

Q12 Find the number of words with or without meaning which can be made using all the letters of the word AGAIN. If these words are written as in a dictionary, find the 50<sup>th</sup> word.

Q13. Prove that  ${}^n C_r + {}^n C_{r-1} = {}^{n+1} C_r$

Q14 Find  $(x+1)^6 + (x-1)^6$  Hence evaluate  $(\sqrt{2}+1)^6 + (\sqrt{2}-1)^6$

Q15 Find the Sum of the Sequence 7, 77, 777, 7777, ... to n terms

Q16 If  $a, b, c, d$  are in G.P, Show that

$$(a^2 + b^2 + c^2)(b^2 + c^2 + d^2) = (ab + bc + cd)^2$$

Q17 Find the Sum to n terms of the Series:

$$5 + 11 + 19 + 29 + 41 \dots$$

Q18 If  $P$  is the length of perpendicular from the origin to the line whose intercepts on the axes are  $a$  and  $b$ ,

$$\text{then show that } \frac{1}{P^2} = \frac{1}{a^2} + \frac{1}{b^2}$$

Q19 An arch is in the form of a parabola with its axis vertical. The arch is 10m high and 5m wide at the base. How wide is it 2m from the vertex of the parabola?

Q20 Check if  $A(3, 6, 9)$   $B(10, 20, 30)$   $C(25, -41, 5)$  are the vertices of a right angled  $\Delta$ .