INTI INTERNATIONAL UNIVERSITY

FOUNDATION IN BUSINESS INFORMATION TECHNOLOGY (CFPI)/
FOUNDATION IN SCIENCE (CFSI)
STA1202: STATISTICS
FINAL EXAMINATION: JANUARY 2014 SESSION

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

Question 1

(a) (i) A box contains 4 white Mashimaro and 6 yellow Mashimaro. If two Mashimaro are picked at random one after another without replacement from the box, what is the probability of picking both white Mashimaro?

(2 marks)

(ii) There are 100 families in a village, 44 of them have star fruit trees, 34 have durian trees and 14 have both. A family is selected at random from the village. Find the probability that the family selected has star fruit trees or durian trees.

(2 marks)

(iii) Ten cards numbered from 1 to 10 are placed in a box. Two cards are picked at random from the box without replacement. Find the probability of picking a number that is prime number.

(2 marks)

(iv) Given that there are Bag A and Bag B. Bag A contains 5 white Mashimaro and 4 red Mashimaro. Bag B contains 3 white Mashimaro and 2 red Mashimaro. A Mashimaro is picked at random from Bag A or Bag B and the colour is noted. Find the probability that a white Mashimaro is chosen.

(2 marks)

(b) Given that $S = \{11,\ 12,\ 13,\ 14,\ 15,\ 16\}$, $A = \{12,\ 14,\ 16\}$, $B = \{11,\ 13,\ 15\}$.

(i) Find $P(A\ and\ B)$, what can you say about these two events?

(2 marks)

(ii) Find $P(A\ or\ B)$, what can you say about these two events?

(2 marks)

(c) The continuous random variable Z has a standard normal distribution $N(0,\ 1\ )$. Find the following probabilities:

(i) $P(Z < 1.5)$ and $P(Z > 1.5)$,

(2 marks)

(ii) $P(0.5 < Z < 1.6)$,

(2 marks)

(iii) $P(-0.8 < Z < 1.4)$,

(2 marks)

(iv) $P(-1.6 < Z < -0.4)$.

(2 marks)

Question 2

(a) Data of the total students for males and females in a university are asked whether they like or don't like online shopping are shown in the table below. One student from this university is chosen at random.

Gender	Like	Don't Like	Total
Male	135	a	491
Female	b	c	597
Total	567	521	1088

(i) In the table given, find the values of a, b and c.

(3 marks)

(ii) What is the probability that the male student don't like online shopping?

(2 marks)

(iii) Are 'Male' and 'Don't like online shopping' independent events? Justify your answer.

(3 marks)

(iv) Given that a female student is selected, what is the probability that the student like online shopping?

(2 marks)

(b) At Safari Zoo Malacca, rides are offered on horse, elephants and camels. Miss Soong-Baby has money for only one ride. To decide which ride to choose, she tosses a fair coin twice. If she gets 2 heads, she will go on the horse ride, if she gets 2 tails, she will go on the elephant ride and if she get 1 of each, she will go on the camel ride.

(i) Find the probabilities that she goes on each of the three rides.

(3 marks)

(ii) The probabilities that Miss Soong-Baby is frightened on each of the rides are as follows:

Horse ride $\frac{6}{10}$, , elephant ride $\frac{7}{10}$, and camel ride $\frac{8}{10}$

Draw a fully labeled tree diagram showing the rides that Miss Soong-Baby could take and whether or not she is frightened.

(2 marks)

(iii) Miss Soong-Baby goes on a ride. Find the probability that she is frightened.

(2 marks)

(iv) Given that Miss Soong-Baby is not frightened, find the probability that she went on the elephant ride.

(3 marks)

Question 3

(a) The data below shows the 70 students obtain the test 1's marks for STA 1202 Statistics in 1P1, 1C1 and 1C2 classes.

(i) Copy and complete the table below. (5 marks)

Class Interval	Frequency	Mid-point x	fx	fx^2
50 – 59	4			
60 – 69	10			
70 – 79	18			
80 – 89	22			
90 – 99	16			
	$\sum f$ =70		$\sum fx$ =	$\sum fx^2$ =

(ii) Find the mean of the data.

(2 marks)

(iii) Find the mode of the data using formula.

(3 marks)

(iv) Find the median of the data using formula.

(3 marks)

(v) Find the variance of the data using formula.

(3 marks)

(vi) Using a scale of 1 cm to 1 student on the vertical axis and 2 cm to 10 marks on the horizontal axis, draw a histogram of the distribution.

(4 marks)

Question 4

(a) $X \sim Bin(10,0.81)$, Find

(i) $E(X)$.

(2 marks)

(ii) $Var(X)$.

(2 marks)

(b) The random variable $X \sim N(82,\ 10^2)$. Find

(i) $P(X < 84)$, (2 marks)

(ii) $P(X > 97)$. (2 marks)

(c) X is a random variable with Poisson probability distribution. Find

(i) $P(X = 2)$ when $\lambda = 8$.

(2 marks)

(ii) $P(3 < X \leq 5)$ when $\lambda = 2$.

(2 marks)

(d) The discrete random variable X has the following probability distribution. The mean of X is 3.69.

X	1	2	3	4	5	6
$P(X = x)$	0.15	p	0.1	0.35	q	0.2

(i) Write down two equations involving p and q and hence find the values of p and q.

(4 marks)

(ii) Calculate $Var(X)$,

(2 marks)

(iii) Find $P(X > Var(X))$.

(2 marks)

Question 5

(a) The data below shows the grades of STA 1202, X, obtained by 41 students in 1P1 class.

A+	**B+**	**B**	**C**	**A-**	**B+**	**A-**	**B+**	**B+**	**A+**	**B+**	**A-**	**A+**	**A+**
A-	**A-**	**A+**	**B-**	**A+**	**B**	**C+**	**A+**	**A-**	**B**	**A+**	**B+**	**A-**	**B+**
A+	**B+**	**B+**	**A+**	**C+**	**A+**	**A+**	**A-**	**C+**	**C**	**A-**	**B**	**B+**	

(i) Copy and complete the table below. (2 marks)

Grade of MAT 1210, X	A+ 4.00	A- 3.67	B+ 3.33	B 3.00	B- 2.67	C+ 2.33	C 2.00
Frequency							
Probability of X , $P(X = x)$.							

(ii) Using a scale of 2 cm to 1 student on the horizontal axis and 2 cm to 1 grade on the vertical axis, draw a bar chat to represent the distribution.

(5 marks)

Given that grade of STA 1202, X is a discrete random variable with the probability distribution above.

(iii) Find $E(X)$.

(2 marks)

(iv) Find $Var(X)$.

(2 marks)

(v) Find $P(X > E(X))$.

(1 mark)

(b) The weights of *Yoga* book are normally distributed with mean 20g. It is found that the weights of 97.86% of booklet are within 23g of the mean.

(i) Find the standard deviation of the weights of the booklet.

(3 marks)

(ii) Find the probability that a randomly chosen booklet weighs more than 25g.

(2 marks)

(iii) Find the probability that a randomly chosen booklet weighs between 2g and 38g.

(3 marks)

Question 6

(a) Miss Soong-Baby measured the diameters of the rose flowers in centimeters. Her results are recorded as follows $2,\ 3,\ 5,\ 8,\ 11,\ 5,\ 5,\ 9,\ 6,\ 5$. Find

(i) the mean of the data.

(2 marks)

(ii) the mode of the data.

(2 marks)

(iii) the median of the data.

(2 marks)

(iv) the standard deviation of the data.

(2 marks)

(b) A fair die has one face numbered 1, one face numbered 3, two faces numbered 5 and two faces numbered 6.

(i) Find the probability of obtaining at least 7 odd numbers in 8 throws of the die.

(4 marks)

(ii) The die is thrown twice. Let X be the sum of the two scores. The following table shows the possible values of X.

First throw	Second Throw 1	3	5	5	6	6
1	2	4	6	6	7	7
3	4	6	8	8	9	9
5	6	8	10	10	11	11
5	6	8	10	10	11	11
6	7	9	11	11	12	12
6	7	9	11	11	12	12

(iii) Draw up a table showing the probability distribution of X.

(4 marks)

(iv) Calculate $E(X)$.

(2 marks)

(iv) Find the probability that X is greater than $E(X)$.

(2 marks)

--THE END--