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Correct answers:

1	2	3	4	5	6	7	8	9	10
C	B	C	C	D	C	C	B	B	A

Explanations:

1). $\log_x 8 = 6/10 = 3/5$

$$8 = x^{3/5}$$

$$8^{5/3} = x$$

$$x = 2^5 = 32.$$

Hence, option C is correct.

2). We know that : $a^{\log_a x} = x$.

$$\begin{aligned} \therefore 36^{\log_6 4} &= (6^2)^{\log_6 4} = 6^{2 \log_6 4} \\ &= 6^{\log_6 (4^2)} = 6^{\log_6 (16)} = 16. \end{aligned}$$

Hence, option B is correct.

3). We know that $\log_a b = \frac{\log b}{\log a}$.

$$\begin{aligned} \therefore \log_3 5 \cdot \log_{25} 27 &= \frac{\log 5}{\log 3} \times \frac{\log 27}{\log 25} = \frac{\log 5}{\log 3} \times \frac{\log 3^3}{\log 5^2} \\ &= \frac{\log 5}{\log 3} \times \frac{3 \log 3}{2 \log 5} = \frac{3}{2}. \end{aligned}$$

Hence, option C is correct.

4). $\log_9 27 = m \Leftrightarrow 9^m = 27 \Leftrightarrow 3^{2m} = 3^3 \Leftrightarrow 2m = 3 = 3/2$.

$$\Rightarrow m = 3/2$$

$$\text{And, } \log_{27} 9 = n \Leftrightarrow (27)^n = 9 \Leftrightarrow 3^{3n} = 3^2 \Leftrightarrow 3n = 2$$

$$\Rightarrow n = \frac{2}{3}$$

$$\therefore \log_9 27 - \log_{27} 9 = 3/2 - 2/3 = (9-4)/6$$

$$\Rightarrow 5/6.$$

Hence option C is correct.

5). $[\log_{10} (5 \log_{10} 100)]^2 = [\log_{10} (5 \log_{10} 10^2)]^2$

$$= [\log_{10} (10 \log_{10} 10)]^2$$

$$= [\log_{10} 10]^2 \quad (\because \log_{10} 10 = 1)$$

$$= 1^2 = 1.$$

Hence, option D is correct.

6). $\frac{1}{2} \log_{10} 25 - 2 \log_{10} 3 + \log_{10} 18$

$$= \log_{10} 25^{1/2} - \log_{10} 3^2 + \log_{10} 18$$

$$= \log_{10} 5 - \log_{10} 9 + \log_{10} 18$$

$$= \log_{10} \frac{5 \times 18}{9} = \log_{10} \frac{90}{9} = \log_{10} 10 = 1$$

Hence, option C is correct.

7). Let $\log_{10} 0.0001 = x$

$$\Rightarrow x = \log_{10} (10)^{-4}$$

$$\Rightarrow \log_{10} 1 - \log_{10} (10)^4 = 0 - 4 = -4.$$

Hence, option C is correct.

$$8). \frac{[\log_{13} (10)]}{\log_{169} (10)} = \frac{\log_{13} (10)}{\log_{13^2} (10)} \quad (\because \log_{a^b} (C) = \frac{1}{b} \log_a C)$$

$$= \frac{\log_{13} 10}{2 \log_{13} 10}$$

$$= \frac{1}{2} = \frac{1}{2}$$

Hence, option B is correct.

$$9). \log_{100} 0.1 = \log_{100} \frac{1}{10}$$

$$= \log_{100} 1 - \log_{100} 10$$

$$= 0 - \frac{1}{2} \log_{10} 10 = -\frac{1}{2} \times 1 = -\frac{1}{2}.$$

Hence, option B is correct.

$$10). = 2 \log \left(\frac{5}{8}\right) + \log\left(\frac{128}{125}\right) + \log\left(\frac{5}{2}\right)$$

$$= \log\left(\frac{5}{8}\right)^2 + \log\left(\frac{128}{125}\right) + \log\left(\frac{5}{2}\right)$$

$$= \log\left(\frac{5^2 \times 128 \times 5}{8^2 \times 125 \times 2}\right) = \log\left(\frac{5^2 \times 2^7 \times 5}{(2^3)^2 \times 5^3 \times 2}\right)$$

$$= \log\left(\frac{2^7 \times 5^3}{2^6 \times 5^3 \times 2}\right)^2 = \log\left(\frac{2^7 \times 5^3}{2^7 \times 5^3}\right)$$

$$= \log 1 = 0.$$

Hence, option A is correct.



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