ADARSHA VIDYALAYA. HUNASHYAL, P.B

NAME :- **ROLL.NO:-** **Total Marks:- 20**

CLASS:–IX **UNIT TEST:-** Number System **SUBJECT:-** Mathematics

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Choose correct option in questions 1 to 5. **1X5=5**

1. The rational number not lying between $\frac{3}{5}$ and $\frac{2}{3}$ is

   a. $\frac{49}{75}$ **b.** $\frac{50}{75}$ **c.** $\frac{47}{75}$ **d.** $\frac{46}{75}$ ANS:- _____

2. The simplest form of $\sqrt{600}$ is

   a. $10\sqrt{60}$ **b.** $100\sqrt{6}$ **c.** $20\sqrt{3}$ **d.** $10\sqrt{6}$ ANS:- _____

3. A terminating decimal is

   a. a natural number **b. a rational number** **c. a whole number** **d. an integer.**
   ANS:- _____

4. The *p/q* form of the number 0.8 is

   a. $\frac{8}{10}$ **b.** $\frac{8}{100}$ **c.** $\frac{1}{8}$ **d.** $\frac{8}{1}$ ANS:- _____

5. $7.\overline{2}$ is equal to

   a. $\frac{68}{9}$ **b.** $\frac{64}{9}$ **c.** $\frac{65}{9}$ **d.** $\frac{63}{9}$ ANS:- _____

Answer the Following: **2X6=12**

6. Find four rational numbers between $\frac{3}{7}$ and $\frac{4}{7}$.

ANS:-

7. Multiply $\sqrt{3}$ by $\sqrt[3]{5}$

ANS:-

8. Represent $\sqrt{3}$ on number line

ANS:-

9. Simplify $(27)^{2/3} \div 9^{1/2}$ x $3^{3/2}$

ANS:-

10. Rationalize the denominator $\dfrac{1}{\sqrt{5+\sqrt{2}}}$ and subtract it from $\sqrt{5} - \sqrt{2}$

ANS:-

11. Show that $5\sqrt{2}$ is not rational number **or** Express $2.417\overline{8}$ in the form a/b.

ANS:-

Answer the Following: 1X3=3

12. Simplify $\dfrac{2+\sqrt{5}}{2-\sqrt{5}} + \dfrac{2-\sqrt{5}}{2+\sqrt{5}}$

ANS:-

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ANSWER PAPER

<u>CLASS</u>:–IX   <u>UNIT TEST</u>:- Number System   <u>SUBJECT</u>:- Mathematics

Choose correct option in questions 1 to 5.   1X5=5

1. The rational number not lying between $\frac{3}{5}$ and $\frac{2}{3}$ is

   a. $\frac{49}{75}$ **b.** $\frac{50}{75}$ **c.** $\frac{47}{75}$ **d.** $\frac{46}{75}$ ANS:- **b.** $\frac{50}{75}$

2. The simplest form of $\sqrt{600}$ is

   a. $10\sqrt{60}$ **b.** $100\sqrt{6}$ **c.** $20\sqrt{3}$ **d.** $10\sqrt{6}$ ANS:- **d.** $10\sqrt{6}$

3. A terminating decimal is

   a. a natural number   b. a rational number   c. a whole number   d. an integer.
   ANS:- b. a rational number

4. The *p/q* form of the number 0.8 is

   a. $\frac{8}{10}$ **b.** $\frac{8}{100}$ **c.** $\frac{1}{8}$ **d.** $\frac{8}{1}$ ANS:- **a.** $\frac{8}{10}$

5. $7.\bar{2}$ is equal to

   a. $\frac{68}{9}$ **b.** $\frac{64}{9}$ **c.** $\frac{65}{9}$ **d.** $\frac{63}{9}$ ANS:- _____

Answer the Following: 2X6=12

6. Find four rational numbers between $\frac{3}{7}$ and $\frac{4}{7}$.

ANS:- $\frac{3 X 10}{7 X 10}$ and $\frac{4 X 10}{7 X 10}$ Take any four rational numbers between 30 /70 and 40/70

   i.e. rational numbers between $\frac{3}{7}$ and $\frac{4}{7}$. are $\frac{31}{70}$, $\frac{32}{70}$, $\frac{33}{70}$, $\frac{34}{70}$.

7. Multiply $\sqrt{3}$ by $\sqrt[3]{5}$

   $\sqrt{3}$ and $\sqrt[3]{5}$

   Or $3^{\frac{1}{2}}$ and $5^{\frac{1}{3}}$ $5^{\frac{1}{3}} = 5^{\frac{1}{3} \cdot \frac{2}{2}} = \left(5^2\right)^{\frac{1}{6}} = (25)^{\frac{1}{6}}$

   LCM of 2 and 3 id 6 $\sqrt{3} \times \sqrt[3]{5} = (27)^{\frac{1}{6}} \times (25)^{\frac{1}{6}} = (27 \times 25)^{\frac{1}{6}}$

   $3^{\frac{1}{2}} = 3^{\frac{1}{2} \times \frac{3}{3}} = \left(3^3\right)^{\frac{1}{6}} = (27)^{\frac{1}{6}}$

ANS:- $= 675^{\frac{1}{6}} = \sqrt[6]{675}$

8. Represent $\sqrt{3}$ on number line
ANS:-

9. Simplify $(27)^{2/3} \div 9^{1/2} \times 3^{3/2}$

$$\frac{(27)^{-\frac{2}{3}}+9^{\frac{1}{2}}3^{\frac{3}{2}}}{}$$

$$\frac{(3\times3\times3)^{-\frac{2}{3}}\times3^{\frac{3}{2}}}{(3\times3)^{\frac{1}{2}}}$$

$$= \frac{(3^3)^{-\frac{2}{3}}\times3^{\frac{3}{2}}}{(3^2)^{\frac{1}{2}}}$$
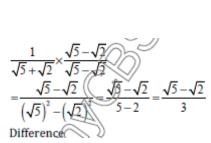
$$= \frac{3^{\frac{3}{2}-2}}{3} = \frac{3^{\frac{1}{3}}}{3} = \frac{1}{3^{1+\frac{1}{3}}}$$

$$= \frac{1}{3^{\frac{4}{3}}} = \frac{1}{\sqrt[3]{81}}$$

ANS:-

10. Rationalize the denominator $\frac{1}{\sqrt{5}+\sqrt{2}}$ and subtract it from $\sqrt{5}-\sqrt{2}$

ANS:-

$$\frac{1}{\sqrt{5}+\sqrt{2}}\times\frac{\sqrt{5}-\sqrt{2}}{\sqrt{5}-\sqrt{2}}$$

$$= \frac{\sqrt{5}-\sqrt{2}}{(\sqrt{5})^2-(\sqrt{2})^2} = \frac{\sqrt{5}-\sqrt{2}}{5-2} = \frac{\sqrt{5}-\sqrt{2}}{3}$$

Difference

$$= \sqrt{5}-\sqrt{2}-\left(\frac{\sqrt{5}-\sqrt{2}}{3}\right)$$

$$= \sqrt{5}-\sqrt{2}-\frac{\sqrt{5}}{3}+\frac{\sqrt{2}}{3}$$

$$= \left(\sqrt{5}-\frac{\sqrt{5}}{3}\right)-\left(\sqrt{2}-\frac{\sqrt{2}}{3}\right)$$

$$= \frac{2\sqrt{5}}{3}-\frac{2\sqrt{2}}{3} = \frac{2}{3}(\sqrt{5}-\sqrt{2})$$

11. Show that $5\sqrt{2}$ is not rational number **or** Express $2.417\overline{8}$ in the form a/b.

ANS:-

Let $5\sqrt{2}$ is rational no
$x = 5\sqrt{2}$ (x is rational)
x is rational no.
5 is rational no.
$\therefore x/5$ is rational no.
But $x/5 = \sqrt{2}$ and $\sqrt{2}$ is irrational no.
Which is a contradiction
$\therefore 5\sqrt{2}$ is irrational number

$x = 2.4\overline{178}$
$10x = 24.\overline{178}$____(1)
$10x = 24.178178178...$
$1000\times10x = 1000\times24.178178178....$
$10,000x = 24178.178178....$
$10000x = 24178.\overline{178}$ _____(2) if Eq (2) – eq(1)
$10,000x - x = 24178.\overline{178} - 24.\overline{178}$ }= $9990x = 24154$
$x = \textbf{24154 / 9990 = 2.4}\overline{\textbf{178}}$ or $=\textbf{12077/4995}$

Answer the Following: **1X3=3**

12. Simplify $\frac{2+\sqrt{5}}{2-\sqrt{5}} + \frac{2-\sqrt{5}}{2+\sqrt{5}}$

ANS:-