OSF EDUCATION
Std 10 : Maths(50)
IMP QUESTIONS DAY 1

Chapters : 1&2 | Date : 31/12/24
Total Marks : 29 | Time : 02 Hour

Section A

- **Write the answer of the following questions. [Each carries 1 Mark]** **[3]**

1. If HCF $(x, y) = 1$ then HCF $(x - y, x + y) =$ ....

(A) 4 (B) 1 or 2 (C) x or y (D) $x + y$ or $x - y$

2. LCM $(a, 18) = 36$ HCF $(a, 18) = 2$ then $a =$ ....

(A) 2 (B) 3 (C) 4 (D) 1

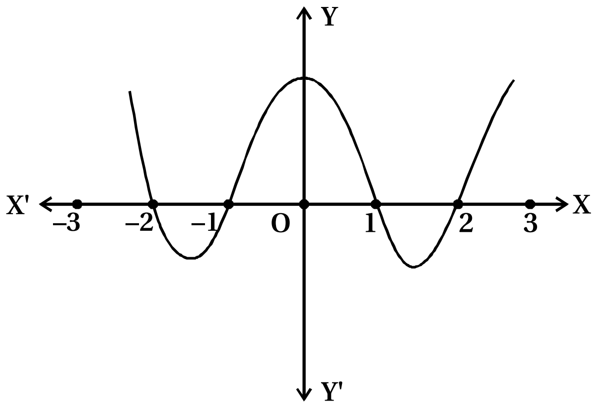
3. Numbers at zeros at the graph at $p(x)$ between 0 and 4 are ......

(A) 3

(B) 6

(C) 2

(D) 4



Section B

- **Write the answer of the following questions. [Each carries 2 Marks]** **[14]**

4. Prove that the given is irrational : $7\sqrt{5}$

5.

(A)		(B)
i)	.... is not an irrational number.	(a) $3 + \sqrt{3}$
ii)	.... is not a rational number.	(b) $\sqrt{4}$
		(c) $\frac{4}{0}$

6. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively : $-\frac{1}{4}, \frac{1}{4}$

7. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively : $\frac{1}{4}, -1$

8.

	(A)	(B)
i)	If α, β and γ are zeroes of a polynomial $p(x) = ax^3 + bx^2 + cx + d$ $(a \neq 0)$ then their product $\alpha\beta\gamma$ = ...	(a) $\frac{-b}{c}$
ii)	If α and β are zeroes of a quadratic polynomial $ax^2 + bx + c$, then $\frac{1}{\alpha} + \frac{1}{\beta}$ = ...	(b) $\frac{-c}{a}$
		(c) $\frac{-d}{a}$

9. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively : $0, \sqrt{5}$

10. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively : 4, 1

Section C

- **Write the answer of the following questions.** [**Each carries 3 Marks**] **[12]**

11. Prove that $\sqrt{5}$ is irrational.

12. Find the zeroes of the following quadratic polynomial and verify the relationship between the zeroes and the coefficients : $6x^2 - 3 - 7x$

13. Find the zeroes of the following quadratic polynomial and verify the relationship between the zeroes and the coefficients : $t^2 - 15$

14. Find the zeroes of the following quadratic polynomial and verify the relationship between the zeroes and the coefficients : $x^2 - 2x - 8$

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Section [A] : 1 Marks Questions					
No	Ans	Chap	Sec	Que	Universal_QueId
1.	B	Chap 1	S5	2	QP24P11B1011_P1C1S5Q2
2.	C	Chap 1	S5	5	QP24P11B1011_P1C1S5Q5
3.	C	Chap 2	S5	2	QP24P11B1011_P1C2S5Q2

Section [B] : 2 Marks Questions					
No	Ans	Chap	Sec	Que	Universal_QueId
4.	-	Chap 1	S3	3.2	QP24P11B1011_P1C1S3Q3.2
5.	-	Chap 1	S11	3	QP24P11B1011_P1C1S11Q3
6.	-	Chap 2	S3	2.5	QP24P11B1011_P1C2S3Q2.5
7.	-	Chap 2	S3	2.1	QP24P11B1011_P1C2S3Q2.1
8.	-	Chap 2	S11	1	QP24P11B1011_P1C2S11Q1
9.	-	Chap 2	S3	2.3	QP24P11B1011_P1C2S3Q2.3
10.	-	Chap 2	S3	2.6	QP24P11B1011_P1C2S3Q2.6

Section [C] : 3 Marks Questions					
No	Ans	Chap	Sec	Que	Universal_QueId
11.	-	Chap 1	S3	1	QP24P11B1011_P1C1S3Q1
12.	-	Chap 2	S3	1.3	QP24P11B1011_P1C2S3Q1.3
13.	-	Chap 2	S3	1.5	QP24P11B1011_P1C2S3Q1.5
14.	-	Chap 2	S3	1.1	QP24P11B1011_P1C2S3Q1.1

OSF EDUCATION

Std 10 : Maths(50)

IMP QUESTIONS DAY 1

Chapters : 1&2
Total Marks : 3

Date : 31/12/24
Time : 01 Hour

Student Name : ____________________

Roll Number : 0 1 2   0 1 2 3 4 5 6 7 8 9   0 1 2 3 4 5 6 7 8 9

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○

OSF EDUCATION

Std 10 : Maths(50)

IMP QUESTIONS DAY 1

Chapters : 1&2
Total Marks : 3

Date : 31/12/24
Time : 01 Hour

Student Name : ____________________

Roll Number : 0 1 2   0 1 2 3 4 5 6 7 8 9   0 1 2 3 4 5 6 7 8 9

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○

Chapters : 1&2
Total Marks : 3

OSF EDUCATION
Std 10 : Maths(50)
IMP QUESTIONS DAY 1

Date : 31/12/24
Time : 01 Hour

OMR ANSWER SHEET

Marks Identifier : ○○○○○○○○○○○○○○○○○○○○○○○○○○○○

	A	B	C	D
1.	○	●	○	○
2.	○	○	●	○
3.	○	○	●	○

Chapters : 1&2
Total Marks : 3

OSF EDUCATION
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IMP QUESTIONS DAY 1

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OMR ANSWER SHEET

Marks Identifier : ○○○○○○○○○○○○○○○○○○○○○○○○○○○○

	A	B	C	D
1.	○	●	○	○
2.	○	○	●	○
3.	○	○	●	○

Section A

- **Write the answer of the following questions. [Each carries 1 Mark]** **[3]**

1. If HCF $(x, y) = 1$ then HCF $(x - y, x + y) =$ ....

(A) 4 (B) 1 or 2 (C) x or y (D) $x + y$ or $x - y$

Ans. **(B) 1 or 2**

➤ Let HCF $(x - y, x + y) = d$

$\therefore \frac{x - y}{d}$ or $\frac{x + y}{d}$

$\therefore \frac{x - y}{d} = m$ or $\frac{x + y}{d} = n$

$\therefore x - y = md$ ....(i) and $x + y = nd$ ....(ii)

Adding (i) and (ii) we get

$2x = md + nd$

$\therefore 2x = (m + n)d$

Subtracting (i) from (ii), we get

$2y = nd - md$

$\therefore 2y = (n - m)d$

$\therefore$ Now HCF $(x, y) = 1$

$\therefore 2 \times$ HCF $(x, y) = 2 \times 1$

$\therefore$ HCF $((m + n)\ d, (n - m)\ d) = 2$

$d \times$ HCF $(m + n, n - m) = 2 \times 1$

$d = 2$ or 1

Hence, HCF $(x - y, x + y) = d$

and $d = 2$ or 1

2. LCM $(a, 18) = 36$ HCF $(a, 18) = 2$ then $a =$ ....

(A) 2 (B) 3 (C) 4 (D) 1

Ans. **(C) 4**

➤ $a \times 18 =$ LCM $\times$ HCF

$a \times 18 = 36 \times 2$

$\therefore a = \frac{36 \times 2}{18}$

$= 4$

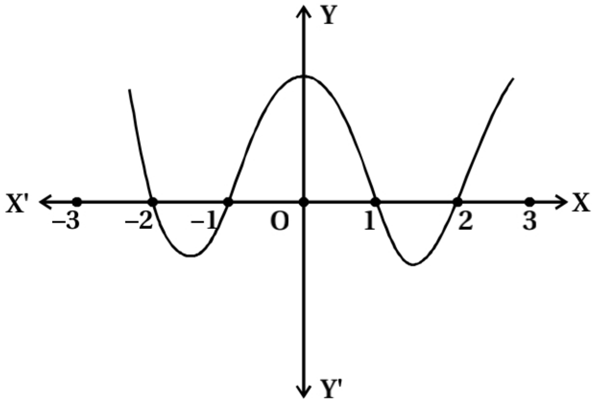
3. Numbers at zeros at the graph at $p(x)$ between 0 and 4 are ......

(A) 3

(B) 6

(C) 2

(D) 4



Ans. (C) 2

➤ Numbers of zeros at the graph at $p(x)$ between 0 and 4 are 2.

Section B

● **Write the answer of the following questions.** [**Each carries 2 Marks**] **[14]**

4. Prove that the given is irrational : $7\sqrt{5}$

➤ Let us assume that $7\sqrt{5} = m$ is rational

$\therefore \sqrt{5} = \frac{m}{7}$

But $\sqrt{5}$ is irrational

So, this is contradiction

$\therefore 7\sqrt{5}$ is irrational

5.

(A)		(B)
i)	.... is not an irrational number.	(a) $3 + \sqrt{3}$
ii)	.... is not a rational number.	(b) $\sqrt{4}$
		(c) $\frac{4}{0}$

➠ (i – b), (ii – a)

6. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively : $-\frac{1}{4}, \frac{1}{4}$

➤ Let α and β are the zeroes of the quadratic polynomial sum of the zeroes $= \alpha + \beta = -\frac{b}{a} = -\frac{1}{4}$

Product of the zeroes $\alpha\beta = \frac{c}{a} = \frac{1}{4}$

➤ Required quadratic polynomial

$= x^2 - (\alpha + \beta)\, x + \alpha\beta$

$= x^2 - \left(-\frac{1}{4}\right) x + \frac{1}{4}$

$= x^2 + \frac{x}{4} + \frac{1}{4}$

$= \frac{4x^2 + x + 1}{4}$

$= \frac{1}{4}(4x^2 + x + 1)$

Hence, the required quadratic polynomial is $\frac{1}{4}(4x^2 + x + 1)$

7. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively : $\frac{1}{4}, -1$

➤ Let α and β are the zeroes of the quadratic polynomial.

$\therefore$ Sum of the zeroes $= \alpha + \beta = -\frac{b}{a} = \frac{1}{4}$

and product of the zeroes $\alpha\beta = \frac{c}{a} = -1$

Required quadratic polynomial $= x^2 - (\alpha + \beta)x + \alpha B$

$$= x^2 - \left(\frac{1}{4}\right)x + (-1)$$

$$= x^2 - \frac{x}{4} - 1$$

$$= \frac{x^2}{1} - \frac{x}{4} - \frac{1}{1}$$

$$= \frac{4x^2 - x - 4}{4}$$

$$= \frac{1}{4}(4x^2 - x - 4)$$

Hence, The required quadratic polynomial is $\frac{1}{4}(4x^2 - x - 4)$

8.

	(A)	(B)
i)	If α, β and γ are zeroes of a polynomial $p(x) = ax^3 + bx^2 + cx + d$ $(a \neq 0)$ then their product $\alpha\beta\gamma$ = ...	(a) $\frac{-b}{c}$
ii)	If α and β are zeroes of a quadratic polynomial $ax^2 + bx + c$, then $\frac{1}{\alpha} + \frac{1}{\beta}$ = ...	(b) $\frac{-c}{a}$
		(c) $\frac{-d}{a}$

➠ (i – c), (ii – a)

9. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively : $0, \sqrt{5}$

➤ Let α and β are the zeroes of quadratic equation.

Sum of the zeroes $= \alpha + \beta = -\frac{b}{a} = 0$

Product of the zeroes $= \alpha\beta = \frac{c}{a} = \sqrt{5}$

$\therefore$ Required quadratic polynomial

$= x^2 - (\alpha + \beta)x + \alpha\beta$

$= x^2 - (0)\ x + \left(\sqrt{5}\right)$

$= x^2 - (0)x + \sqrt{5}$

$= x^2 + \sqrt{5}$

Hence, The required quadratic polynomial is $x^2 + \sqrt{5}$

10. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively : 4, 1

➤ Let α and β are the zeroes of the quadratic polynomial.

Sum of the zeroes $= \alpha + \beta = -\dfrac{b}{a} = 4$

Product of the zeroes $= \alpha\beta = \dfrac{c}{a} = 1$

$\therefore$ Required quadratic polynomial

$= x^2 - (\alpha + \beta)\ x + \alpha\beta$

$= x^2 - 4x + 1$

Hence, the required quadratic polynomial is $x^2 - 4x + 1$

Section C

● **Write the answer of the following questions.** [Each carries 3 Marks] **[12]**

11. Prove that $\sqrt{5}$ is irrational.

➤ Let us assume, to the contrary that $\sqrt{5}$ is rational.

That is, we can find coprime a and b $(b \neq 0)$ such that

$\sqrt{5} = \dfrac{a}{b}$

$\therefore a = \sqrt{5}b$

$\therefore a^2 = 5b^2$ ($\because$ squaring both sides)

$\therefore 5|a^2$ (a^2 divides by 5)

$\therefore 5|a$ (a divides by 5)

Let $a = 5a_1,\ a_1 \in \mathrm{N}$

$\therefore 25a_1^2 = a^2 = 5b^2$

$\therefore b^2 = 5a_1^2$

$\therefore 5|b^2$ (b^2 divides by 5)

$\therefore 5|b$ (b divides by 5)

Thus $5|a$ and $5|b$ (a and b divide by 5)

But this contradicts the fact that a and b have no common factor other than 1.

So, we conclude that $\sqrt{5}$ is irrational.

12. Find the zeroes of the following quadratic polynomial and verify the relationship between the zeroes and the coefficients : $6x^2 - 3 - 7x$

➤ $\therefore\ 6x^2 - 7x - 3$ (Arrang in decending power of x)

Let $p(x) = 6x^2 - 7x - 3$

$= 6x^2 - (9 - 2)\ x - 3$

$= 6x^2 - 9x + 2x - 3$

$= 3x(2x - 3) + 1(2x - 3)$

$= (2x - 3)\ (3x + 1)$

➤ To find the zeroes of $p(x)$, we have $p(x) = 0$

$p(x) = (2x - 3)\ (3x + 1)$

$0 = (2x - 3)\ (3x + 1)$

$\therefore\ 2x - 3 = 0$	$3x + 1 = 0$
$\therefore\ 2x = 3$	$\therefore\ 3x = -1$
$\therefore\ x = \frac{3}{2}$	$\therefore\ x = \frac{-1}{3}$

Hence, $\frac{3}{2}$ and $-\frac{1}{3}$ are the zeroes of the given polynomial $6x^2 + 7x - 3$.

➤ $p(x) = 6x^2 - 7x - 3$ comparing with $ax^2 + bx + c$ we get $a = 6$, $b = -7$, $c = -3$

Sum of the zeroes $= \left(\frac{3}{2}\right) + \left(-\frac{1}{3}\right) = \frac{-(-7)}{6} = \frac{-b}{a} = -\frac{(\text{coefficient of } x)}{\text{coefficient of } x^2}$

Product of the zero $= \frac{3}{2} \times \frac{-1}{3} = \frac{-3}{6} = \frac{c}{a} = \frac{\text{constant term}}{\text{coefficient of } x^2}$

13. Find the zeroes of the following quadratic polynomial and verify the relationship between the zeroes and the coefficients : $t^2 - 15$

➤ Let $p(t) = t^2 - 15$

$= (t)^2 - \left(\sqrt{15}\right)^2$

$= \left(t - \sqrt{15}\right)\left(t + \sqrt{15}\right)$

➤ To find the zeroes of $p(t)$ we take $p(t) = 0$.

$p(t) = \left(t - \sqrt{15}\right)\left(t + \sqrt{15}\right)$

$\therefore\ 0 = \left(t - \sqrt{15}\right)\left(t + \sqrt{15}\right)$

$\therefore\ t - \sqrt{15} = 0$ or $t + \sqrt{15} = 0$

$\therefore\ t = \sqrt{15}$ or $t = -\sqrt{15}$

Hence, $\sqrt{15}$ and $-\sqrt{15}$ are the zeroes of $t^2 - 15$.

➤ $p(t) = t^2 - 15$ comparing with $ax^2 + bx + c$, we get

$a = 1$, $b = 0$, $c = -15$

➤ Sum of the zeroes $= \left(\sqrt{15}\right) + \left(-\sqrt{15}\right) = 0$

$= \frac{-(0)}{1} = -\frac{b}{a} = -\frac{(\text{coefficient of } t)}{\text{coefficient of } t^2}$

➤ Product of the zeroes = $\left(\sqrt{15}\right) \times \left(-\sqrt{15}\right) = -15$

$$= \frac{-15}{1} = \frac{c}{a} = \frac{\text{constant term}}{\text{coefficient of } t^2}$$

14. Find the zeroes of the following quadratic polynomial and verify the relationship between the zeroes and the coefficients : $x^2 - 2x - 8$

➤ Let $p(x) = x^2 - 2x - 8$

$= x^2 - (4 - 2)x - 8$

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

$= x(x - 4) + 2(x - 4)$

$= (x - 4)(x + 2)$

➤ To find the zeroes of $p(x)$ we take $p(x) = 0$.

$p(x) = (x - 4)(x + 2)$

$0 = (x - 4)(x + 2)$

$\therefore x - 4 = 0$ | $x + 2 = 0$

$\therefore x = 4$ | $\therefore x = -2$

Hence, 4 and –2 are zeroes of the polynomial $x^2 - 2x - 8$.

➤ Compare $p(x) = x^2 - 2x - 8$ to $ax^2 + bx + c$, $a = 1$, $b = -2$, $c = -8$

Sum of the zeroes = $(4) + (-2) = +2 = -\frac{-2}{1} = -\frac{b}{a}$

$$= -\frac{\text{coefficent of } x}{\text{coefficient of } x^2}$$

Product of the zeroes = $(4) \times (-2) = -8$

$$= \frac{-8}{1} = \frac{c}{a} = \frac{\text{constant term}}{\text{coefficient of } x^2}$$