INTI INTERNATIONAL COLLEGE PENANG
FOUNDATION IN BUSINESS INFORMATION TECHNOLOGY (CFPI)
STA1203 : BUSINESS STATISTICS
FINAL EXAMINATION (RESIT): AUGUST 2016 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) The waiting times for a random sample of 50 customers who visited Pizza Hut Shop are recorded. The following table gives the frequency distribution of waiting times (in minutes) for these customers.

Waiting Time	f
10 to less than 16	6
16 to less than 22	10
22 to less than 28	15
28 to less than 34	11
34 to less than 40	7
40 to less than 46	1

Construct an ogive for the data given. Estimate median from the graph.

(5 marks)

(b) The sales of Six Companies are given in the table below:

Company	Total Sales (billions of dollars)
General Motors	149
Wal-Mart Stores	406
General Electric	183
Citigroup	107
Exxon Mobil	426
Verizon Communication	97

Find the mean and variance sales for these six companies.

(7 marks)

(c) The probability distribution of discrete random variable X is shown in the table below :

x	-1	0	3	5
$P(X=x)$	0.13	0.35	k	0.30

(i) Find the value of k.

(3 marks)

(ii) Calculate the mean and variance of X.

(5 marks)

Question 2

(a) The following are the ages (in years) of all eight employees of a small company:

53 32 61 27 39 44 49 57

Find the mean, standard deviation and median of these data. (7 marks)

(b) A bag contains 10 blue and 7 yellow pens. Two beans are taken randomly at a time from the bag. Find the probability that both pens are yellow if

(i) replacement is not allowed. (3 marks)

(ii) replacement is allowed. (3 marks)

(c) Indicate which of the following variables are quantitative and which are qualitative.

(i) Number of persons in a family.

(ii) Colors of cars.

(iii) Marital status of people.

(iv) Time to commute from home to work.

(4 marks)

(d) Given $X \sim B(9,0.1)$. Find the mean of X. (3 marks)

Question 3

(a) The probability that a person is in favor of genetic engineering is 0.55 and that a person is against it is 0.45. Two persons are randomly selected, and it is observed whether they favor or oppose genetic engineering.

(i) Draw a tree diagram for this experiment. (4 marks)

(ii) Find the probability that at least one of the two persons favors genetic engineering. (3 marks)

(b) A discrete random variable X takes the values 0, 1, and 2 only. The probability distribution of X is shown in the following table where $0 < p < \frac{1}{4}$.

x	$P(x)$
0	$1-3p$
1	$2p$
2	p

Given Var $(x) = 0.5$, find two possible values for p. (7 marks)

(c) Find the following probabilities for the standard normal curve.

(i) $P(1.19 < z < 2.12)$ (3 marks)

(ii) $P(1.56 < z < 2.31)$ (3 marks)

Question 4

(a) Let x be a normal random variable with its mean equal to 40 and standard deviation equal to 5. Find the following probabilities for this normal distribution.

(i) $P(x > 55)$

(4 marks)

(ii) $P(x < 49)$

(4 marks)

(b) The following table shows speed (km/h) of 100 cars that pass a new road during a particular time period:

Speed (km/h)	Number of cars
55 – 59	4
60 – 64	29
65 – 69	33
70 – 74	20
75 – 79	9
80 – 84	5

(i) Find the mean and standard deviation from the data. (6 marks)

(ii) Draw a histogram for the data given. Estimate the mode from the graph.

(6 marks)

Question 5

(a) Indicate which of the following variables are continuous and which are discrete.

(i) Number of students in a class.

(ii) Lifetime of a battery.

(iii) Speeds of cars.

(iv) Time to machine failure.

(4 marks)

(b) The administration in a large city wanted to know the distribution of vehicles owned by households in that city. A sample of 40 randomly selected households from this city produced the following data on the number of vehicles owned.

5	1	1	2	0	1	1	2	1	1
1	3	3	0	2	5	1	2	3	4
2	1	2	2	1	2	2	1	1	1
4	2	1	1	2	1	1	4	1	3

(i) Construct a frequency distribution table for these data using single-valued classes.
(4 marks)

(ii) Find the mean, median and mode of the data set.
(8 marks)

(iii) What is the range? (1 mark)

(c) Given $Z \sim N(0,1^2)$. Find the $P(Z > 0.5)$. (3 marks)

Question 6

(a) A consumer agency randomly selected 1700 flights for two major airlines, A and B. The following table gives the two-way classification of these flights based on airline and arrival time. Note that "less than 30 minutes late" includes flights that arrived early or on time.

	Less Than 30 Minutes Late	30 Minutes to 1 Hour Late	More Than 1 Hour Late
Airline A	429	390	92
Airline B	393	316	80

(i) If one flight is selected at random from these 1700 flights, find the probability that this flight is more than 1 hour late given that it is a flight on airline A. (3 marks)

(ii) Are the events "airline A" and "more than 1 hour late" mutually exclusive? What about the events "less than 30 minutes late" and "more than 1 hour late?" Why or why not? (4 marks)

(iii) Are the events "airline B" and "30 minutes to 1 hour late" independent? Why or why not? (5 marks)

(b) The probability that a visitor to a bookstore will buy a book is 0.20. If 8 people have visited the bookstore at a particular period, find the probability that

(i) exactly 2 books are sold. (2 marks)

(ii) less than 1 units of books are sold. (3 marks)

(iii) exactly 1 book are not sold. (3 marks)

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