

**MATHEMATICS  
METHODS**

**Test 3 – Counting and Probability**

**Chapters 2 and 5**

**Semester 1 2015**

# 

**Calculator Assumed**

Time allowed for this section

Working time for this section: 45 minutes

Marks available: 40 marks

## Material required/recommended for this section

##### To be provided by the supervisor

This Question/Answer booklet

Formula sheet

##### To be provided by the candidate

Standard items: pens, pencils, pencil sharpener, eraser, correction fluid, ruler, highlighters

Special items: drawing instruments, templates, notes on one unfolded sheet of A4 paper, and up to three calculators satisfying the conditions set by the Curriculum Council for this course.

## Important note to candidates

No other items may be used in this section of the examination. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

1. (11 marks)  
   Consider the following sets:  
     
      
   1. Determine:
      1.  [1]
      2.  [2]
      3.  [2]
      4.  [2]
   2. State whether the following statements are True (T) or False (F)
      1.  [1]
      2.  [1]
      3.  [1]
      4.  [1]
2. (4 marks)  
   Two hundred (200) people were asked whether they had flown internationally (I) or domestically (D) in the past 12 months.
   * The ratio of those who had flown domestically to those who had not was 3:1
   * 10% had flown both internationally and domestically
   * A fifth of those who had not flown domestically, had flown internationally

Use the above information to complete the two-way table below.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Flown Internationally | Did not fly internationally | Total |
| Flown domestically |  |  |  |
| Did not fly domestically |  |  |  |
| Total |  |  |  |

1. (4 marks)  
   Use your knowledge of Pascal’s Triangle to answer the following question.
   1. Expand and simplify 
   2. Expand and simplify 

1. (7 marks)  
   Tom has 5 notes in his wallet: $100, $50, $20, $10 and $5.  
   1. If he chooses two notes at random, how many combinations can he make? [1]
   2. If he chooses three notes at random, how many combinations contain:
      1. a $5 note? [2]
      2. no $50 note? [2]
      3. either a $100 note or a $50 note? [2]
2. (6 marks)
   1. Hannah is getting married and wants to choose three of her 6 best friends to be her bridesmaids. How many choices does she have? [2]
   2. Young Seth is going on a camp. He is allowed to pack four shirts, 3 pants and 2 pairs of shoes. If he has 10 shorts, 5 pants and 4 pairs of shoes to choose from, how many choices does he have? [4]
3. (8 marks)

Tristan is the last one at a birthday party to choose two wrapped gifts from the ‘lucky dip’ bag. When it is his turn there are 2 toy cars, a bracelet a doll, a pack of cards and a puzzle left in the bag.   
  
He puts his hand in the bag without looking, chooses a wrapped gift, puts it aside and then returns his hand to the bag to choose his second wrapped gift.

* 1. Draw a tree diagram to represent all possible combinations of the gifts Tristan could select. [3]
  2. Determine the probability that Tristan chooses
     1. Two toy cars [1]
     2. A doll and a puzzle [1]
     3. A bracelet or a toy car [1]
     4. A puzzle if his first gift was a toy car [2]

**End of Test**