INTI
International College Penang
LAUREATE INTERNATIONAL UNIVERSITIES

FINAL
Examination Paper

(COVER PAGE)

Session	:	**AUGUST 2014**
Programme	:	Foundation in Business Information Technology (CFPI)
Course	:	**STA1202: STATISTICS**
Date of Examination	:	December 10, 2014 (Wednesday)
Time	:	11.00am – 1.00pm Reading Time : Nil
Duration	:	2 Hours
Special Instructions	:	

This paper consists of **SIX (6)** questions. Answer any **FIVE (5)** questions in the answer booklet provided. All questions carry equal marks.

Materials permitted :

Non-programmable scientific calculator

Materials provided :

Graph Paper & Formula Booklet 2

Examiner(s)	:	**Chan Ah Wah**
Moderator	:	**Dr. Ch'ng Pei Eng**

This paper consists of 7 printed pages, including the cover page.

INTI INTERNATIONAL COLLEGE PENANG

FOUNDATION IN BUSINESS INFORMATION TECHNOLOGY (CFPI)

STA1202 : STATISTICS

FINAL EXAM : AUGUST 2014 SESSION

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Question 1

(a) Given a set of 9 sample values :

158, 165, 154, 159, 147, 162, 164, 150, 154

Find the following :

(i) Mean

(ii) Median

(iii) Mode

(iv) Range

(v) Standard deviation

[6 marks]

(b) A medical research team studied the ages of patients who had strokes caused by stress. The ages of 31 patients who suffered stress strokes were :

25	34	39	41	46	53	59	61	47	63	52
35	52	29	55	60	63	25	47	55	32	41
59	39	54	25	62	25	34	40	36		

Construct a frequency table for these ages. Use classes of equal widths, beginning with the class 25 – 29 .

[4 marks]

(c) An automobile club conducted a study of the number of cars per household. A sample of 605 households was taken, with data shown in Table 1 .

Table 1

Number of cars (x)	Frequency (f)
1	50
2	130
3	180
4	137
5	108

(i) State the values of n, $\sum x$ and $\sum x^2$ for the above distribution .

[5 marks]

(ii) Find, using the result in (i), the sample mean ($\bar{x}$) .

[2 marks]

(iii) Find the sample standard deviation (s). Show all your workings .

[3 marks]

Question 2

(a) Twenty-six workers were surveyed about how long it takes them to travel to work each day. The data below are given in minutes :

23 34 44 50 63 32 35 25 23 30 41 61 40
35 65 37 41 42 58 54 51 59 47 64 31 65

Construct a stem-and-leaf diagram for the above data .

[5 marks]

(b) Table 2 shows the frequency distribution of the masses of 52 women students at a college. Measurements have been recorded to the nearest kilogram .

(i) Construct a cumulative frequency table and draw a cumulative frequency curve .

[7 marks]

(ii) How many students weigh less than 57 kg?

[2 marks]

(iii) 20% were heavier that x kg. Find the value of x .

[2 marks]

(iv) Estimate the median .

[2 marks]

(v) Estimate the interquartile range .

[2 marks]

Table 2

Mass(kg)	Frequencies
40 – 44	3
45 – 49	2
50 – 54	7
55 – 59	18
60 – 64	18
65 – 69	3
70 – 74	1

Question 3

(a) Use Table 3 to answer the following questions :

Table 3

x	f
1 – 12	2
13 – 24	4
25 – 36	10
37 – 48	6
49 – 60	2

(i) What is the sample size n?

(ii) What is the class width?

(iii) What is the class mark of the last class?

(iv) What is the upper class limit of the last class?

(v) What is the upper class boundary of the last class?

[5 marks]

(b) The distribution of Bachelor degrees conferred by a local public university is listed in Table 4. What is the probability that a randomly selected degree is

(i) in Information Technology?

[1 mark]

(ii) in English or Mathematics?

[2 marks]

(iii) not in Engineering?

[2 marks]

Table 4

Major	Frequency
English	1074
Mathematics	1872
Chemistry	748
Physics	700
Information Technology	1794
Business	1446
Engineering	414
	8048

(c) Four defective light bulbs are in a bin of 89 bulbs. Find the probability of not finding a defective bulb if three bulbs are selected at random

(i) if the bulbs are replaced,

[2 marks]

(ii) if the bulbs are not replaced .

[2 marks]

(d) A small company has determined that based on the sales of home water heaters, there is a 60% chance of selling no water heaters on a given day; a 30% chance of selling one water heater (and making \$50); and a 10% chance of selling two water heaters (and making \$100). Let X = the profit made per day off water heaters, and we can represent that random variable by Table 5 .

Table 5

X	P(X)
\$0	0.60
\$50	0.30
\$100	0.10

(i) Find the mean of X .

[2 marks]

(ii) Find the variance of X .

[3 marks]

(iii) Find the standard deviation of X .

[1 mark]

Question 4

(a) In Table 6 is a sample of 600 randomly selected chairs made by a furniture company. Let

M = the event of a chair being made by the morning shift,

D = the event that the chair has one or more defects and must be repaired before shipment .

Table 6

	D	$\overline{D}$	Total
M		320	400
$\overline{M}$			
Total		480	600

(i) Complete the table entries .

[5 marks]

(ii) Find P(D) .

[1 mark]

(iii) Find P($\overline{M}$ and D) .

[1 mark]

(iv) Find P($\overline{M}$ or D) .

[2 marks]

(v) Find P(D|M) .

[2 marks]

(vi) Are D and M independent? Explain .

[2 marks]

(vii) Are D and M mutually exclusive? Explain .

[2 marks]

(b) Human blood is grouped into four types. The percentages of citizens of a Western country with each type are listed below :

O	A	B	AB
43%	40%	12%	5%

A person is randomly chosen from this country. Find the probability that this person

(i) has type **O** blood .

[1 mark]

(ii) has type **A** or **B** .

[2 marks]

(iii) does not have type **O** or **A** .

[2 marks]

Question 5

(a) The mean number of accidents per month at a certain intersection is three. What is the probability that in any given month four accidents will occur at this intersection?

[4 marks]

(b) A multiple choice test has 30 questions, and each has 5 possible answers, of which one is correct. If a student guesses on every question, find the possibility of him getting exactly 30% .

[4 marks]

(c) According to a college survey, 22% of all students work full time. Find the mean and the standard deviation of the number of students who work full time in samples of size 17 .

[5 marks]

(d) The discrete random variable W has probability distribution as shown in Table 7 :

Table 7

w	-3	-2	-1	0	1
$P(W = w)$	0.10	0.25	0.30	0.15	d

Find

(i) the value of d,

[3 marks]

(ii) $P(-3 \leq W < 0)$,

[2 marks]

(iii) the mode .

[2 marks]

Question 6

The marks of 500 candidates in an examination are normally distributed with a mean of 45 marks and a standard deviation of 20 marks .

(a) Given that the passing mark is 41, estimate the number of candidates who passed the examination .

[6 marks]

(b) If 5% of the candidates obtain a distinction by scoring x marks or more, estimate the value of x .

[6 marks]

(c) Estimate the interquartile range of the distribution .

[8 marks]

End of Paper

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