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Assignment-3 class - IX
sub - mathematics
chapter - Real numbers

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Very short Answer Type Questions

Que 1 Write the simplest rationalising factor (R.F.) for each of the following.

- (i) $5\sqrt{2}$ (ii) $2\sqrt{2}$ (iii) $\sqrt{7}$ (iv) $\sqrt{15}$

Que 2 Rationalise the denominator in each of the following:

(i) $\frac{5}{\sqrt{3}-\sqrt{5}}$ (ii) $\frac{6}{3\sqrt{2}-2\sqrt{3}}$ (iii) $\frac{2\sqrt{6}-\sqrt{5}}{3\sqrt{5}-2\sqrt{6}}$

(iv) $\frac{1+\sqrt{2}}{\sqrt{5}+\sqrt{3}}$

Que 3 Simplify the following:

(i) $\frac{3}{5-\sqrt{3}} + \frac{2}{5+\sqrt{3}}$ (ii) $\frac{\sqrt{5}-2}{\sqrt{5}+2} - \frac{\sqrt{5}+2}{\sqrt{5}-2}$

(iii) $\frac{1+\sqrt{2}}{\sqrt{5}+\sqrt{3}} + \frac{1-\sqrt{2}}{\sqrt{5}-\sqrt{3}}$ (iv) $\frac{\sqrt{7}-\sqrt{5}}{\sqrt{2}+\sqrt{5}} + \sqrt{35}$

Que 4 Short Answer Type Questions

(i) If $a = 3 + \sqrt{8}$ find the value of $a^2 + \frac{1}{a^2}$

Que 5) If $a = \frac{\sqrt{2}+1}{\sqrt{2}-1}$ $b = \frac{\sqrt{2}-1}{\sqrt{2}+1}$

Prove that $a^2 + ab + b^2 = 35$

Que 6) Problems based on binomial surds

If a and b be two rational numbers, find the values of a and b in the following Equations:

(a) $\frac{4+2\sqrt{5}}{4-3\sqrt{5}} = a+b\sqrt{5}$

(b) $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} = a+b\sqrt{15}$

(c) $\frac{\sqrt{5}-1}{\sqrt{5}+1} + \frac{\sqrt{5}+1}{\sqrt{5}-1} = a+b\sqrt{5}$

Que 7) Simplify

(i) $2^{\frac{2}{3}} \cdot 2^{\frac{1}{3}}$ (ii) $13^{\frac{1}{5}} \cdot 12^{\frac{1}{5}}$ (iii) $\frac{2^{\frac{1}{5}}}{2^{\frac{1}{3}}}$

Que 8) Simplify: (i) $\sqrt[3]{18} \times \sqrt[3]{15}$

(ii) $\sqrt{2} \cdot \sqrt[3]{3} \cdot \sqrt[4]{4}$

(iii) $\sqrt{3} \cdot \sqrt[3]{4} \cdot \sqrt[4]{5}$

Ques 9) If $\sqrt{2} = 1.414$, $\sqrt{3} = 1.732$

$\sqrt{5} = 2.236$, $\sqrt{10} = 3.162$

find the value of the following:

(a) $\frac{3}{\sqrt{10}}$

(b)

$\frac{2+\sqrt{3}}{3}$

(c) $\frac{\sqrt{10} + \sqrt{15}}{\sqrt{2}}$

Ques 10) Fill in the Blanks

i) Every point on the number line corresponds to a _____ number which may either be a _____ or _____ number.

ii) Quotient of a rational and Irrational number is a (an) _____ number.

iii) For every number there exists a _____ point on the number line.

iv) 0 is a _____ number.

v) only _____ numbers are rational numbers.

vi) If x and y be two irrational numbers then an irrational number _____ always lies between them.

Ques 11) Match the values of Column I with those in Column II

Column I	Column II
(A) $\sqrt[4]{(64)^{-2}} = \dots$	(P) $\frac{2}{9}$
(B) $\left(\frac{a}{b}\right)^{x-1} = \left(\frac{b}{a}\right)^{x-3}$ then $x = \dots$	(Q) $\frac{1}{8}$
(C) If $x = 4 + \sqrt{15}$ then $\left(\sqrt{x} - \frac{1}{\sqrt{x}}\right)$ $= \dots$	(R) 2
(D) $\left(\frac{81}{16}\right)^{\frac{-3}{4}} \times \left(\frac{64}{27}\right)^{\frac{-1}{3}}$ $= 9$	(S) $\sqrt{8}$

Ques 12) Mark whether the following statements are true (T) or false (F)

- (a) Between any two real numbers there is always another real number.
- (b) The Decimal form of an Irrational number is neither terminating nor repeating.
- (c) π cannot be represented on the number line.
- (d) Every non terminating decimal can be written as a periodic decimal.
- (e) There are many Irrational numbers between two rational numbers.