

CONFIDENTIAL

**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA**SCHOOL OF COMPUTING**  
Faculty of Engineering**UNIVERSITI TEKNOLOGI MALAYSIA****FINAL EXAMINATION****SEMESTER II 2021/2022****SUBJECT CODE : SCS1 2143/SECI 2143****SUBJECT NAME : PROBABILITY & STATISTICAL DATA ANALYSIS****YEAR/COURSE :****TIME :****DATE : 14<sup>TH</sup> JULY 2022**

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**INSTRUCTIONS TO THE STUDENTS:**

1. Please answer ALL the questions in the answer sheet form.
2. Fill in your particular in the answer sheet.
3. Do calculations in 3 decimal places.

<b>NAME</b>	
<b>MATRIC NO.</b>	
<b>SECTION</b>	
<b>LECTURER</b>	

(This question paper consist of 3 pages, including this pages)

## QUESTION 5

[15 MARKS]

- a) The Big Bike Association (BBA) is analyzing the relationship between engine volume and mileage, given the same volume of petrol. Table 4 is tabulated for liquid-cooled 4-stroke 16-valve cylinder engines from different big bike manufacturers. The engine volume is in total cubic km.

**Table 4:** Engine volume and mileage of different car manufacturer

Big Bike manufacturer	Engine volume, $x$ (cubic km)	Mileage, $y$ (km)
A	97	24
B	85	29
C	98	26
D	105	24
E	120	24
F	151	22
G	140	23
H	134	23
I	146	21

Based on the given data,

- Find the summation for  $x$ ,  $y$ ,  $x^2$ ,  $y^2$  and  $xy$  for the above data. (5 marks)
  - Find the linear regression equation using the least-square method. (4 marks)
  - Use the equation found in (5(a-ii)) to estimate the mileage for a motorbike which has 160 cubic km engine volume. (1 mark)
- b) Dr. Alia is monitoring 6 diabetic patients in her ward. After her morning round, she observed that her patient's blood pressure,  $p$  mmHg and their age ( $t$ ) is as follows:

**Table 5:** Blood pressure of Dr. Alia's patients

Patient	1	2	3	4	5	6
$t$	35	74	48	60	42	26
$p$	88	130	120	135	98	80

- Sketch a scatter diagram of the data and interpret the correlation coefficient. (2 marks)
- Given the estimator of the standard error of the slope ( $s_{b_1}$ ) is 0.07 and the linear regression equation for the data is  $\hat{y} = 50.728 + 1.216x$ , does the patient's age affect the blood pressure reading? Test the hypothesis using 95% confidence level. (3 marks)

**QUESTION 6****[20 MARKS]**

A consulting company would like to evaluate four different methods for training its employees to do a particular job. There are 24 employees that was randomly assign to one of the four methods of training. The employees were trained and tested, and the final results (average performance marks) were collected as shown in Table 6.

**Table 6:** Average performance marks

Method 1	Method 2	Method 3	Method 4
45	21	37	16
59	12	32	11
48	14	15	20
46	17	25	21
38	13	39	14
47	17	41	7

Perform the analysis of variance (ANOVA) at the 0.05 level of significance and indicate whether or not the training differs significantly for the four methods.

(20 marks)

**\*\* End of Questions \*\***