

QB365

Important Questions - Number Systems

9th Standard CBSE

Mathematics

Reg.No. :

--	--	--	--	--	--

Time : 01:00:00 Hrs

Total Marks : 50

**Section-A**

- 1) Which of the following is a rational number? 1  
(a)  $1 + \sqrt{3}$  (b)  $\pi$  (c)  $2\sqrt{3}$  (d) 0
- 2) A rational number lying between  $\sqrt{2}$  and  $\sqrt{3}$  is: 1  
(a)  $\frac{\sqrt{2}+\sqrt{3}}{2}$  (b)  $\sqrt{6}$  (c) 1.6 (d) 1.9
- 3) Two rational numbers between  $\frac{2}{3}$  and  $\frac{5}{3}$  are: 1  
(a)  $\frac{1}{6}$  and  $\frac{2}{6}$  (b)  $\frac{1}{2}$  and  $\frac{2}{7}$  (c)  $\frac{5}{6}$  and  $\frac{7}{6}$  (d)  $\frac{2}{3}$  and  $\frac{4}{3}$
- 4) Which of the following is a rational number? 1  
(a)  $\sqrt{5}$  (b)  $\pi$  (c) 0.101 001 0001 00001... (d) 0.853 853 853....
- 5) Which one of the following is an irrational number? 1  
(a) 0.14 (b)  $0.\overline{1416}$  (c)  $0.\overline{1416}$  (d) 0.401 4001 40001 4...
- 6)  $(\sqrt{a} + \sqrt{b})(\sqrt{a} - \sqrt{b})$  is: 1  
(a) a+b (b) a-b (c)  $2\sqrt{a}$  (d)  $2\sqrt{b}$
- 7) Which of the following numbers is an irrational number? 1  
(a)  $\sqrt{16} - 4$  (b)  $(3 - \sqrt{3})(3 + \sqrt{3})$  (c)  $\sqrt{5} + 3$  (d)  $-\sqrt{25}$
- 8) The value of  $\frac{2^0+7^0}{5^0}$  is: 1  
(a) 2 (b) 0 (c)  $\frac{9}{5}$  (d)  $\frac{1}{5}$
- 9) The value of  $\sqrt[4]{(64)^{-2}}$  is 1  
(a)  $\frac{1}{8}$  (b)  $\frac{1}{2}$  (c) 8 (d)  $\frac{1}{64}$
- 10) Value of  $\left[ \left( 81^{-1/2} \right)^{-1/4} \right]^2$  is: 1  
(a) 3 (b)  $\frac{1}{3}$  (c) 9 (d)  $\frac{1}{9}$

**Section-B**

- 11) Find two rational numbers between 0.1 and 0.2. 2
- 12) Check whether  $7\sqrt{5}$ ,  $\frac{7}{\sqrt{5}} \cdot \sqrt{2} + 21$ ,  $\pi - 5$  are irrational numbers or not. 2
- 13) Divide  $8\sqrt{15}$  by  $2\sqrt{3}$  2
- 14) Simplify: 2  
(i)  $17^2 \cdot 17^5$
- 15) Simplify:  $\frac{23^{-10}}{23^7}$  2

- 16) Rationalize the denominator of  $\frac{1}{\sqrt{2}}$  2
- 17) If  $a = 5 + 2\sqrt{6}$  and  $b = \frac{1}{a}$  then what will be the value of  $a^2 + b^2$  and  $a^3 + b^3$  ? 2
- 18) Simplify:  $\left(\frac{15\frac{3}{4}}{9\frac{1}{4}}\right)^{-6}$  2
- 19) If  $(4)^{2x-1} - (16)^{x-1} = 384$ , then find the value of x. 2
- 20) Evaluate:  $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}$ , given that  $\sqrt{15} = 3.87$  2

**Section-C**

- 21) Find four rational numbers between  $\frac{1}{3}$  and  $\frac{4}{5}$  5
- 22)  $\frac{\sqrt{147}}{\sqrt{75}}$  is not a rational number as  $\sqrt{147}$  and  $\sqrt{75}$  are not rational. State whether it is true or false. Justify your answer. 5
- 23) Find the values of a and b if:  $\frac{7+3\sqrt{5}}{3+\sqrt{5}} - \frac{7-3\sqrt{5}}{3-\sqrt{5}} = a + \sqrt{5}b$  5
- 24) Simplify:  $\left(\frac{81}{16}\right)^{-\frac{3}{4}} \times \left(\frac{25}{9}\right)^{-\frac{3}{2}}$  5

\*\*\*\*\*

**Section-A**

- 1) (d) 0 1
- 2) (c) 1.6 1
- 3) (c) 5/6 and 7/6 1
- 4) (d) 0.853 853 853.... 1
- 5) (d) 0.401 4001 40001 4... 1
- 6) (c)  $2\sqrt{a}$  1
- 7) (a)  $\sqrt{16} - 4$  1
- 8) (a) 2 1
- 9) (a) 1/8 1
- 10) (a) 3 1

**Section-B**

- 11) 0.125, 0.15 2
- 12) All are irrational numbers. 2
- 13)  $4\sqrt{5}$  2
- 14)  $17^7$  2
- 15)  $23^{-17}$  2
- 16)  $\frac{\sqrt{2}}{2}$  2
- 17) 98, 970 2
- 18)  $\frac{27}{225}$  2
- 19)  $\frac{11}{4}$  2

20) 7.87

2

## Section-C

21)  $\frac{1}{3} = \frac{1 \times 5}{3 \times 5} = \frac{5}{15}$

5

$$\frac{4}{5} = \frac{4 \times 3}{5 \times 3} = \frac{12}{15}$$

$$5 < 6 < 7 < 8 < 9 < 12$$

$$\frac{5}{15} < \frac{6}{12} < \frac{7}{12} < \frac{8}{12} < \frac{9}{12} < \frac{12}{15}$$

$$\frac{1}{3} < \frac{1}{2} < \frac{7}{12} < \frac{2}{3} < \frac{3}{4} < \frac{4}{5}$$

Hence, four rational numbers between  $\frac{1}{3}$  and  $\frac{4}{5}$  can be taken as  $\frac{1}{2}$ ,  $\frac{7}{12}$ ,  $\frac{2}{3}$  and  $\frac{3}{4}$

22)

5

$$\frac{\sqrt{147}}{\sqrt{75}} = \frac{\sqrt{3 \times 7 \times 7}}{\sqrt{3 \times 5 \times 5}} = \frac{7\sqrt{3}}{5\sqrt{3}} = \frac{7}{5}$$

which is clearly a rational number.

Hence, the given statement is false. The reason is that 'if we divide two irrationals, the result may be rational or irrational'.

23)  $\frac{7+3\sqrt{5}}{3+\sqrt{5}} - \frac{7-3\sqrt{5}}{3-\sqrt{5}} = a + \sqrt{5}b$

5

$$\frac{(7+3\sqrt{5})(3-\sqrt{5})}{(3+\sqrt{5})(3-\sqrt{5})} - \frac{(7-3\sqrt{5})(3+\sqrt{5})}{(3-\sqrt{5})(3+\sqrt{5})}$$

$$= \frac{21-7\sqrt{5}+9\sqrt{5}-15}{9-5} - \frac{21+7\sqrt{5}+9\sqrt{5}-15}{9-5}$$

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

$$\frac{6+2\sqrt{5}}{4} - \frac{6-2\sqrt{5}}{4} = a + \sqrt{5}b$$

$$= \frac{(6+2\sqrt{5})-(6-2\sqrt{5})}{4} = a + \sqrt{5}b$$

$$\frac{4\sqrt{5}}{4} = a + \sqrt{5}b$$

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

$$a = 0, b = 1$$

24)  $\left(\frac{81}{16}\right)^{-\frac{3}{4}} \times \left(\frac{25}{9}\right)^{-\frac{3}{2}}$

5

$$= \left\{ \left(\frac{81}{16}\right)^4 \right\}^{-\frac{3}{4}} \times \left\{ \left(\frac{5}{3}\right)^2 \right\}^{-\frac{3}{2}}$$

$$= \left(\frac{3}{2}\right)^{4 \times \left(-\frac{3}{4}\right)} \times \left(\frac{5}{3}\right)^{2 \times \left(-\frac{3}{2}\right)}$$

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

$$= \left(\frac{5}{2}\right)^{-3} = \left(\frac{2}{5}\right)^{-3} = \frac{8}{125}$$