t}{\sum p_o} \times 100$
4. Weighted aggregate price index $= \dfrac{\sum p_t w}{\sum p_o w} \times 100$

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

