FINAL
ALTERNATIVE ASSESSMENT

(COVER PAGE)

Session	:	**April 2022**			
Programme	:	Diploma in Information Technology (DITN)			
Course	:	**STA1106: Quantitative Methods**			
Date of Examination	:	August 5, 2022 (Friday)			
Time	:	4.00pm – 6.30pm	Reading Time	:	Nil
Duration	:	2 Hours : 30 Minutes			

Note: 30 minutes is added into the duration of the examination to factor in any connectivity matters and for you to scan and upload your scripts.

Special Instructions :

Answer **ALL** questions.

Materials permitted :

Non-Programmable Calculator

Materials provided :

Nil

Examiner(s)	:	**Ms S.M. Elizabethrani Allappan** and Mr Bark Chee Beng
Chief Moderator	:	Ms Yogeswari Suppiah

*This paper consists of **6** printed pages, including the cover page*

DIPLOMA IN INFORMATION TECHNOLOGY PROGRAMME (DITN)
STA1106: QUANTITATIVE METHODS
FINAL ALTERNATIVE ASSESSMENT : APRIL 2022 SESSION

Instructions: This paper consists of **FOUR (4)** questions. Answer **ALL FOUR (4)** questions. All questions carry equal marks.

Question 1

(a) The table below gives the frequency distribution of the number of orders received each day for the past 100 days at the office of a mail-order company.

Number of orders	Number of days
10 – 12	4
13 – 15	12
16 – 18	20
19 – 21	30
22 – 24	17
25 – 27	11
28 – 30	6

(i) Construct a table with the related columns for the calculations in part (ii).

(3 marks)

(ii) Calculate the following:

(a) Mean.

(2 marks)

(b) Standard deviation.

(4 marks)

(iii) Produce a cumulative frequency polygon on a graph paper.

(3 marks)

(iv) From the cumulative frequency polygon, estimate

(a) the median.

(2 marks)

(b) the number of days with more than 23 orders.

(2 marks)

(v) Calculate the Pearson measure of skewness of the above data and comment on your answers.

(3 marks)

(b) An American Society of Investors survey found 30% of individual investors have used a discount broker. In a random sample of nine individuals, find the probability of

(i) less than three individual investors have used a discount broker.

(3 marks)

(ii) 3 to 5 individual investors have not used a discount broker.

(3 marks)

Question 2

(a) The probabilities that a patient will have 0, 1, 2, or 3 medical tests performed on entering a hospital are given below:

X	0	1	2	3
P(X = x)	$\frac{6}{15}$	$\frac{5}{15}$	$\frac{3}{15}$	$\frac{1}{15}$

(i) Find the probability that a patient will have to perform more than 1 medical test upon entering the hospital.

(2 marks)

(ii) Find the probability that a patient will have to perform 1 to 3 medical test upon entering the hospital.

(2 marks)

(iii) Find the expected number of medical test and the variance of medical test having a medical test upon entering the hospital.

(4 marks)

(b) Two thousand randomly selected adults were asked whether or not they have ever shopped on the Internet. The following table gives a two-way classification of the responses.

Gender	**Responses**	
	Have Shopped	**Have not Shopped**
Male	500	700
Female	300	500

Find the probability, if an adult chosen at random

(i) is a male or has Shopped on the Internet.

(3 marks)

(ii) has not shopped on the Internet given that she is a female.

(3 marks)

(c) A book rack contains 100 books, of which 30 books are related to Science, 40 are Mathematical books and the rest are Language books. If two books are chosen at random from the box without replacement, find the probability both books are of the

(i) same subject. (3 marks)

(ii) different subject. (2 marks)

(d) For the most recent year available, the mean annual cost to attend a private university in the United States was USD 26,500. Assume the distribution of annual costs follows the normal probability distribution and the standard deviation is USD 4,500. Find the probability that a randomly selected private university has an annual cost of

(i) more than USD 29,000. (3 marks)

(ii) USD 24,500 to USD 26,000. (3 marks)

Question 3

(a) The following data give the prices (in RM'000) of 20 condominiums sold recently in Kuala Lumpur.

584	**697**	**665**	**609**	**745**
687	**569**	**538**	**695**	**890**
623	**578**	**610**	**579**	**607**
571	**657**	**795**	**859**	**990**

(i) Find the mean and standard deviation for the above data. (2 marks)

(ii) Construct a 95% confidence interval for the population mean of condominiums value in Kuala Lumpur.

(5 marks)

(iii) A property agent claims that on average, a condominium will be sold at less than RM 800,000 per unit in Kuala Lumpur. Use $\alpha = 0.05$ to test if the property agent's claim is true.

(6 marks)

(b) Two groups of Bachelors in Business Administration students are given a problem-solving test, and the results are compared. At $\alpha = 0.1$, find if there is a true difference in their means.

Finance Major	**Marketing Major**
$Mean = 83.6$	$Mean = 75.9$
$Standard\ Deviation\ = 4.3$	$Standard\ Deviation\ = 3.8$
$Sample\ Size\ = 50$	$Sample\ Size\ = 50$

(7 marks)

(c) The average daily fat intake of U.S. adults with children in the household is 91.4 grams, with a standard deviation of 93.25 grams. Find the probability that the average daily fat intake of a random sample of 75 U.S. adults with children in the household is between 91.4 grams to 95.3 grams. (5 marks)

Question 4

(a) Two thousand randomly selected adults were asked whether or not they have ever shopped on the Internet. The following table gives a two-way classification of the responses.

Gender	Responses	
	Have Shopped	**Have not Shopped**
Male	500	700
Female	300	500

Use 5% level of significance if there is any association between gender and the responses made by the selected adults.

(9 marks)

(b) Below are the prices of Potato, Garlic, and Onion for the year 2010 and 2019. Also included are the quantities purchased. Use 2010 as the base year.

Item	2010		2019	
	Price(RM)	**Quantity**	**Price(RM)**	**Quantity**
Potato	4.90	1kg	12.00	1.5 kg
Garlic	5.90	1.5 kg	10.00	1kg
Onion	8.50	1.5 kg	13.90	1kg

(i) Compute the Paasche's quantity index for 2019. (3 marks)

(ii) Compute the Laspeyre's price index for 2019. (3 marks)

(c) An auto manufacturing company wanted to investigate how the price of one of its car models depreciates with age. The research department at the company took a sample of seven cars of this model and collected the following information on the ages (in years) and prices (in hundreds of dollars) of these cars.

No	Age (in years)	Prices (in hundreds of dollars)
1	8	45
2	3	210
3	6	100
4	9	33
5	2	267
6	5	134
7	6	109

(i) Determine the least square regression equation that can be used to estimate the prices of the car on the age of the car. (5 marks)

(ii) Find the correlation of coefficient and comment on the strength of correlation that exists between the two variables. Comment on your answer. (3 marks)

(iii) Calculate the coefficient of determination of the data above and comment on your answer. (2 marks)

~THE END~