



FINAL
Examination Paper

(COVER PAGE)

Session : August 2015

Programme : Foundation In Business Information Technology (CFPI)

Course : STA1202: Statistics

Date of Examination : 8th December 2015 (Tuesday)

Time : 8:00am – 10:00am

Duration : 2 Hours Reading Time : Nil

Special Instructions :

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

IMPORTANT NOTE : THIS PAPER SHOULD NOT BE TAKEN OUT OF THE EXAMINATION HALL

Materials Permitted : Non-programmable scientific calculator

Materials Provided : Graph Paper & Formula Booklet 2

Examiner(s) : Mr. 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 2015 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) A medical research team studied the ages of patients who had strokes caused by stress. The ages of 33 patients who suffered stress-related strokes were :

27 31 39 44 46 53 56 63 58 45 33
 36 39 36 57 44 29 44 56 32 35 29
 52 30 48 30 44 48 32 42 60 46 37

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

[5 marks]

- (b) An automobile club conducted a study of the number of cars per household. A sample of 736 households was taken, and the result was shown in-Table 1.

Table 1

Number of cars (x)	Frequency (f)
1	125
2	141
3	177
4	163
5	130

- (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 .

[2 marks]

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

[3 marks]

$$\text{Hint: } s^2 = \frac{\sum x^2 - \frac{(\sum x)^2}{n}}{n-1}$$

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

29 30 47 53 63 30 26 42 42 48 53 62 61
20 41 65 24 42 41 24 36 34 60 39 57

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

[5 marks]

Question 2

(a) Given a set of 9 sample values :

52 50 54 52 51 53 49 52 55

Find the following :

- | | |
|-------------|------------|
| (i) Mean | (iv) Range |
| (ii) Median | (v) Q_1 |
| (iii) Mode | (vi) Q_3 |

[6 marks]

(b) Use the frequency distribution in Table 2 to answer the following questions .

Table 2

Observations (x)	Frequency (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 midpoint 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?
- (vi) Which is the modal class?

[6 marks]

- (c) The distribution of Bachelor degrees conferred by a local public university is listed in Table 3 by major.

Table 3

Major	Frequency
English	1839
Mathematics	1299
Chemistry	782
Physics	627
Liberal Arts	1785
Business	2036
Engineering	526
	8894

What is the probability that a randomly selected degree is

- (i) in Chemistry? [2 marks]
- (ii) in Business or Engineering? [3 marks]
- (iii) not in Physics? [3 marks]

Question 3

- (a) 75% of local college students use the library at least once a week. If a group of 60 students from a college is selected at random, how many would you expect not to use the library? [3 marks]

- (b) Five defective light bulbs are in a bin of 87 bulbs. Find the probability of not finding a defective bulb if three bulbs are selected at random
- (i) if the bulbs are replaced, [3 marks]
- (ii) if the bulbs are not replaced. [4 marks]
- (c) The random variable X is the number of houses sold by housing developer in a single month in its Penang office. Its probability distribution is given in Table 4 .

Table 4

Houses sold (x)	Probability $p(x)$
0	0.10
1	0.20
2	0.18
3	0.10
4	0.15
5	0.05
6	0.09
7	0.13

- (i) Compute the mean of the random variable. [4 marks]
- (ii) Compute the standard deviation of the random variable. [6 marks]

Question 4

- (a) The discrete random variable X has the following probability distribution :

x	7	8	9	10	11
$P(X = x)$	0.2	a	0.3	0.1	b

- (i) If $E(X) = 9.05$, write down two equations involving a and b . [2 marks]
Then, find the values of
- (ii) a and b , [2 marks]
- (iii) $E(X^2)$, [2 marks]
- (iv) $\text{Var}(X)$, [3 marks]

- (v) $\text{Var}(-2X + 2)$, [2 marks]
- (vi) $P(8 < X \leq 10)$. [2 marks]
- (b) A multiple choice test has 30 questions, and each has five possible answers, of which one is correct. If a student guesses on every question, find the probability of getting exactly 20% . [7 marks]

Question 5

- (a) According to a college survey, 16% of all students work full time. Find the mean and standard deviation of the number of students who work full time in a sample size of 20 . [3 marks]
- (b) Apex Plastics, a company which makes plastic cases for CDs, has found that 18% of the cases have scratches on them. The cases are shipped in boxes of 30 .
- (i) Find the mean number of scratches in a box . [2 marks]
- (ii) Find the standard deviation for the number of scratched CD cases per box . [2 marks]
- (iii) Find the probability of exactly 3 scratched CDs per box . [3 marks]
- (c) Find the following for a standard normal distribution .
- (i) $P(0 < z < 2.35)$ [2 marks]
- (ii) $P(-1.18 < z < 2.09)$ [2 marks]
- (iii) $P(z < -1.55)$ [2 marks]
- (iv) $P(z > 2.00 \text{ or } z < -1.00)$ [2 marks]
- (v) Find the z-score or value corresponding to the 85th percentile . [2 marks]

Question 6

- (a) A man submits 5 sets of an application form for the shares of Company ABC. If the probability of each application being successful is $\frac{1}{8}$,
- (i) state the binomial distribution applicable to this problem . [3 marks]
And then, find the probability that
- (ii) none of his application is successful, [2 marks]
- (iii) at least one application was successful, [2 marks]
- (iv) not more than 2 applications were successful, giving your answers correct to 4 significant figures . [4 marks]

(b) It is known that 5% of the durians produced in an orchard in Balik Pulau do not bear good fruit.

(i) State the Poisson approximation applicable to this problem . [3 marks]

(ii) Calculate the probability that of the 50 durians selected randomly, less than 3 do not bear good fruit . [6 marks]

————— End of Paper —————

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