

**PERMUTATION AND COMBINATION**

Form 5

Vol 09

**Part 2B – Permutation**

1. D

1. The required number

$$= P_4^6 \times 4! \times 2$$

$$= 17\,280$$

2. (a) The required number of arrangements

$$= 7!$$

$$= 5\,040$$

(b) The required number of arrangements

$$= 3 \times 4 \times 5!$$

$$= 1\,440$$

(c) The required number of arrangements

$$= P_2^3 \times 5! + P_2^4 \times 5!$$

$$= 2\,160$$

3. The required number of arrangements

$$= P_4^9 \times 8!$$

$$= 121\,927\,680$$

4. (a) The required number of arrangements

$$= 10 \times 10! \times 2$$

$$| \text{ or } 11! \times 2 - 10! \times 2$$

$$= 72\,576\,000$$

(b) The required number of arrangements

$$= 6 \times 6 \times 10! \times 2$$

$$= 261\,273\,600$$

5. (a) The required number  
 $= 10 \times 10 \times 10 \times 10$   
 $= 10\,000$

(b) The required number  
 $= 10 \times 9 \times 8 \times 7$   
 $= 5\,040$

6. (a) The required number  
 $= 26 \times 26 \times 900$   
 $= 608\,400$

(b) The required number  
 $= 26 \times 25 \times 900$   
 $= 585\,000$

(c) The required number  
 $= (26 \times 26 - 1) \times 8 \times 9 \times 9$   
 $= 437\,400$

7. (a) The required number  
 $= 5 \times 6 \times 6 \times 6$   
 $= 1\,080$

(b) The required number  
 $= 5 \times 6 \times 6 \times 2$   
 $= 360$

(c) The required number  
 $= 1 \times 5 \times 5 \times 5 + 4 \times 5 \times 5 \times 3$   
 $= 425$

(d) The required number  
 $= 1\,080 - 5 \times 5 \times 5 \times 5$   
 $= 455$

8. (a) The required number  
 $= 4 \times 4 \times 3 \times 2$   
 $= 96$

(b) The required number  
 $= 1 \times 3 \times 4 \times 3 + 3 \times 5 \times 4 \times 3$   
 $= 216$

9. (a) The required number

$$= 7 \times 8 \times 8 \times 5$$

$$= 2\,240$$

(b) The required number

$$= 6 \times 7 \times 7 \times 7 + 1 \times 7 \times 7 \times 7 + 6 \times 7 \times 7 \times 3$$

$$= 3\,283$$

(c) The required number

$$= 2 \times 8 \times 8 \times 8 + 1 \times 2 \times 8 \times 8$$

$$= 1\,152$$

10. (a) The required number

$$= 8 \times 8 \times 7 \times 6 \times 5$$

$$= 13\,440$$

(b) The required number

$$= 8 \times 7 \times 6 \times 5 \times 1 + 7 \times 7 \times 6 \times 5 \times 4$$

$$= 7\,560$$

(c) The required number

$$= 1 \times 8 \times 7 \times 6 \times 5 + 5 \times 8 \times 7 \times 6 \times 5$$

$$= 10\,080$$

(d) The required number

$$= 5 \times 8 \times 7 \times 6 \times 5 + 1 \times 5 \times 7 \times 6 \times 5$$

$$= 9\,450$$

(e) The required number

$$= 3 \times 8 \times 7 \times 6 \times 5 + 1 \times 1 \times 1 \times 6 \times 5 + 1 \times 1 \times 1 \times 1 \times 5$$

$$= 5\,075$$