Chapter 01

Basic Maths and Logarithm

Practice Section-01

Q.1 If $a^x = bc, b^y = ca, c^z = ab$, then $xyz =$

(1) 0 (2) 1 (3) $x+y+z$ (4) $x+y+z+2$

Q.2 If $x^y = y^x$, then $(x/y)^{(x/y)} = x^{(x/y)-k}$, where $k =$

(1) 0 (2) 1 (3) –1 (4) None of these

Q.3 If $x = 2^{1/3} - 2^{-1/3}$, then $2x^3 + 6x =$

(1) 1 (2) 2 (3) 3 (4) None of these

Q.4 Solution of the equation $4.9^{x-1} = 3\sqrt{(2^{2x+1})}$ has the solution

(1) 3 (2) 2 (3) 3/2 (4) 2/3

Q.5 $\dfrac{4}{1+\sqrt{2}-\sqrt{3}} =$

(1) $3+\sqrt{2}+\sqrt{3}$ (2) $1+\sqrt{2}+\sqrt{3}$ (3) $2+\sqrt{2}+\sqrt{6}$ (4) None of these

Q.6 If $\dfrac{a}{b} = \dfrac{2}{3}$ and $\dfrac{b}{c} = \dfrac{4}{5}$, then value of $\dfrac{a+b}{b+c}$

(1) $\dfrac{19}{27}$ (2) $\dfrac{20}{27}$ (3) $\dfrac{20}{19}$ (4) $\dfrac{27}{20}$

Q.7 $\left(\dfrac{1}{3}\right)^{-10}.27^{-3} + \left(\dfrac{1}{5}\right)^{-4}.(25)^{-2} + \left(64^{-\frac{1}{9}}\right)^{-3} =$

(1) 3 (2) 5 (3) 7 (4) 8

Q.8 Evaluate $\sqrt{3+\sqrt{3}+\sqrt{2+\sqrt{3}+\sqrt{7+\sqrt{48}}}}$

(1) $\sqrt{3}+1$ (2) $\sqrt{2}-1$ (3) $\sqrt{3}-1$ (4) None of these

Practice Section-02

Q.1 Solution of the equation $9^x - 2^{x+\frac{1}{2}} = 2^{x+\frac{3}{2}} - 3^{2x-1}$

(1) $\log_9(9/\sqrt{8})$ (2) $\log_{(9/2)}(9/\sqrt{8})$ (3) $\log_e(9/\sqrt{8})$ (4) None of these

Q.2 If $a^4 \cdot b^5 = 1$ then the value of $\log_a(a^5b^4)$ equals

(1) 9/5 (2) 4 (3) 5 (4) 8/5

Q.3 If $\log_a(ab) = x$, then $\log_b(ab)$ is equal to

(1) $\frac{1}{x}$ (2) $\frac{x}{1+x}$ (3) $\frac{x}{1-x}$ (4) $\frac{x}{x-1}$

Q.4 $(\log_2 10) \cdot (\log_2 80) - (\log_2 5) \cdot (\log_2 160)$ is equal to :

(1) $\log_2 5$ (2) $\log_2 20$ (3) $\log_2 10$ (4) $\log_2 16$

Q.5 Which one of the following is the smallest?

(1) $\log_{10}\pi$ (2) $\sqrt{\log_{10}\pi^2}$ (3) $\left(\frac{1}{\log_{10}\pi}\right)^3$ (4) $\left(\frac{1}{\log_{10}\sqrt{\pi}}\right)$

Q.6 $\log_{10}(\log_2 3) + \log_{10}(\log_3 4) + \log_{10}(\log_4 5) + \ldots\ldots + \log_{10}(\log_{1023} 1024)$ simplifies to

(1) a composite number (2) a prime number

(3) rational number which is not an integer (4) an integer number

Q.7 If $\log_x \log_{18}\left(\sqrt{2}+\sqrt{8}\right) = \frac{1}{3}$. Then the value of 1000 x is equal to

(1) 8 (2) 1/8 (3) 1/125 (4) 125

Q.8 Sum of all solutions of equation $\log_2(\log_3(x^2-1)) = 0$ is

(1) 4 (2) – 4 (3) 0 (4) 2

Q.9 If $\log_2(\log_9 x + \frac{3}{2} + 8^x) = 3x$, then value of 27x is equal to

(1) $\frac{1}{27}$ (2) 27 (3) 1 (4) $\frac{1}{9}$

Q.10 If x = 1998!, then value of the expression $\frac{1}{\log_2 x} + \frac{1}{\log_3 x} + \ldots\ldots + \frac{1}{\log_{1998} x}$ equals-

(1) –1 (2) 0 (3) 1 (4) 198

Q.11 $\log_2 72 + \log_2\left(\frac{32}{81}\right) + \log_2\left(\frac{9}{64}\right) =$

(1) 1 (2) 2 (3) –2 (4) 0

Q.12 Find the value of $\log \cot 1° + \log \cot 2° + \log \cot 3° + \ldots + \log \cot 89°$

(1) 0 (2) 1 (3) 3 (4) 3

Practice Section-03

Q.1 Solve the inequality, $\frac{2x-1}{3} \geq \frac{3x-2}{4} - \frac{2-x}{5}$

(1) $(-\infty, 2)$ (2) $(-\infty, 2]$

(3) $(-3, \infty)$ (4) None of these

Q.2 The set of all x satisfying the inequality $\frac{4x-1}{3x+1} \geq 1$ is

(1) $\left(-\infty, -\frac{1}{3}\right) \cup \left[\frac{1}{2}, \infty\right)$ (2) $\left(-\infty, -\frac{2}{3}\right) \cup \left[\frac{5}{4}, \infty\right)$

(3) $\left(-\infty, -\frac{1}{3}\right) \cup [2, \infty)$ (4) $\left(-\infty, -\frac{1}{3}\right) \cup [4, \infty)$

Q.3 The solution set of $\frac{x^2-3x+4}{x+1} > 1, x \in R$, is

(1) $(3, \infty)$ (2) $(-1, 1) \cup (3, \infty)$ (3) $[-1, 1] \cup [3, \infty)$ (4) none of these

Q.4 Solution of $|3-x| \geq x-3$ is

(1) $x < 3$ (2) $x > 3$ (3) $x \in R$ (4) $x \leq 3$

Q.5 Solution of $\sqrt{x-5} \geq 2$ is

(1) $[9, \infty)$ (2) $(7, \infty)$ (3) $[5, \infty)$ (4) $[2, \infty)$

Q.6 Solution set of the inequality $2 - \log_2(x^2 + 3x) \geq 0$ is :

(1) $[-4, 1]$ (2) $[-4, -3) \cup (0, 1]$

(3) $(-\infty, -3) \cup (1, \infty)$ (4) $(-\infty, -4) \cup [1, \infty)$

Q.7 The set of all solutions of the inequality $\left(\frac{1}{2}\right)^{x^2-2x} < \frac{1}{8}$ contains the set

(1) $(-\infty, 0)$ (2) $(-\infty, 1)$ (3) $(1, \infty)$ (4) $(4, \infty)$

Q.8 Solution set of inequality $\log_3 \frac{5x+3}{7-2x} \geq 0$ is

(1) $\left[-\frac{4}{7}, \frac{7}{2}\right)$ (2) $\left[\frac{4}{7}, \frac{7}{2}\right)$ (3) $\left(-\frac{3}{5}, \frac{7}{2}\right)$ (4) $\left(-\infty, \frac{4}{7}\right] \cup \left(\frac{7}{2}, \infty\right)$

Q.9 The number of real values of the parameter k for which $(\log_{16} x)^2 - \log_{16} x + \log_{16} k = 0$ with real coefficients will have exactly one solution is

(1) 2 (2) 1

(3) 4 (4) None of these

Q.10 If $x = \log_5(1000)$ and $y = \log_7(2058)$ then

(1) $x > y$ (2) $x < y$

(3) $x = y$ (4) None of these

Q.11 If $\frac{1}{\log_3 \pi} + \frac{1}{\log_4 \pi} > x$, then max. value of x will be

(1) 2 (2) 3 (3) 3.5 (4) π

Q.12 Solution of the inequality $\log_{\frac{1}{3}}(5x - 1) > 0$ will be

(1) $\left[-\frac{1}{5}, \frac{2}{5}\right)$ (2) $\left[\frac{1}{5}, \frac{2}{5}\right)$ (3) $\left(\frac{1}{5}, \frac{2}{5}\right)$ (4) None of these

ANSWER KEY

PRACTICE SECTION-01

Qus.	1	2	3	4	5	6	7	8
Ans.	4	2	3	3	3	2	4	1

PRACTICE SECTION-02

Qus.	1	2	3	4	5	6	7	8	9	10	11	12
Ans.	2	1	4	4	1	4	4	3	3	3	2	1

PRACTICE SECTION-03

Qus.	1	2	3	4	5	6	7	8	9	10	11	12
Ans.	2	3	2	3	1	2	4	2	2	1	1	3