

IX Homework - 4 MCQs - NUMBER SYSTEMS

- 1) $\sqrt[4]{\sqrt[3]{2^2}} =$ (a) $2^{-\frac{1}{6}}$ (b) 2^{-6} (c) $2^{\frac{1}{6}}$ (d) 2^6
- 2) $\frac{3^{50} + 3^{49} - 9^{24}}{3^{40} + 3^{41} + 9^{23}} =$ (a) $\frac{99}{13}$ (b) $\frac{88}{13}$ (c) $\frac{77}{13}$ (d) $\frac{66}{13}$
- 3) The product $\sqrt[3]{2} \times \sqrt[4]{2} \times \sqrt[12]{32} =$ (a) $\sqrt{2}$ (b) 2 (c) $\sqrt[12]{2}$ (d) $\sqrt[12]{32}$
- 4) The value of $\sqrt[4]{(81)^{-2}} =$ (a) $\frac{1}{9}$ (b) $\frac{1}{3}$ (c) 9 (d) $\frac{1}{81}$
- 5) Which of the following is equal to x ?
 (a) $x^{\frac{12}{7}} - x^{\frac{5}{7}}$ (b) $\sqrt[12]{(x^4)^{\frac{1}{3}}}$ (c) $(\sqrt{x^3})^{\frac{2}{3}}$ (d) $x^{\frac{12}{7}} \times x^{\frac{7}{12}}$
- 6) $\frac{\sqrt{32} + \sqrt{48}}{\sqrt{8} + \sqrt{12}} =$ (a) $\sqrt{2}$ (b) 2 (c) 4 (d) 8
- 7) Value of $(256)^{0.16} \times (256)^{0.09} =$ (a) 4 (b) 16 (c) 64 (d) 256.25
- 8) $\left(\frac{3^a}{3^b}\right)^{a+b} \times \left(\frac{3^b}{3^c}\right)^{b+c} \times \left(\frac{3^c}{3^a}\right)^{c+a} =$ (a) 0 (b) 1 (c) 2 (d) $\frac{1}{2}$
- 9) If $64^{2x-5} = 4 \times 8^{x-5}$, then $x =$ (a) $\frac{13}{9}$ (b) $\frac{17}{9}$ (c) $\frac{13}{7}$ (d) $\frac{11}{9}$
- 10) If $(81)^{\frac{5}{x}} = 243$, then $x =$ (a) 2 (b) 3 (c) 4 (d) 5
- 11) $\sqrt[4]{(81)^{-2}} =$ (a) $\frac{1}{3}$ (b) $\frac{1}{5}$ (c) $\frac{1}{7}$ (d) $\frac{1}{9}$
- 12) $\sqrt[5]{\sqrt[4]{3^2}} =$ (a) 3^{10} (b) $\frac{1}{3^{-10}}$ (c) $3^{\frac{1}{10}}$ (d) 3^{-10}
- 13) $\frac{\sqrt{112} - \sqrt{80}}{\sqrt{20} - \sqrt{28}} =$ (a) $\sqrt{2}$ (b) 2 (c) 4 (d) -2
- 14) The value of $(81)^{0.16} \times (81)^{0.09} =$ (a) 9 (b) 3 (c) 81.25 (d) 27
- 15) $9^{\frac{1}{3}} \times 3^{\frac{1}{3}} =$ (a) $\frac{1}{3}$ (b) 27 (c) 3 (d) none of these

16) Value of $\left[9 \left(64^{\frac{1}{3}} + 125^{\frac{1}{3}}\right)\right]^{\frac{1}{4}} =$
 (a) 9 (b) 3 (c) 81 (d) $9 \cdot \sqrt[4]{9}$

17) $\frac{3}{\sqrt{8}} + \frac{1}{\sqrt{2}} =$ (a) $\frac{2\sqrt{3}}{3}$ (b) $\frac{5\sqrt{2}}{4}$ (c) $\frac{7\sqrt{2}}{4}$ (d) $\frac{9\sqrt{6}}{5}$

18) $\sqrt{45} - 3\sqrt{20} + 4\sqrt{5} =$ (a) $\sqrt{3}$ (b) $\sqrt{2}$ (c) $\sqrt{5}$ (d) $2\sqrt{5}$

19) $\left[\left[5 \left(8^{\frac{1}{3}} + 27^{\frac{1}{3}}\right)^3\right]^{\frac{1}{4}}\right]^{\frac{1}{2}} =$ (a) 6 (b) 5 (c) 4 (d) 3

20) $\sqrt[4]{81} + 8 \times \sqrt[3]{216} - 15 \times \sqrt[5]{32} - \sqrt{225} =$ (a) 5 (b) 3 (c) 2 (d) 6

21) $(625)^{-\frac{1}{4}} =$ (a) $\frac{1}{3}$ (b) $\frac{1}{5}$ (c) $\frac{1}{25}$ (d) $\frac{1}{50}$

22) If $5^{x+3} = 25$, then the value of $x =$ (a) -2 (b) -1 (c) 1 (d) 2

23) $4\sqrt{2} - 2\sqrt{8} + \frac{3}{\sqrt{2}} =$ (a) $\frac{3\sqrt{2}}{2}$ (b) $\frac{\sqrt{5}}{2}$ (c) $\frac{3\sqrt{3}}{2}$ (d) $\frac{5\sqrt{2}}{3}$

24) The value of $64^{-\frac{1}{3}} \left(64^{\frac{1}{3}} - 64^{\frac{2}{3}}\right) =$ (a) 1 (b) $\frac{1}{3}$ (c) -3 (d) -2

25) $(256)^{-\left(4^{\frac{3}{2}}\right)} =$ (a) 8 (b) $\frac{1}{8}$ (c) 2 (d) $\frac{1}{2}$

26) $\sqrt{a^{-1}b} \times \sqrt{b^{-1}c} \times \sqrt{c^{-1}a} =$ (a) 1 (b) abc (c) \sqrt{abc} (d) $\frac{1}{abc}$

27) $(x^{-1} + y^{-1})^{-1} =$ (a) xy (b) $x+y$ (c) $\frac{xy}{x+y}$ (d) $\frac{x+y}{xy}$

28) $\frac{5^{n+2} - 6 \times 5^{n+1}}{13 \times 5^n - 2 \times 5^{n+1}} =$ (a) $\frac{5}{3}$ (b) $-\frac{5}{3}$ (c) $\frac{3}{5}$ (d) $-\frac{3}{5}$

29) $\left[2 - 3(2-3)^3\right]^3 =$ (a) 5 (b) 125 (c) $\frac{1}{5}$ (d) -125

30) If $\left(\frac{2}{3}\right)^x \times \left(\frac{3}{2}\right)^{2x} = \frac{81}{16}$, then $x =$

(a) 2 (b) 3 (c) 4 (d) 1

IX Homework-4 (Answers)

1) $2^{2 \times \frac{1}{3} \times \frac{1}{4}} = 2^{\frac{2}{12}} = 2^{\frac{1}{6}}$ (c)

2) $\frac{3^{50} + 3^{49} - 3^{48}}{3^{48} + 3^{47} + 3^{46}} = \frac{3^{46} (3^4 + 3^3 - 3^2)}{3^{46} (3^2 + 3 + 1)} = \frac{81 + 27 - 9}{9 + 4 + 1} = \frac{99}{13}$ (a)

3) $2^{\frac{1}{3}} \times 2^{\frac{1}{4}} \times 2^{5 \times \frac{1}{12}} = 2^{\frac{1}{3} + \frac{1}{4} + \frac{5}{12}} = 2^{\frac{4+3+5}{12}} = 2^{\frac{12}{12}} = 2$ (b)

4) $81^{-\frac{2}{4}} = 81^{-\frac{1}{2}} = \frac{1}{81^{\frac{1}{2}}} = \frac{1}{\sqrt{81}} = \frac{1}{9}$ (a)

5) $\sqrt[12]{(x^4)^{\frac{1}{3}}} = x^{4 \times \frac{1}{3} \times \frac{1}{12}} = x^{\frac{4}{36}} = x^{\frac{1}{9}} \neq x$

$(\sqrt{x^3})^{\frac{2}{3}} = x^{3 \times \frac{2}{3} \times \frac{1}{2}} = x$ (c)

6) $\frac{4\sqrt{2} + 4\sqrt{3}}{2\sqrt{2} + 2\sqrt{3}} = \frac{4(\sqrt{2} + \sqrt{3})}{2(\sqrt{2} + \sqrt{3})} = \frac{4}{2} = 2$ (b)

$2 \overline{) 32}$	$2 \overline{) 48}$
$2 \overline{) 16}$	$2 \overline{) 24}$
$2 \overline{) 8}$	$2 \overline{) 12}$
$2 \overline{) 4}$	$2 \overline{) 6}$
2	3

7) $(256)^{0.16 + 0.09} = (256)^{0.25} = (256)^{\frac{1}{4}} = 4^{4 \times \frac{1}{4}} = 4$ (a)

8) $3^{(a-b)(a+b)} \times 3^{(b-c)(b+c)} \times 3^{(c+a)(c-a)}$ [$\frac{a^m}{a^n} = a^{m-n}$]
 $= 3^{a^2 - b^2} \times 3^{b^2 - c^2} \times 3^{c^2 - a^2}$ [$(a^m)^n = a^{mn}$]
 $= 3^{a^2 - b^2 + b^2 - c^2 + c^2 - a^2}$ [$a^m \cdot a^n = a^{m+n}$]

$= 3^0 = 1$

9) $2^{6(2x-5)} = 2^2 \times 2^{3(x-5)}$ ∴ $12x - 30 = 3x - 13$
 $2^{12x-30} = 2^2 \times 2^{3x-15}$ $9x = 17$
 $2^{12x-30} = 2^{2+3x-15}$ $x = \frac{17}{9}$ (b)

$$10) \quad 3^{4 \times \frac{5}{x}} = 3^5 \quad \left| \quad \therefore x = \frac{20}{5} = 4 \text{ (c)}\right.$$

$$\therefore \frac{20}{x} = 5$$

$$11) \quad 3^{4x - 2 \times \frac{1}{4}} = 3^{-2} = \frac{1}{3^2} = \frac{1}{9} \text{ (d)}$$

$$12) \quad 3^{2 \times \frac{1}{4} \times \frac{1}{5}} = 3^{\frac{2}{20}} = 3^{\frac{1}{10}} \text{ (c)}$$

$$13) \quad \frac{4\sqrt{7} - 4\sqrt{5}}{2\sqrt{5} - 2\sqrt{7}} = \frac{4(\sqrt{7} - \sqrt{5})}{2(\sqrt{5} - \sqrt{7})} = -2 \text{ (d)}$$

$$\begin{array}{r} 2 \overline{)112} \\ \underline{2 \ 56} \\ 2 \ 28 \\ \underline{2 \ 14} \\ 7 \end{array}$$

$$\begin{array}{r} 2 \overline{)80} \\ \underline{2 \ 40} \\ 2 \ 20 \\ \underline{2 \ 10} \\ 5 \end{array}$$

$$14) \quad 81^{0.16 + 0.09} = 81^{0.25} = 81^{\frac{1}{4}} = 3^{4 \times \frac{1}{4}} = 3 \text{ (b)}$$

$$15) \quad 3^{2 \times \frac{1}{3}} \times 3^{\frac{1}{3}} = 3^{\frac{2}{3} + \frac{1}{3}} = 3^{\frac{3}{3}} = 3 \text{ (c)}$$

$$16) \quad \left[9 \left(4^{3 \times \frac{1}{3}} + 5^{3 \times \frac{1}{3}} \right) \right]^{\frac{1}{4}} = \left[9(4+5) \right]^{\frac{1}{4}} = (9^2)^{\frac{1}{4}} = 9^{\frac{1}{2}} = \sqrt{9} = 3 \text{ (b)}$$

$$17) \quad \frac{3}{\sqrt{8}} + \frac{1}{\sqrt{2}} = \frac{3 \times \sqrt{2}}{2\sqrt{2} \times \sqrt{2}} + \frac{1 \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}}$$

$$18) \quad 3\sqrt{5} - 3 \times 2\sqrt{5} + 4\sqrt{5} = 3\sqrt{5} - 6\sqrt{5} + 4\sqrt{5} = 7\sqrt{5} - 6\sqrt{5} = \sqrt{5} \text{ (c)}$$

$$\begin{array}{r} 5 \overline{)45} \\ \underline{3 \ 9} \\ 3 \end{array}$$

$$\begin{array}{r} 2 \overline{)20} \\ \underline{2 \ 10} \\ 10 \end{array}$$

$$19) \quad \left[\left[5 \left(2^{3 \times \frac{1}{3}} + 3^{3 \times \frac{1}{3}} \right)^3 \right]^{\frac{1}{4}} \right]^2 = \left[5(2+3)^3 \right]^{\frac{1}{4} \times 2 \times \frac{1}{2}} = (5 \times 5^3)^{\frac{2}{8} \times 4} = 5^{4 \times \frac{1}{4}} = 5 \text{ (b)}$$

$$20) \quad 3^{4 \times \frac{1}{4}} + 8 \times 6^{3 \times \frac{1}{3}} - 15 \times 2^{5 \times \frac{1}{5}} - 15$$

$$= 3 + 8 \times 6 - 15 \times 2 - 15$$

$$= 3 + 48 - 30 - 15 = 6 \text{ (d)}$$

$$21) 5^{4x-\frac{1}{4}} = 5^{-1} = \frac{1}{5} \quad (b)$$

$$22) 5^{x+3} = 5^2$$

$$\therefore x+3=2$$

$$x = -1 \quad (b)$$

$$23) 4\sqrt{2} - 2 \times 2\sqrt{2} + \frac{3}{\sqrt{2}} = \frac{4 \times 2 - 4 \times 2 + 3}{\sqrt{2}} = \frac{8-8+3}{\sqrt{2}} = \frac{3 \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} = \frac{3\sqrt{2}}{2} \quad (a)$$

$$24) 64^{-\frac{1}{3}} (64^{\frac{1}{3}} - 64^{\frac{2}{3}})$$

$$= 4^{3 \times -\frac{1}{3}} (4^{3 \times \frac{1}{3}} - 4^{3 \times \frac{2}{3}}) = 4^{-1} (4 - 4^2) = 4^{-1} (4 - 16) = \frac{-12}{4} = -3 \quad (c)$$

$$25) (256)^{-(2^{\frac{3}{2}})} = (256)^{-(2^3)} = (256)^{-\frac{1}{2^3}} = 256^{-\frac{1}{8}} = 2^{8 \times -\frac{1}{8}} = 2^{-1} = \frac{1}{2} \quad (d)$$

$$26) \sqrt{\frac{b}{a}} \times \sqrt{\frac{c}{b}} \times \sqrt{\frac{a}{c}} = \sqrt{\frac{b}{a} \times \frac{c}{b} \times \frac{a}{c}} = \sqrt{1} = 1 \quad (a)$$

$$27) (x^{-1} + y^{-1})^{-1} = \left(\frac{1}{x} + \frac{1}{y}\right)^{-1} = \left(\frac{x+y}{xy}\right)^{-1} = \frac{xy}{x+y} \quad (c)$$

$$28) \frac{5^n \cdot 5^2 - 6 \times 5^n \cdot 5^1}{13 \times 5^n - 2 \times 5^n \cdot 5^1} = \frac{5^n (5^2 - 6 \times 5)}{5^n (13 - 2 \times 5)} = \frac{25 - 30}{13 - 10} = \frac{-5}{3} \quad (b)$$

$$29) [2 - 3(-1)^3]^3 = (2 - 3 \times (-1))^3 = (2 + 3)^3 = 5^3 = 125 \quad (b)$$

$$30) \left(\frac{2}{3}\right)^x \times \left(\frac{3}{2}\right)^{2x} = \left(\frac{3}{2}\right)^4$$

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

$$\Rightarrow \left(\frac{3}{2}\right)^{-x+2x} = \left(\frac{3}{2}\right)^4 \Rightarrow \left(\frac{3}{2}\right)^x = \left(\frac{3}{2}\right)^4$$

$$\therefore x = 4 \quad (c)$$