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)**

ANSWER SCHEME

(PLEASE CHECK THE SOLUTIONS BEFORE BEGIN MARKING)

QUESTION	SOLUTION	MARKS
1. (a)	√ √ √ √ There is a strong positive linear relationship between time taken for special tutorial with exam score received.	2 marks
(b)	$\sum x = 147,\ \sum y = 807,\ \sum x^2 = 2337,\ \sum y^2 = 65449,\ \sum xy = 12085$ $r = \frac{\sum xy - \frac{(\sum x)(\sum y)}{n}}{\sqrt{\left[\sum x^2 - \frac{(\sum x)^2}{n}\right]\left[\sum y^2 - \frac{(\sum y)^2}{n}\right]}}$ $= \frac{12085 - \frac{(147)(807)}{10}}{\sqrt{\left[2337 - \frac{(147)^2}{10}\right]\left[65449 - \frac{(807)^2}{10}\right]}}$ $= 0.9297$ **All summation values** √√√√√ **Substitute into formula** √√ **Final answer** √ √ √ There exists a very strong positive linear relationship between the two variables.	5 marks
(c)	a) $y = a + bx$ $b = \frac{\sum xy - \frac{(\sum x)(\sum y)}{n}}{\sum x^2 - \frac{(\sum x)^2}{n}}$ √ $= \frac{12085 - \frac{(147)(807)}{10}}{2337 - \frac{(147)^2}{10}}$ √ $= 1.26$ √ $a = \bar{y} - b\,\bar{x}$ √ √ $= 80.7 - 14.7(1.26)$ $= 62.18$ √ $y = 62.18 + 1.26x$ √√	4 marks

<table>
<tr><td>(d)</td><td>Intercept = 62.18.
√√
This indicate that if a student does not attend any special tutorial (i.e., x = 0), then he or she will obtain an exam score of 62.18.
√√</td><td>2 marks</td></tr>
<tr><td>(e)</td><td>Slope, b = 1.26.
√√
For each additional hours spent for special tutorial, the exam score will increase by 1.26 marks.
√√</td><td>2 marks</td></tr>
<tr><td>(f)</td><td>Coefficient of determination, $R^2 = 0.9297^2 = 0.864$ √√
√
86.4% of the total variation in exam score can be explained by the variation in time spent (in hours) for special tutorial.
√</td><td>2 marks</td></tr>
<tr><td>(g)</td><td>x = 15.75
√ √√ √√ √
y = 62.18 + 1.26 (15.75) = 82.025 ≈ 82.</td><td>3 marks</td></tr>
<tr><td>2.(a)</td><td><table><tr><th>Material</th><th>Simple Relative Price Index</th></tr><tr><td>Dry chili</td><td>105.8333 √√</td></tr><tr><td>Garlic</td><td>115 √√</td></tr><tr><td>Corn starch floor</td><td>104 √√</td></tr><tr><td>Sugar</td><td>104.4444 √√</td></tr></table>
Hence, corn starch floor has the lowest increment in price for the 2020. √√</td><td>5 marks</td></tr>
<tr><td>(b)</td><td>√√ √√
$I = \frac{105.8333 + 115 + 104 + 104.4444}{4} = 107.3194$</td><td>2 marks</td></tr>
<tr><td>(c)</td><td>$I = \frac{(50 \times 12) + (42 \times 8) + (9 \times 5) + (15 \times 4.5)}{(40 \times 12) + (35 \times 8) + (7 \times 5) + (12 \times 4.5)} \times 100$
√√ √√
$I = \frac{1048.5}{849} \times 100 = 123.50$
√√</td><td>3 marks</td></tr>
</table>

3.(a) — 5 marks

√ √√ √√√√√

Year	Quarter	Y	Average 4-Qtr MA	Trend
2017	1	400		
	2	555		
			576.25	
	3	660		578.000
			579.75	
	4	690		581.625
			583.50	
2018	1	414		584.750
			586.00	
	2	570		588.500
			591.00	
	3	670		604.250
			617.50	
	4	710		618.750
			620.00	
2019	1	520		623.750
			627.50	
	2	580		628.750
			630.00	
	3	700		
	4	720		

Position of trend values √

(b) — 2 marks

The amount spent on stationaries by the company dropped by 5.65% for the second quarter each year. √√

The amount spent on stationaries by the company increased by 12.29% for the third quarter each year. √√

(c) — 3 marks

$TVV = \frac{T_L - T_1}{n-1} = \frac{628.75 - 578}{7} = 7.25$ √√

$\hat{T}_{3rd\ quarter\ 2020} = T_L + TVV\ (t)$

$\hat{T}_{3rd\ quarter\ 2020} = 628.75 + 7.25\ (5) = 665$ √√

$\hat{y}_{3rd\ quarter\ 2020} = 665 \times 1.1229 = RM746.73$ √√