CBSE TEST PAPER-01

CLASS - Mathematics (Polynomials)

[ANSWERS]

Ans01. (d) Ans02. (d)

Ans03. (b) Ans04. (b)

Ans05. Polynomial $x^2-9x+\frac{1}{9}$ i.e. $\frac{1}{9}\left[9x^2-9^2x+1\right]$

Ans06. $f(x)=x^2-x-4$ i.e.

If α and β are the zeroes

$\therefore \quad \alpha+\beta=\frac{1}{1}=1$

$\alpha.\beta=\frac{-4}{1}=-4$

So,

$$\frac{1}{\alpha}+\frac{1}{\beta}-\alpha\beta=\frac{\alpha+\beta}{\alpha\beta}-\alpha\beta$$

$$=\frac{1}{-4}-(-4)$$

$$=-\frac{1}{4}+4$$

$$=\frac{15}{4}$$

Ans07.

$$\alpha+\beta=-p$$

$$\alpha\beta=45$$

$$(\alpha-\beta)^2=144$$

$$\Rightarrow \alpha^2+\beta^2-2\alpha\beta$$

$$\Rightarrow (\alpha+\beta)^2-4\alpha\beta=144$$

$$\Rightarrow \quad (-p)^2-4\times45=144$$

$$\Rightarrow \quad p^2=144+180$$

$$\Rightarrow \quad p=\pm18$$

Ans08.

$$
\begin{array}{l}
\qquad\qquad 2x^2+5x+3 \\
3x-7\overline{)6x^3+x^2-26x-21} \\
\quad \underline{-6x^3 \mp 14x^2} \\
\qquad\quad 15x^2-26x-21 \\
\quad \underline{-15x^2 \mp 35x} \\
\qquad\qquad\quad 9x-21 \\
\qquad\quad \underline{-9x \mp 21} \\
\qquad\qquad\quad 0
\end{array}
$$

$\therefore \quad quotient = 2x^2+5x+3$

Ans09. $f(x) = g(x)\times q(x) + r(x)$

$$
\begin{array}{l}
\qquad\qquad\quad x-7 \\
x^2+x+1\overline{)x^3-6x^2+11x-6} \\
\quad \underline{-x^3 \mp x^2 \mp x} \\
\qquad\quad -7x^2+10x-6 \\
\quad \underline{\mp 7x^2 \mp 7x \mp 7} \\
\qquad\qquad\quad -17x+1
\end{array}
$$

$\therefore \quad \left(x^3-6x^2+11x-6\right) = x^2+2x+1\left(x-7\right)+\left(17x+1\right)$

Ans10. Two zeros are $2\pm\sqrt{3}$

$\therefore$ *Sum* of zeros $= 4$

and product of the zeros $= 1$

$\therefore \quad \left(x^2-4x+1\right)$ is the factor of $x^4-6x^3-26x^2+138x-35$

$$
\begin{array}{l}
\qquad\qquad\quad x^2-2x-35 \\
x^2-4x+1\overline{)x^4-6x^3-26x^2+138x-35} \\
\quad \underline{-x^4 \mp 4x^3 \mp x^2} \\
\qquad\quad -2x^3-27x^2+138x-35 \\
\quad \underline{\mp 2x^3 \mp 8x^2 \mp 2x} \\
\qquad\qquad\quad -35x^2+140x-35 \\
\qquad\quad \underline{\mp 35x^2 \mp 140x \mp 35} \\
\qquad\qquad\quad 0
\end{array}
$$

Now,

$$x^2-2x-35$$
$$=x^2-7x+5x-35$$
$$=x(x-7)+5(x-7)$$
$$=(x-5)(x-7)$$
$\therefore$ Zeros are
$x=7$ and $x=-5$
$\therefore$ Other two zeros are 7 *and* -5

Ans11.

$$\begin{array}{r} x^2+6x+8 \\ x^2-4x+3\overline{)x^4+2x^3-13x^2-12x+21} \\ \underline{-x^4\mp 4x^3\pm 3x^2} \\ 6x^3-16x^2-12x+21 \\ \underline{-6x^3\mp 14x^2\pm 18x} \\ 8x^2-30x+21 \\ \underline{-8x^2\mp 32x\pm 24} \\ 2x-3 \end{array}$$

We must be subtract (2x – 3) to become a factor.

Ans12.

$$\begin{array}{r} x^2+6x+8 \\ 3x^2-2x+4\overline{)6x^5+5x^4+11x^3-3x^2+x+5} \\ \underline{-6x^5\mp 4x^4\pm 8x^3} \\ 9x^4+3x^3-3x^2+x+5 \\ \underline{-9x^4\mp 6x^3\pm 12x^2} \\ 9x^3-15x^2+x+5 \\ \underline{-9x^3\mp 6x^2\pm 12x} \\ -9x^2-11x+5 \\ \underline{\mp 9x^2\pm 6x\mp 12} \\ -17x+17 \end{array}$$

So we must be added $\left(3x^2-2x+4\right)-\left(-17x+17\right)$

$$=3x^2-2x+4+17x-17$$
$$=3x^2+15x-13$$