PRISM WORLD

Std.: 9 (English) **Maths - I** **Marks: 40**

Date: **Time: 2 hour**

Chapter: 1 to 4

Q.1 (A) For every subquestion 4 alternative answers are given. Choose the correct answer and write the alphabet of it : **(4)**

1)

M∪N = {1, 2, 3, 4, 5, 6} and M = (1, 2, 4} then which of the following represent set N?

a. {1, 2, 3} b. {3, 4, 5, 6} c. {2, 5, 6} d. {4, 5, 6}

2) If x, 12, 8, 32 are in proportion, then the value of x is

a. 6 b. 4 c. 3 d. 2

3)

Two rational numbers $\frac{a}{b}$ and $\frac{c}{d}$ are equal if and only if.

a. $ad > bc$ b. ad = bc c. $ad < bc$ d. None of these

4)

$p(x) = x^2 - 7\sqrt{7}x + 3$ then $p(7\sqrt{7}) = ?$

a. 3 b. $7\sqrt{7}$ c. $42\sqrt{7} + 3$ d. $49\sqrt{7}$

(B) Solve the following subquestions. **(4)**

1) Classify the following polynomial as linear, quadratic and cubic polynomial.

i. $m^3 + 7m^2 + \frac{5}{2}m - \sqrt{7}$

ii. 5p

2)

Compare the following pair of surds : $2\sqrt{7}, \sqrt{28}$

3)

If A = {1, 2, 3} and B = {1, 2, 3, 4} then $A \neq B$ verify it.

4)

Convert the following ratios into percentage : $\frac{7}{16}$

= _____

= $\frac{700}{16}$

= _____

Q.2 (A) Complete and write any two activities from the following : (4)

1)

5m - n = 3m + 4n then find the values of the following expressions : $\frac{m^2+n^2}{m^2-n^2}$

Solution:

5m - n = 3m + 4n

$\therefore$ 2m = 5n

$\therefore$ $\frac{m}{n}$ = _____

$\therefore$ $\frac{m^2}{n^2} = \frac{25}{4}$

Using _____

$\therefore$ $\frac{m^2+n^2}{m^2-n^2}$ = _____

$\therefore$ $\frac{m^2+n^2}{m^2-n^2}$ = _____

2) Factorize : $6x^2 - 5x - 6$

$6x^2 - 5x - 6$

= _____

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

= _____

3)

A = {x | x = 2n, n $\in$ N, 0 < x $\leq$ 10}, B = {y | y is an even number, 1 $\leq$ y $\leq$ 10}, Are A and B equal sets?

A = {_____}

B = {_____}

$\therefore$ A and B are equal sets.

(B) Solve any four subquestions from the following : (8)

1) Rationalise the denominator of the following:

i. $\frac{1}{\sqrt{7}-\sqrt{6}}$

ii. $\frac{\sqrt{2}+\sqrt{3}}{\sqrt{2}-\sqrt{3}}$

2)

Compare the surds : $8\sqrt{3}$, $\sqrt{192}$

3) Classify the following sets as 'singleton' or 'empty'

i. A = {x|x is a negative natural number}

ii. B = {y|y is an odd prime number y < 4}

4) By using factor theorem in the following examples, determine whether q(x)is a factor p(x) or not

$p(x) = 2x^3 - x^2 - 45$, $q(x) = x - 3$

5) If a, b, c are in continued proportion, prove that :

$\frac{a+b}{b+c} = \frac{a^2(b-c)}{b^2(a-b)}$

Q.3 (A) Complete and write any one activity from the following : (3)

1)

Solve the following equations : $\frac{\sqrt{4x+1}+\sqrt{x+3}}{\sqrt{4x+1}-\sqrt{x+3}} = \frac{4}{1}$

$\frac{\sqrt{4x+1}+\sqrt{x+3}}{\sqrt{4x+1}-\sqrt{x+3}} = \frac{4}{1}$

Using _____

$\therefore$ _____

$\therefore$ $\frac{2\sqrt{4x+1}}{2\sqrt{x+3}} = \frac{5}{3}$

$\therefore$ _____

Taking square on both sides

$\therefore$ $\frac{4x+1}{x+3} = \frac{25}{9}$

∴ _____

∴ _____

∴ x = _____

2)

Write the following rational numbers in $\frac{p}{q}$ form : 0.6

Let x = 0.666 ... =_____

∴ _____= 6.6

∴ 10x - x = _____

∴ 9x = _____

x = $\frac{6}{9}$ = _____

∴ 0.6 = _____

(B) Attempt any two subquestions from the following : **(6)**

1) Factorise: $(x^2 - 2x)^2 - 23(x^2 - 2x) + 120$

2) A = {1, 3, 9, 11, 13} B = {1, 9, 11}

Prove that A ∩ B = B using Venn diagram

3)

Prove that $3 + \sqrt{5}$ is an irrational number.

4) The k-method is used to solve examples based on equal ratios, i.e. equal proportions.
In this simple method every equal ratio is assumed to be equal to k.

If $\frac{a}{b} = \frac{c}{d}$ then show that $\frac{5a-3c}{5b-3d} = \frac{7a-2c}{7b-2d}$.

Q.4 Attempt any two subquestions from the following : **(8)**

1)

Solve: $\frac{12x^2+18x+42}{18x^2+12x+58} = \frac{2x+3}{3x+2}$

2)

If x - 2 and x - $\frac{1}{2}$ both the factor of the polynomial nx^2 - 5x + m, then show that m = n = 2

3)

Represent the number $\sqrt{10}$ on a number line.

Q.5 Attempt any one subquestions from the following : (3)

1) If 3x + 4y = 5x - 2y then find the value of following.

Find $\frac{x+y}{x-y}$ $\leftarrow \boxed{3x + 4y = 5x - 2y} \rightarrow$ Find $\frac{x}{y}$

$\downarrow$

Find $\frac{x^2+y^2}{x^2-y^2}$

2) In each of the following cases divided the first polynomial by the second polynomial and express as Dividend = Divisor $\times$ quotient + Remainder. y^3 - 64 ; y - 4