

XI SCIENCE

HOMEWORK

PERMUTATIONS

1. Evaluate:

(i) ${}^{10}P_4$

(ii) ${}^{62}P_3$

(iii) 6P_6

(iv) 9P_0

2. Prove that ${}^9P_3 + 3 \times {}^9P_2 = {}^{10}P_3$.

3. (i) If ${}^nP_5 = 20 \times {}^nP_3$, find n .

(ii) If $16 \times {}^nP_3 = 13 \times {}^{n+1}P_3$, find n .

(iii) If ${}^{2n}P_3 = 100 \times {}^nP_2$, find n .

4. (i) If ${}^5P_r = 2 \times {}^6P_{r-1}$, find r .

(ii) If ${}^{20}P_r = 13 \times {}^{20}P_{r-1}$, find r .

(iii) If ${}^{11}P_r = {}^{12}P_{r-1}$, find r .

5. (i) If ${}^nP_4 : {}^nP_5 = 1 : 2$, find n .

(ii) If ${}^{n-1}P_3 : {}^{n+1}P_3 = 5 : 12$, find n .

6. If ${}^{15}P_{r-1} : {}^{16}P_{r-2} = 3 : 4$, find r .

7. If ${}^{2n-1}P_n : {}^{2n+1}P_{n-1} = 22 : 7$, find n .

8. Find n , if ${}^{n+5}P_{n+1} = \frac{11}{2}(n-1) \cdot {}^{n+3}P_n$.

9. Prove that $1 + 1 \cdot {}^1P_1 + 2 \cdot {}^2P_2 + 3 \cdot {}^3P_3 + \dots + n \cdot {}^nP_n = {}^{n+1}P_{n+1}$.

10. Find the number of permutations of 10 objects, taken 4 at a time.

ANSWERS:

1. (i) 5040 (ii) 226920 (iii) 720 (iv) 1 3. (i) $n = 8$ (ii) $n = 15$ (iii) $n = 13$

4. (i) $r = 3$ (ii) $r = 8$ (iii) $r = 9$ 5. (i) $n = 6$ (ii) $n = 8$

6. $r = 14$ 7. $n = 10$ 8. $n = 6$ or $n = 7$ 10. 5040