PAPER 1

CONFIDENTIAL

SCHOOL OF COMPUTING
Faculty of Engineering

UNIVERSITI TEKNOLOGI MALAYSIA

FINAL EXAMINATION

SEMESTER II 2021/2022

SUBJECT CODE : SCSI 2143/SECI 2143
SUBJECT NAME : PROBABILITY & STATISTICAL DATA ANALYSIS
YEAR/COURSE :
TIME :
DATE : 14TH JULY 2022

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.

NAME	
MATRIC NO.	
SECTION	
LECTURER	

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

QUESTION 1 **[10 MARKS]**

a) One of customer service department received the following number of calls during peak time over 10 time periods:

50, 47, 69, 55, 71, 77, 52, 63, 81, 64

It is known that the standard deviation of the number of calls during peak time is 15. Estimate the mean of number of calls over peak time with 99% confidence level.

(5 marks)

b) A researcher claims that some particular bacteria with an average life span of 12 hours will live to be about 20 hours when 25% of environment is more suitable for a longer lifespan. Is there any reason to believe that the mean is less than 21 if 31 bacteria that are placed on this suitable environment have an average life of 18 hours with a standard deviation of 4.8 hours? Use a 0.10 level of significance.

(5 marks)

QUESTION 2 **[20 MARKS]**

a) A researcher wants to prove that a brand X size AAA battery can last shorter than brand Y. Two normally distributed independent random samples of 10 each brand is selected, and the batteries are run continuously until they are no longer functional. The sample mean life for brand X is found to be $\bar{x} = 325$ minutes, and the sample standard deviation is $s_x = 4$ minutes. Whilst, the results for the brand Y batteries are $\bar{y} = 482$ minutes and $s_y = 6$ minutes. Is there sufficient evidence that the brand X batteries can last shorter than brand Y batteries of the same size? Use $\alpha = 0.05$ and assume the two population variances are equal.

(6 marks)

b) A random sample of 150 students of University A showed that 102 were in favour of a new grading system while another sample of 180 students of University B reveal that 108 were in favour of the new system. Do the results indicate a significant difference in the proportion of University A and University B students who favour the new grading systems? Use $\alpha = 0.01$

(6 marks)

c) In a study of the effectiveness of physical exercise in weight reduction, a group of 12 persons participate in a prescribed program of physical exercise for one month showed the following results (Table 1):

Table 1: Weight reduction of participants

Weight before (kg)	95	81	76	96	82	87	71	82	77	83	81	65
Weight after (kg)	89	77	77	94	80	86	72	82	74	81	78	63

Use the 0.01 level of significance to test whether the prescribed program of exercise is effective.

(8 marks)