



**INTI**

INTERNATIONAL COLLEGE PENANG (507232-U)  
LAUREATE INTERNATIONAL UNIVERSITIES

FINAL  
Examination Paper

(COVER PAGE)

Session : April 2013

Programme : DIPLOMA IN INFORMATION TECHNOLOGY PROGRAMME/  
FOUNDATION IN BUSINESS/INFORMATION TECHNOLOGY

Course : STA2104 QUANTITATIVE METHODS/  
STA1202 STATISTICS

Date of Examination : 31 July 2013

Time : 2p.m. – 4p.m. Reading Time : Nil

Duration : 2 hours

Special Instructions :

This paper consists of FIVE (5) questions. Answer any FOUR (4) questions in the answer booklet provided. All questions carry equal marks.

Materials permitted :  
Non-Programmable Calculator

Materials provided :  
Formula Booklet 2, Graph Paper

Examiner(s) : Bark Chee Beng

Moderator : Teng Mei Tuan

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

## INTI INTERNATIONAL COLLEGE PENANG

DIPLOMA IN INFORMATION TECHNOLOGY PROGRAMME  
FOUNDATION IN BUSINESS/INFORMATION TECHNOLOGY

STA2104 : QUANTITATIVE METHODS

STA1202 : STATISTICS

FINAL EXAMINATION: APRIL 2013 SESSION

Instructions: This paper consists of **FIVE (5)** questions. Answer any **FOUR (4)** questions in the answer booklet provided. All questions carry equal marks.

**Question 1**

- (a) The following table gives 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) Prepare a frequency distribution using 10 as the lower boundary of first class, and the width of each class equal to 5. Use tally marking in your frequency counting construction. (5 marks)
- (ii) Construct a frequency histogram for the above. (3 marks)
- Using frequency distribution obtained in (i) above,
- (iii) compute the sample mean and standard deviation, (6 marks)
- (iv) compute the mode, (4 marks)
- (v) estimate the percentage of families in the village earning annual income below RM18,000. (4 marks)
- (b) Indicate which of the following variables are quantitative and which are qualitative. Classify the quantitative variables as discrete or continuous.
- (i) Amount of cholesterol level in a person's body. (1 mark)
- (ii) The preferred brand of a soft drink. (1 mark)
- (iii) The number of accidents in a road over the past three months. (1 mark)

**Question 2**

- (a) A man has 2 coins in his pocket, one is a fair coin and the other has heads on both sides. A coin is drawn randomly from his pocket and tossed.
- (i) Draw a tree diagram for all the possible outcomes. (3 marks)
- (ii) What is a probability that a head is obtained? (2 marks)
- (b) A die is loaded in such a way that the number 6 will appear three times more frequently than the other numbers. If the die is tossed six times, find the probability that
- (i) the number 3 will appear twice, (4 marks)
- (ii) the number 6 will appear twice, (2 marks)
- (iii) the number 6 will appear at least twice. (5 marks)
- (c) A survey is carried to study if there is association between public servants and private sector workers toward the three parties' affiliation. The result of the survey is listed in the following table:

	Party A	Party B	Party C
Public Servants	28	14	18
Private Sector Workers	21	8	11

Test at 1% significance level whether there is any association between public servants and private sector workers toward the three parties' affiliation.

(9 marks)

**Question 3**

- (a) The mass of a certain type of fruit of a farm is normally distributed with mean 100 g and standard deviation of 6 g.
- (i) One of this type of fruit is randomly taken from the farm, find the probability that the mass of this fruit is below 98 g.  
(4 marks)
- (ii) If a sample of 80 fruits is taken, how many of this fruits expected to have mass below 98 g.  
(2 marks)
- (iii) A sample of 12 fruits randomly picked and put in a pack. Find the probability of the mean mass of these 12 fruits is between 99 g and 102 g.  
(5 marks)
- (iv) Find the value of  $k$  if 20% of the fruits have mass above  $k$  g.  
(4 marks)
- (b) On average, a motorcycle shop sells 2.5 motorcycles per week. Assuming that the sales occur at random,
- (i) find the probability that exactly 3 motorcycles are sold in a given week,  
(3 marks)
- (ii) Find the probability that at least than 2 motorcycles are sold in a given two-week period,  
(5 marks)
- (iii) Find the expected number of motorcycles sold in a year. (Assume 52 weeks in a year).  
(2 marks)

**Question 4**

- (a) The diameters of screws produced by a machine are known to be normally distributed. The diameters, in mm, of a random sample of 5 screws are 5.05, 5.07, 5.03, 5.10, 5.07.
- (i) Calculate the sample mean and standard deviation. (5 marks)
  - (ii) Calculate a 95% symmetrical confidence interval for the population mean,  $\mu$ . (4 marks)
  - (iii) Assuming the population standard deviation is known to be 0.03 mm, base on the past production records on the machine. Determine the minimum sample size if we wish to estimate the  $\mu$  to be within 0.01 mm with 99% confidence. (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 days. Test at 5% significance level if there is evidence that the new response time has been reduced. (7 marks)
- (c) In a survey concerning having an internet service subscription in a certain city, a sample of 900 households was randomly chosen. It was found that 78 households do not subscribe to the internet service.
- (i) Find the sample proportion of the households that subscribe to the internet service. (2 marks)
  - (ii) Calculate 98% confidence interval for the population proportion of households that subscribe to the internet service. (4 marks)

**Question 5**

- (a) The following table indicates the prices and total productions of 3 types of vegetables for year 2010 and 2012.

Type of vegetable	Year 2010		Year 2012	
	Price (RM per kg)	Quantity ('000 kg)	Price (RM per kg)	Quantity ('000 kg)
Carrot	1.30	300	1.80	550
Cucumber	0.80	120	1.20	230
Green Bean	2.10	400	3.00	700

- (i) Using 2010 as the base year, calculate the aggregate quantity index for 2012. Interpret your answer. (4 marks)
- (ii) Using 2010 as the base year, calculate the Laspeyres' price index for 2012. Interpret your answer. (4 marks)
- (b) 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 linear relationship. (4 marks)
- (ii) Find the equation of the examination marks on consultation hours per week. (7 marks)
- (iii) Estimate the examination marks if a student intends to attend consultation for a 15 hours a week. Comment on the reliability of the estimate. (2 marks)
- (iv) Find the Pearson's correlation coefficient for the above data. Comment on your result. (4 marks)

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