UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2012/2013

COURSE NAME	:	STATISTICS AND PROBABILITY 1
COURSE CODE	:	BWB 10103
PROGRAMME	:	1 BWQ
EXAMINATION DATE	:	DECEMBER 2012/JANUARY 2013
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS EXAMINATION PAPER CONSISTS OF **FOUR (4)** PAGES

Q1 (a) State the definition of statistics.

(2 marks)

(b) For the following observation, state the type of variables.
(i) Total saving account of customers in BIMB.
(ii) The level of satisfaction of UTHM's management.
(iii) Type of newspapers read by Malaysian.

(3 marks)

(c) State one advantage of collection data using walk-in interview.

(1 mark)

(d) Give two examples of abuses in statistics.

(2 marks)

(e) The following data represent the rainfall in mm for 35 days during a rainy season at Parit Raja.

45.4	50.4	50.2	50.3	50.5	50.4	50.1
56.7	49.2	49.7	49.6	49.3	49.0	49.5
55.4	50.1	50.2	50.3	51.0	53.7	52.1
47.6	48.5	49.8	48.9	52.2	50.5	53.8
49.8	50.0	50.1	51.3	50.4	49.7	50.1

(i) Construct the frequency distribution table.

(ii) Obtain the Pearson's coefficient of skewness and comment on the values obtained for ungrouped data. What is your conclusion?

(12 marks)

Q2 Based on the following set of data, answer the questions below,

-35.3, -25.5, -15.3, -5.6, -3.2, 0.7, 3.4, 7.7, 9.9, 12.7, 17.3, 25.3

(a) Find the mean, mode, median, standard deviation, Q1 and Q3 for these data.

(9 marks)

(b) Using the Chebyshev's theorem and empirical rule, is there any outliers data for the data set.

(4 marks)

(c) Draw a box-plot and give your conclusion based on this plot.

(7 marks)

Q3 The data in **Table Q3** show the various types of vegetables with different prices and quantities for the years 2000 and 2011.

Table Q3 : Types of vegetables with different prices and quantities for the years 2000 and 2011

Fruit	Price		Quantity	
	2000	2011	2000	2011
Apple	3.40	4.50	300	500
Orange	4.00	5.50	200	400
Grape	5.00	7.00	300	450

(a) Compute the percentage change in price for the individual fruits, using 2000 as the base year. Which fruit shows the highest percentage change?

(7 marks)

(b) Calculate the Laspeyres & Paasche price index for all types of fruits. What are your conclusions?

(13 marks)

Q4 (a) If the probability that student *A* will fail a certain statistics examination is 0.4, the probability that student *B* will fail the examination is 0.2, and the probability that the both student *A* and student *B* will fail the examination is 0.1, what is the probability that:

(i) At least one of these two students will fail the examination?
(ii) Neither student *A* nor student *B* will fail the examination?
(iii) Exactly one of these two students will fail the examination?

(10 marks)

(b) Given three coloured jars containing items as follows;

Red Jar : containing 3 gold coins and 4 silver coins
Green Jar : containing 4 gold coins and 3 silver coins
Blue Jar : containing 5 gold coins and 3 silver coins

A jar is selected at random from the above three and a coin is taken out

randomly.

(i) Construct a tree diagram representing this experiment and obtain its sample space.
(ii) If the selected coin is of gold type, find the probability that this coin is taken from the red jar.

(10 marks)

Q5 (a) The following functions can serve as probability distribution of the discrete random variable X:

$$P(X = x) = c(x^2 + 4) \text{ for } x = 0,\ 1,\ 2,\ 3$$

(i) Determine the value of c.
(ii) If $Y = 5 - 3X$, find E(Y) and V(Y).

(10 marks)

(b) Let k be a constant and consider the probability density function

$$f(x) = \begin{cases} k, & -1 < x < 0. \\ k(1+x), & 0 < x < 2. \\ 0, & \text{otherwise.} \end{cases}$$

(i) Find the value of k.
(ii) Calculate $P(-\frac{1}{2} < X < 1)$.
(iii) State the cumulative distribution function of X.

(10 marks)

- END OF QUESTION -

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Formula		
Chebyshev's Theorem	Empirical Rule	
$(1-\frac{1}{k^2})x100\%$ $k = 1, 2, 3$	P(z>1) = 0.1587,	P(z<2) = 0.02275, P(z<3) = 0.00135
$PCS = \frac{\bar{x} - \hat{x}}{s}$	Laspeyres PI = $\frac{\sum P_t Q_0}{\sum P_0 Q_0} x100$	Paasche PI = $\frac{\sum P_t Q_t}{\sum P_0 Q_t} x100$