



UNIVERSITI TEKNOLOGI MALAYSIA

SUBJECT CODE : **SCI1013**
SUBJECT : **DISCRETE STRUCTURE**
TIME : **2 HOURS (8.15 P.M - 10.15 P.M)**
DATE : **12 NOVEMBER 2014**

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

INSTRUCTIONS

THE TEST CONTAINS 5 QUESTIONS.

PLEASE ANSWER ALL QUESTIONS IN THE BOOKLET.

Question 1**[10 Marks]**

A father, mother, 2 boys, and 3 girls are asked to line up for a photograph. Determine the number of ways they can line up if

- a) there are no restrictions (1/2 marks)
- b) the parents stand together (3 marks)
- c) the parents do not stand together (1/2 marks)
- d) all the females stand together (3 marks)
- e) all the males cannot stand together (3 marks)

Question 2**[15 Marks]**

- a) There are 12 different-colored cubes in a bag. How many ways can Randall draw a set of 4 cubes from the bag? Determine whether the problem represents a permutation or combination.
(2 marks)
- b) Suppose there are 15 girls and 18 boys in a class. In how many ways can 2 girls and 2 boys be selected for a group project?
(5 marks)
- c) A pizza menu allows you to select 4 toppings at no extra charge from a list of 9 possible toppings. In how many ways can you select 4 or fewer toppings?
(8 marks)

Question 3**[7 Marks]**

According to a consumer study, the probable location of personal computers (PC) in the home is as follows:

1	Adult bedroom	0.03
2	Child bedroom	0.15
3	Other Bedroom	0.14
4	Office	0.40
5	Other room	0.28

- a) What is the probability that a PC is in a bedroom. (2 Marks)
- b) What is the probability it is not in a bedroom. (2 Marks)
- c) Suppose a household is selected at random from household with a PC in what room you expect to find a PC. (3 Marks)

Question 4**[8 Marks]**

A random sample of 200 adults are classified by gender and education level, as below

No	Education	Male	Female
1	Elementary	38	45
2	Secondary	28	50
3	College	22	17

If a person is picked at random from this group, find the probability that

- a) The person is a male. (1 Marks)
- b) The person has elementary education among female. (2 Marks)
- c) The person is a male, given that the person has a secondary education. (3 Marks)
- d) The person does not have a college degree, given that the person is female. (2 Marks)

Question 5**[10 Marks]**

Three different suppliers, X , Y and Z provide produce for a grocery store. Twelve percent of produce from X is superior grade, 8% of produce from Y is superior grade and 15% of produce from Z is superior grade. The store obtains 20% of its produce from X , 45% from Y and 35% from Z .

- a) What is the probability that a produce in the grocery store is obtain from supplier Y ? (2 Marks)
- b) If a piece of produce is purchased, what is the probability that it is superior grade? (2 Marks)
- c) If a piece of produce in the store is the superior grade, what is the probability that is from Z ? (3 Marks)
- d) What is the probability that the superior grade of produce in the store is from supplier X ? (3 Marks)