Permutations and combinations – 2021 O Level Additional Math

1. Nov/2021/Paper_12/No.8

(a) A 5-digit number is made using the digits 0, 1, 4, 5, 6, 7 and 9. No digit may be used more than once in any 5-digit number. Find how many such 5-digit numbers are even and greater than 50 000. [3]

(b) The number of combinations of n objects taken 4 at a time is equal to 6 times the number of combinations of n objects taken 2 at a time. Calculate the value of n. [5]

2. Nov/2021/Paper_13/No.6

(a) A 5-digit number is made using the digits 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. No digit may be used more than once in any 5-digit number. Find how many such 5-digit numbers are odd and greater than 70 000. [3]

(b) The number of combinations of n objects taken 3 at a time is 2 times the number of combinations of n objects taken 2 at a time. Find the value of n. [4]

3. June/2021/Paper_11/No.6

(a) **(i)** Find how many different 5-digit numbers can be formed using the digits 1, 3, 5, 6, 8 and 9. No digit may be used more than once in any 5-digit number. [1]

(ii) How many of these 5-digit numbers are odd? [1]

(iii) How many of these 5-digit numbers are odd and greater than 60 000? [3]

(b) Given that $45 \times {}^{n}\mathrm{C}_{4} = (n+1) \times {}^{n+1}\mathrm{C}_{5}$, find the value of n. [4]

4. June/2021/Paper_12/No.7

(a) A six-character password is to be made from the following eight characters.

Digits	1	3	5	8	9
Symbols	*	$	#		

No character may be used more than once in a password.

Find the number of different passwords that can be chosen if

(i) there are no restrictions, [1]

(ii) the password starts with a digit and finishes with a digit, [2]

(iii) the password starts with three symbols. [2]

(b) The number of combinations of 5 objects selected from n objects is six times the number of combinations of 4 objects selected from $n-1$ objects. Find the value of n. [3]

5. June/2021/Paper_14/No.5

(a) A 5-digit number is to be formed from the digits 2, 5, 6, 7 and 9. Each digit may only be used once.

(i) Find the number of different 5-digit numbers that can be formed. [1]

(ii) Find the percentage of these numbers that are odd. [2]

(b) 12 people are placed at random in 3 groups of 4 people each. Find the number of ways that this can be done. [3]