

1(i)

$$\begin{aligned} \text{let } p(x) &= x^3 - 4x^2 + 5x - 2 \\ p(2) &= 2^3 - 4 \times 2^2 + 5 \times 2 - 2 \\ &= 8 - 16 + 10 - 2 \\ &= 18 - 18 \\ &= 0 \end{aligned}$$

$\therefore 2$  is a zero of  $p(x)$

$$\begin{aligned} p(1) &= 1^3 - 4 \times 1^2 + 5 \times 1 - 2 \\ &= 1 - 4 + 5 - 2 \\ &= 6 - 6 \\ &= 0 \end{aligned}$$

$\therefore 1$  is a zero of  $p(x)$

$$\begin{aligned} \text{Sum of zeros} &= 2 + 1 + 1 \\ &= \frac{4}{1} \\ &= -\frac{(-4)}{1} \\ &= -\frac{b}{a} \end{aligned}$$

$$\begin{bmatrix} b = -4 \\ a = 1 \end{bmatrix}$$

$$\begin{aligned} \text{Product of zeros} &= 2 \times 1 \times 1 \\ &= \frac{2}{1} \\ &= -\frac{(-2)}{1} \\ &= -\frac{d}{a} \quad [\because d = -2] \\ &\quad [a = 1] \end{aligned}$$

Sum of product taking two at a time

$$\begin{aligned} &= 2 \times 1 + 1 \times 1 + 1 \times 2 \\ &= \frac{5}{1} \end{aligned}$$

$$= \frac{c}{a} \quad [\because c = 5] \\ \quad [a = 1]$$

$$\textcircled{2} \text{ Sum of zeros (S)} = \frac{2}{1} = -\frac{(-2)}{1} = -\frac{b}{a}$$

$$\text{Product of zeros (P)} = -\frac{14}{1} = -\frac{d}{a}$$

$$\begin{aligned} \text{Sum of product taking} \\ \text{two at a time (SP)} &= -\frac{7}{1} \\ &= \frac{c}{a} \end{aligned}$$

$$\begin{aligned} \therefore a = 1, b = -2, c = -7 \\ d = 14 \end{aligned}$$

required polynomial

$$x^3 - 2x^2 - 7x + 14$$