



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Faculty of
Computer Science
and Information
Systems

UNIVERSITI TEKNOLOGI MALAYSIA

TEST 2

SUBJECT CODE : SCI1013
SUBJECT : DISCRETE STRUCTURE
TIME : 2 HOURS (8.15 P.M - 10.15 P.M)
DATE : 4 DECEMBER 2012

NAME :
MATRIC NO :
COURSE :
SECTION :
LECTURER'S NAME :

INSTRUCTIONS

THE TEST CONTAINS 4 QUESTIONS.

PLEASE ANSWER ALL QUESTIONS IN THE BOOKLET.

Question 1 [15 Marks]

- i) Bob, John, Luke and Tim play a tennis tournament. The rules of the tournament are such that at the end of the tournament a ranking will be made and there will be no ties. How many different rankings can there be? (4 marks)
- ii) There is a basket of fruit containing an apple, a banana and an orange and there are five girls who want to eat one fruit. How many ways are there to give three of the five girls one fruit each and leave two of them without a fruit to eat? (5 marks)
- iii) Registration numbers for a vehicle are to be made using four letters (using any letter of the alphabet) followed by three single-digit numbers. For example, WJDE209 is one such registration number. How many such registration numbers are possible if neither letters nor numbers can be repeated? (6 marks)

Question 2 [15 Marks]

- i) A computer gaming company employs 10 programmers, 6 graphic specialists and 3 creative designers. Determine the number of ways to select the project team of 7 based on the given conditions.
- a) A team of 4 programmers, 2 graphics specialists and 1 creative designer. (5 Marks)
- b) A team contains at least 3 programmers, at least 1 graphic specialist and exactly 2 creative designers. (5 Marks)
- ii) A candy shop carries 5 types of chocolates. Aminah wants to buy 8 chocolates. In how many ways can she do this? (5 Marks)

Question 3 [10 Marks]

- i) Suppose that two dice are rolled. Find the following events.
- a) The sum of the numbers rolled is 7 (1 Marks)
 - b) The product of the numbers rolled is 42 (1 Marks)
- ii) Let A and B be events in a sample space S such that $P(A) = 0.53$, $P(B) = 0.48$ and $P(A \cap B) = 0.22$. Find the following probabilities
- a) $P(A \cup B)$ (1 Marks)
 - b) $P(A \cap B')$ (1 Marks)
 - c) $P(B')$ (1 Marks)
 - d) $P[(A \cup B)']$ (1 Marks)
- iii) Find the probability that a 4 is obtained on one of the dice in a throw of two dice, given that the sum of digits on the upper faces is 7. (4 Marks)

Question 4 [10 Marks]

Suppose that 8% of the patients tested in a clinic are infected with bird flu. Furthermore, suppose that when a test for bird flu is given, 98% of the patients infected with bird flu test positive and the 3% of the patients not infected with bird flu test positive. What is the probability that :

- a) A patient testing positive for bird flu with this test is infected with it? (3 Marks)
- b) A patient testing positive for bird flu with this test is not infected with it? (2 Marks)
- c) A patient testing negative for bird flu with this test is infected with it? (3 Marks)
- d) A patient testing negative for bird flu with this test is not infected with it? (5 Marks)