

DISCRETE MATHS (Q 6 & 7, PAPER 2)

LESSON NO. 3: COUNTING

2006

7 (a) The password for a mobile phone consists of five digits.

- (i) How many passwords are possible?
- (ii) How many of these passwords start with a 2 and finish with an odd digit?

2005

6 (a) How many three-digit numbers can be formed from the digits 1, 2, 3, 4, 5, if

- (i) the three digits are all different
- (ii) the three digits are all the same?

2005

7 (a) (i) How many different groups of four can be selected from five boys and six girls?

- (ii) How many of these groups consist of two boys and two girls?

2004

6 (a) A committee of five is to be selected from six students and three teachers.

- (i) How many different committees of five are possible?
- (ii) How many of these possible committees have three students and two teachers?

2004

7 (a) At the Olympic Games, eight lanes are marked on the running track. Each runner is allocated to a different lane. Find the number of ways in which the runners in a heat can be allocated to these lanes when there are

- (i) eight runners in the heat
- (ii) five runners in the heat and any five lanes may be used.

2003

- 6 (a) Eight people, including Kieran and Anne, are available to form a committee. Five people must be chosen for the committee.
- (i) In how many ways can the committee be formed if both Kieran and Anne must be chosen?
 - (ii) In how many ways can the committee be formed if neither Kieran nor Anne can be chosen?

2003

- 7 (a) Five cars enter a car park. There are exactly five vacant spaces in the car park.
- (i) In how many different ways can the five cars park in the vacant spaces?
 - (ii) Two of the cars leave the car park without parking. In how many different ways can the remaining three cars park in the five vacant spaces?

2002

- 6 (a) Nine friends wish to travel in a car. Only two of them, John and Mary, have licences to drive. Only five people can fit in the car (i.e. the driver and four others). In how many ways can the group of five people be selected if
- (i) both John and Mary are included
 - (ii) either John or Mary is included, but not both?
- Later, another one of the nine friends, Anne, gets a driving licence.
- (iii) The next time the journey is made, in how many ways can the group of five be chosen, given that at least one licenced driver must be included?

2001

- 6 (a) (i) How many different sets of three books or of four books can be selected from six different books?
- (ii) How many of the above sets contain one particular book?

2001

- 7 (a) (i) In how many different ways can four of the letters of the word FRIDAY be arranged if each letter is used no more than once in each arrangement?
- (ii) How many of the above arrangements begin with the letter D and end with a vowel?

ANSWERS

2006 7 (a) (i) 100,000 (ii) 5,000

2005 6 (a) (i) 60 (ii) 5

2005 7 (a) (i) 330 (ii) 150

2004 6 (a) (i) 126 (ii) 60

2004 7 (a) (i) 40,320 (ii) 6,720

2003 6 (a) (i) 20 (ii) 6

2003 7 (a) (i) 120 (ii) 60

2002 6 (a) (i) 35 (ii) 70 (iii) 120

2001 6 (a) (i) 35 (ii) 20

2001 7 (a) (i) 360 (ii) 24