Exercise 2C

Question 11:

Let $f(x) = (x^4 - 2x^3 + 3x^2 - ax + b)$

$\therefore$ From the given information,

$f(1) = 1^4 - 2(1)^3 + 3(1)^2 - a(1) + b = 5$

$\Rightarrow 1 - 2 + 3 - a + b = 5$

$\Rightarrow 2 - a + b = 5$ ....(i)

And,

$f(-1) = (-1)^4 - 2(-1)^3 + 3(-1)^2 - a(-1) + b = 19$

$\Rightarrow 1 + 2 + 3 + a + b = 19$

$\Rightarrow 6 + a + b = 19$ ....(ii)

Adding (i) and (ii), we get

$\Rightarrow 8 + 2b = 24$

$\Rightarrow 2b = 24 - 8 = 16$

$\Rightarrow b = 16/2 = 8$

Substituting the value of b = 8 in (i), we get

$2 - a + 8 = 5$

$\Rightarrow -a + 10 = 5$

$\Rightarrow -a = -10 + 5$

$\Rightarrow -a = -5$

$\Rightarrow a = 5$

$\therefore a = 5$ and $b = 8$

$f(x) = x^4 - 2x^3 + 3x^2 - ax + b$

$= x^4 - 2x^3 + 3x^2 - 5x + 8$

$\therefore f(2) = (2)^4 - 2(2)^3 + 3(2)^2 - 5(2) + 8$

$= 16 - 16 + 12 - 10 + 8$

$= 20 - 10 = 10$

$\therefore$ The required remainder is 10.

********** END **********