

Q) Let $p(x)$ be a quadratic polynomial such that $p(0)=1$. If $p(x)$ leaves remainder 4 when divided by $x-1$ and it leaves remainder 6 when divided by $x+1$; then :

A) $P(2) = 11$

B) $P(2) = 19$

C) $P(-2) = 19$

D) $P(-2) = 11$

Solution:

Let, $P(x) = ax^2 + bx + c$

As, $P(0) = 1$,

$$\therefore a(0)^2 + b(0) + c = 1$$

$$\Rightarrow c = 1$$

$$\therefore P(x) = ax^2 + bx + 1$$

If $P(x)$ is divided by $x - 1$, remainder = 4

$$\Rightarrow P(1)=4$$

$$\therefore a + b + 1 = 4 \dots\dots (1)$$

If $P(x)$ is divided by $x + 1$, remainder = 6

$$\Rightarrow P(-1) = 6$$

$$\therefore a - b + 1 = 6 \dots\dots(2)$$

By solving (1) and (2) we get,

$$a = 4, \text{ and } b = -1$$

$$\therefore P(x) = 4x^2 - x + 1$$

$$P(2) = 4(2)^2 - 2 + 1 = 15$$

$$P(-2) = 4(-2)^2 - (-2) + 1 = 19$$