



**INTI**  
**International College Penang**  
 LAUREATE INTERNATIONAL UNIVERSITIES\*

**FINAL**  
 Examination Paper  
 (COVER PAGE)

Session : August 2017

Programme : Foundation in Business Information Technology (CFPI)

Course : STA1203: Business Statistics

Date of Examination : 7 December 2017 (Thursday)

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)**  
**STA1203 : BUSINESS STATISTICS**  
**FINAL EXAM : AUGUST 2017 SESSION**

**Instructions**

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

**Question 1**

- (a) Given a set of 9 sample values :

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

Find the following :

- |             |                         |
|-------------|-------------------------|
| (i) Mean    | (iv) First Quartile     |
| (ii) Median | (v) Third Quartile      |
| (iii) Mode  | (vi) 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 than  $x$  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)	Frequency
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	Frequency
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?
- (ii) in English or Mathematics?
- (iii) not in Engineering?

[1 mark]

[2 marks]

[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 a 10% chance of selling two water heaters. The profit of selling one water heater is RM 50. If  $X$  is the profit made per day of water heaters, and we can represent the random variable by Table 5.

Table 5

$X$	$P(X)$
RM 0	0.60
RM 50	0.30
RM 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	$\bar{D}$	Total
M		320	400
$\bar{M}$			
Total		480	600

- (i) Complete the table entries . [5 marks]
- (ii) Find  $P(D)$  . [1 mark]
- (iii) Find  $P(\bar{M} \text{ and } D)$  . [1 mark]
- (iv) Find  $P(\bar{M} \text{ or } D)$  . [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** 43%      **A** 40%      **B** 12%      **AB** 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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