INTI
International College Subang
LAUREATE INTERNATIONAL UNIVERSITIES'

FINAL
Examination Paper

(COVER PAGE)

Session	:	**April 2013**
Programme	:	Diploma In Business (DIB) Diploma In Business Administration (DBADI) Diploma In Information And Communication Technology (DICTN)
Course	:	**STA1101: QUANTITATIVE METHODS** **STA2102: BUSINESS STATISTICS**
Date of Examination	:	July 31, 2013
Time	:	2:00pm – 4:00pm Reading Time: Nil
Duration	:	2 Hours
Special Instructions	:	

Answer any **FOUR (4)** structured-type questions.

Materials permitted : Non-programmable Calculator

Materials provided : Formula Booklet 2 and Graph paper

Examiner (s)	:	**Mr. Tan Seng Kuan,** Billy Siew Woo Bing, S.M. Elizabethrani, Bark Chee Beng.
Moderator	:	Dr. Ch'ng Pei Eng

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

INTI INTERNATIONAL COLLEGE SUBANG

DIPLOMA IN BUSINESS PROGRAMME (DIB)
DIPLOMA IN BUSINESS ADMINISTRATION PROGRAMME (DBADI)
DIPLOMA IN INFORMATION AND COMMUNICATION TECHNOLOGY (DICTN)
STA1101: QUANTITATIVE METHODS
STA2102: BUSINESS STATISTICS

FINAL EXAMINATION: APRIL 2013 SESSION

Instructions: This paper consists of **SIX (6)** questions. Answer any **FOUR (4)** questions in the answer booklet provided. All questions carry equal marks.

Question 1

(a) The following data are the distribution of annual income (in RM'000) of 30 families in a village:

24	22	15	18	21	32	20	25	12	20
29	24	13	22	17	31	21	12	24	18
27	21	22	27	24	18	17	24	31	23

(i) Construct a frequency distribution table with a class width of 5 and with the value of 10 as the lower boundary of first class. (4 marks)

(ii) Construct a frequency histogram for the above data. (5 marks)

Using the frequency distribution obtained in (i) above, compute

(iii) the sample mean and standard deviation, (5 marks)

(iv) the mode. (3 marks)

(b) A new procedure has been revised to reduce the time taken in responding to customers' email enquiries. In the past, the mean time taken to response to a customer's email enquiry is 3.3 days. For the first 50 customers on whom new procedure has been implemented, the mean time taken to response is 3.2 days with standard deviation of 0.3 day. Use this information to answer the following questions to test at 5% significance level if there is evidence that the new response time has been reduced.

(i) State the null and the alternative hypotheses. (2 marks)

(ii) Determine the critical value(s). (1 mark)

(iii) Compute the test statistic. (1 mark)

(iv) What is the decision regarding the null hypothesis? (2 marks)

(v) State the conclusion of the test. (2 marks)

Question 2

(a) The net weight of a jar of jam is normally distributed with a mean of 30 g and a standard deviation of 10 g. What is the probability that a sample of 60 jars selected at random will have a sample mean net weight

(i) below 29 g? (4 marks)

(ii) between 29.5 g and 30.3 g? (5 marks)

(b) A discrete random variable X has the following probability distribution:

x	0	1	2	3
P(X = x)	0.4	0.3	r	0.1

Find

(i) the value of r (1 mark)

(ii) P(X > 1) (2 marks)

(iii) E(X) (2 marks)

(iv) the standard deviation of X (3 marks)

(c) A study of the colour choice for buyers of compact cars claims that among 5 most frequent choices, the preference rates apply as 22% prefers light red, 22% prefers white, 20% prefers light blue, 18% prefers dark blue and 18% prefers red. When 250 compacts cars are randomly selected, the following results are found.

Colour	Light Red	White	Light Blue	Dark Blue	Red
Frequency	56	57	39	37	61

At the 0.05 level of significance, test the claim that the given percentages are correct.

(8 marks)

Question 3

(a) The following table shows the total time taken to complete a particular task by two groups of management staff (Higher and Lower) of a company:

Group	Less than 15 minutes(A)	More than 15 minutes(B)
Higher(H)	105	5
Lower(L)	75	15

If a person is chosen at random from the sample, find

(i) P(H and B), (2 marks)
(iii) P(L or A), (4 marks)
(iv) P(A | H), (4 marks)

Are H and B independent? Explain your answer. (2 marks)

(b) A company attempts to evaluate the potential for a new bonus plan by selecting a random sample of five salespersons to use the bonus plan for a trial period. The weekly sales volumes before and after implementation of the bonus plan are shown below.

Weekly Sales	Salesperson				
	1	2	3	4	5
Before	15	12	18	15	16
After	18	14	19	18	18

Test at 5% level of significance to see whether the bonus plan will result in an increase in the mean weekly sales.

(13 marks)

Question 4

(a) A human resource manager of a company knows from experience that 70% of the applicants for a job with the company will perform the job satisfactorily. Of these that perform satisfactorily, 85% passes the ability test. Of those that do not perform satisfactorily, 65% passes the ability test.

(i) Draw a tree diagram to describe the situation. (2 marks)

(ii) What is the probability that an applicant did not perform satisfactorily and fail the ability test? (2 marks)

(iii) What is the probability that an applicant will pass the ability test? (3 marks)

(b) The weight of a female student in ABC College is normally distributed with mean 50kg and standard deviation 4.2kg.

(i) What is the probability that the weight of a randomly selected female student is greater than 53kg? (3 marks)

(ii) What is the probability that the weight of a randomly selected female student is between 45kg and 56kg? (4 marks)

(i) If 10% of the female students weigh less than x kg. Find the value of x. (5 marks)

(c) An investigation was carried out to assess the effects of adding certain vitamins to the diet. A group of two-week old rats was given a vitamin supplement in their diet for a period of one month, after which time their weights were noted. A control group of rats of the same age was fed on an ordinary diet and their weights were also noted after one month. The results are summarised in the table:

Type of diet	Sample size	Sample mean (g)	Sample Standard Deviation (g)
A: With vitamin supplement	64	89.6	12.96
B: Without vitamin supplement	36	83.5	11.41

Test at 5% significance level whether the results provide evidence that rats given the vitamin supplement have a greater weight than those not given the vitamin supplement.

(6 marks)

Question 5

(a) A motorcycle shop sells, on average, 2.5 motorcycles per week. Assuming that the sales occur at random, find the probability that:

(i) exactly 3 motorcycles are sold in a week. (3 marks)

(ii) at least 2 motorcycles are sold in a given two-week period. (4 marks)

(b) The daily traveling costs (RM x) of all the office staffs in an ABC Company are summarized in the following table.

RM per day	Number of staffs
$1 \leq x < 2$	41
$2 \leq x < 3$	95
$3 \leq x < 4$	202
$4 \leq x < 5$	147
$5 \leq x < 6$	15

(i) Construct a cumulative distribution table and hence, draw an ogive on the graph paper provided. (3 marks)

(ii) From the graph, estimate the median and the interquartile range. (5 marks)

(iii) From the graph, estimate the percentage of office staff that spends more than RM3.50 a day on travelling costs. (2 marks)

(c) The following data shows the quantities and prices of 4 components purchased by ABC company in year 2008 and year 2012.

	Year 2008		Year 2012	
Component	Price (RM)	Quantity	Price (RM)	Quantity
1	5.00	20	8.50	18
2	10.00	15	13.50	12
3	8.00	10	10.00	9
4	12.50	8	15.50	7

Using year 2008 as base year, calculate

(i) the Laspeyres quantity index for 2012. (4 marks)

(ii) the Paasche price index for 2012. (4 marks)

Question 6

(a) In December 2010, the mean cost for an airline round trip to Kuala Lumpur with a discount fare was RM300 per passenger. A random sample of 10 round-trip discount fares during the month of January 2007 provided the following data.

310 302 308 296 300 310 278 293 309 289

What is the point sample mean round trip discount fare in January? What is the sample standard deviation? (5 marks)

(b) Of all students at Senior College, 8 out of 10 enter tertiary education. Find the probability that from a group of 8 Senior College students chosen at random:

(i) 5 will enter a tertiary institution (3 marks)

(ii) at most 6 will enter a tertiary institution (5 marks)

(c) The relationship between the consultation hours per week, x, and the examination marks, y, of 8 students for a Mathematic subject is given in the following table:

Consultation hours/week, x	2	4	5	6	8	10	11	12
Examination marks, y	48	54	58	56	71	79	88	86

(i) Plot a scatter diagram for this data. Comment on the relationship of the two variables. (4 marks)

(ii) Compute the coefficient of correlation and interpret this value. (4 marks)

(iii) Find the regression equation of the examination marks on consultation hours per week. (4 marks)

~ The End ~

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