UNIVERSITI TEKNOLOGI MARA
ASSESSMENT 1

COURSE	:	**STATISTICS FOR BUSINESS AND SOCIAL SCIENCES**
COURSE CODE	:	**STA404**
DATE OF EXAMINATION	:	**25 NOVEMBER 2020**
DURATION	:	**30 MINUTES**

INSTRUCTIONS TO CANDIDATES

1. This question paper consists of **FOUR (4)** questions.
2. Answer ALL parts of questions in the A4. Start each answer on a new page.
3. Candidates must accomplish this assessment within 30 minutes.
4. Candidates are required to convert their completed answer in one PDF file before submission (<FULLNAME_GROUP>.pdf) ex: ALI_KAM2283F.pdf
5. Candidates are given 15 minutes to submit the completed answer to the respective lecturer.
6. Please check to make sure that this assessment pack consists of :
   i) the Question Paper
   ii) a two–page Appendix 1
7. Answer ALL questions in English.

NAME:

STUDENT NO:

2	**0**	**1**							

GROUP:

Q1	**/5**	
Q2	**/5**	
Q3	**/5**	
Q4	**/5**	
TOTAL	**/20**	**%**

PLEASE SUBMIT THIS ASSESSMENT ON THE REQUIRED TIME

This assessment paper consists of 4 printed pages

QUESTION 1

A Dean in University X doing a study to determine the opinion of students regarding Online Distance Learning. From 1200 new students register in October 2020 session, only 450 students are selected randomly as a sample. Students are listed according to their student ID. The opinion of students is scale from 1 (strongly disagree) to 5 (strongly agree).
Using this situation, answer the following questions.

Answer **TRUE (T)** or **FALSE (F)** based on the above study.

a) The population is all new students register for October 2020 session in University X.

b) The sampling frame for this study is 450 students in University X.

c) The level of measurement for the interest variable in the study is ratio.

d) The type of variable for the above study is qualitative.

e) The most appropriate sampling technique for the above study is systematic random sampling.

(5 marks)

QUESTION 2

The number of defective parts observed in 15 different days in the quality inspection section of a plant.

Statistics

Defective		
N	Valid	15
	Missing	0
Median		20.00
Variance		38.600
Minimum		5
Maximum		24
Sum		252
Percentiles	25	12.00
	50	20.00
	75	22.00

a) Compute the mean and standard deviation.

(2 marks)

b) Construct a box and whisker plot for the above data.

(2 marks)

c) Based on the plot in b), comment on the shape of the distribution.

(1 mark)

QUESTION 3

A random sample of 35 customers at a convenience store was selected to see how much they spent on every visit. Some of the information is given below:

Table 1: **Summary Statistics**

	Mean	Std. Deviation
Amount spent (RM)	115.35	20.44

a) Construct a 99% confidence interval for the amount spent at a convenience store by customers.

(3 marks)

b) Based on the confidence interval obtained, can you conclude that customers spent more than RM110 at a convenience store? Explain your answer.

(2 marks)

QUESTION 4

One indicator of physical fitness is resting pulse rate. Ten men volunteered to test an exercise device advertised on television by using it three times a week for 30 minutes. Their resting pulse rate (beats per minute) were measured before the test began, and after five weeks. The results are shown in the table below:

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before	85.20	10	6.893	2.180
	After	82.30	10	5.314	1.680

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Before - After	**X**	2.378	.752	1.199	4.601	3.856	**Y**	.004

a) Find **X** and **Y**.

(2 marks)

b) State the 95% confidence interval of the difference in mean resting pulse rate before and after the test.

(1 mark)

c) Is there enough evidence to conclude that their resting pulse rate has reduced after five weeks? Give a reason to support your answer.

(2 marks)

END OF QUESTIONS

APPENDIX 1
SAMPLE MEASUREMENTS

Mean	$\bar{x} = \frac{\sum x}{n}$
Standard deviation	$s = \sqrt{\frac{1}{n-1}\left[\sum x^2 - \frac{\left(\sum x\right)^2}{n}\right]}$ or $s = \sqrt{\frac{1}{n-1}\left[\sum (x-\bar{x})^2\right]}$
Coefficient of Variation	$CV = \frac{s}{\bar{x}} \times 100\%$
Pearson's Measure of Skewness	Coefficient of Skewness = $\frac{3(\text{mean} - \text{median})}{\text{standard deviation}}$ OR $\frac{\text{mean} - \text{mode}}{\text{standard deviation}}$

CONFIDENCE INTERVAL

Parameter and description	A (1 - α) 100% confidence interval
Mean μ, for large samples, σ^2 unknown	$\bar{x} \pm z_{\alpha/2} \frac{s}{\sqrt{n}}$
Mean μ, for small samples, σ^2 unknown	$\bar{x} \pm t_{\alpha/2} \frac{s}{\sqrt{n}}$; df = n – 1
Difference in means of two normal distributions, μ_1 - μ_2 $\sigma_1^2 = \sigma_2^2$ and unknown	$(\bar{x}_1 - \bar{x}_2) \pm t_{\alpha/2} s_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}$; df = $n_1 + n_2 - 2$ $s_p = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$
Difference in means of two normal distributions, μ_1 - μ_2 , $\sigma_1^2 \neq \sigma_2^2$ and unknown	$(\bar{x}_1 - \bar{x}_2) \pm t_{\alpha/2} \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$; $df = \frac{\left[s_1^2 / n_1 + s_2^2 / n_2 \right]^2}{\frac{\left(s_1^2 / n_1 \right)^2}{n_1 - 1} + \frac{\left(s_2^2 / n_2 \right)^2}{n_2 - 1}}$
Mean difference of two normal distributions for paired samples, μ_d	$\bar{d} \pm t_{\alpha/2} \frac{s_d}{\sqrt{n}}$; df = n – 1 where n is no. of pairs