

MATHEMATICS (ASSIGNMENT-2)

TOPIC- LIMITS

- Q.1 If $f(x) = \begin{cases} 2, & x > 4 \\ 0, & x \leq 4 \end{cases}$, then $\lim_{x \rightarrow 4} f(x)$ equals-
- (1) 0 (2) 2 (3) Does not exist (4) None of these
- Q.2 $\lim_{x \rightarrow 0} x \sin \frac{1}{x}$ equals-
- (1) 1 (2) 0 (3) ∞ (4) None of these
- Q.3 Which of the following limit exists?
- (1) $\lim_{x \rightarrow 0} \left(\frac{1}{x} \right)$ (2) $\lim_{x \rightarrow 0} \left(\frac{1}{x^2} \right)$ (3) $\lim_{x \rightarrow 0} (2^{1/x})$ (4) $\lim_{x \rightarrow \pi/2} (\tan x)$
- Q.4 $\lim_{x \rightarrow 0} \frac{e^{1/x}}{x}$ equals-
- (1) 0 (2) 1 (3) ∞ (4) Does not exist
- Q.5 Which of the following limits exists-
- (1) $\lim_{x \rightarrow 0} x |x|$ (2) $\lim_{x \rightarrow 1/4} [x]$ (3) $\lim_{x \rightarrow 0} x \sin 1/x$ (4) All the above
- Q.6 $\lim_{x \rightarrow 0} \frac{\sin x}{|x|}$ equals-
- (1) 1 (2) 0 (3) -1 (4) Does not exist
- Q.7 $\lim_{x \rightarrow 0} e^{1/x}$ equals-
- (1) ∞ (2) 0 (3) $-\infty$ (4) None of these
- Q.8 The value of $\lim_{x \rightarrow \infty} \{x - \sqrt{x^2 + x}\}$ is-
- (1) 1/2 (2) -1/2 (3) 1 (4) -1
- Q.9 $\lim_{n \rightarrow \infty} \frac{n^2 + n + 1}{1 + 3 + 5 + \dots + (2n - 1)}$ equals-
- (1) 1 (2) 4/3 (3) 3/4 (4) ∞
- Q.10 The value of $\lim_{x \rightarrow \infty} \frac{2x^3 - 4x + 7}{3x^3 + 5x^2 - 4}$ is-
- (1) 2/3 (2) -7/4 (3) -4/5 (4) ∞
- Q.11 The value of $\lim_{n \rightarrow \infty} \frac{\sqrt{3n^2 - 1} - \sqrt{2n^2 - 1}}{4n + 3}$ is-
- (1) $\frac{1}{4} (\sqrt{3} - \sqrt{2})$ (2) $\frac{1}{4} (\sqrt{3} + \sqrt{2})$ (3) $(\sqrt{3} - \sqrt{2})$ (4) None of these

- Q.12 $\lim_{x \rightarrow \infty} \frac{(2x-3)(3x-4)}{(4x-5)(5x-6)} =$
 (1) 0 (2) 1/10 (3) 1/5 (4) 3/10
- Q.13 $\lim_{x \rightarrow \infty} a^x, 0 < a < 1$ is equal to-
 (1) 0 (2) 1 (3) ∞ (4) a
- Q.14 $\lim_{x \rightarrow \infty} \frac{\sin 5x}{x}$ equals-
 (1) 5 (2) 1/5 (3) 0 (4) 1
- Q.15 The value of $\lim_{n \rightarrow \infty} \frac{\frac{1}{2} + 1 + \frac{3}{2} + \dots + \frac{n}{2}}{25n^2 + n + 3}$ is-
 (1) 0 (2) 1/100 (3) ∞ (4) None of these
- Q.16 $\lim_{n \rightarrow \infty} \frac{(n+2)! + (n+3)!}{(n+4)!}$ equals-
 (1) 0 (2) ∞ (3) 1 (4) None of these
- Q.17 $\lim_{x \rightarrow 2} \frac{x^2 - 3x + 2}{x^2 + x - 6}$ equals-
 (1) 1/5 (2) 2/5 (3) 1 (4) 5
- Q.18 The value of $\lim_{h \rightarrow 0} \left[\frac{1}{h(8+h)^{1/3}} - \frac{1}{2h} \right]$ is-
 (1) 1/12 (2) -4/3 (3) -16/3 (4) -1/48
- Q.19 The value of $\lim_{x \rightarrow 3} \left(\frac{x^4 - 81}{x - 3} \right)$ is -
 (1) -27 (2) 108 (3) undefined (4) None of these
- Q.20 $\lim_{x \rightarrow 1} \frac{x-1}{2x^2 - 7x + 5}$ equals -
 (1) 1/3 (2) -1/3 (3) 1/2 (4) -1/2
- Q.21 $\lim_{x \rightarrow 1} \frac{1-x^{-1/3}}{1-x^{-2/3}}$ equals-
 (1) 1/3 (2) 1/2 (3) 2/3 (4) -2/3
- Q.22 $\lim_{x \rightarrow 3} \frac{x-3}{\sqrt{x-2} - \sqrt{4-x}}$ equals-
 (1) 0 (2) 3/2 (3) 1/4 (4) None of these

- Q.23 $\lim_{x \rightarrow 0} \frac{\sqrt{1+x}-1}{x}$ equals-
- (1) 1 (2) 1/2 (3) 0 (4) None of these
- Q.24 $\lim_{x \rightarrow 0} \frac{\sin 4x}{1-\sqrt{(1-x)}}$ equals-
- (1) 4 (2) 8 (3) 10 (4) None of these
- Q.25 $\lim_{x \rightarrow 3} \frac{\sqrt{x^2+7}-4}{x^2-5x+6}$ equals-
- (1) 0 (2) 1/2 (3) 3/2 (4) 3/4
- Q.26 $\lim_{x \rightarrow 0} \frac{x \cos x - \sin x}{x^2 \sin x}$ equals-
- (1) 1/3 (2) -1/3 (3) 3 (4) -3
- Q.27 $\lim_{x \rightarrow 0} \frac{1 + \sin x - \cos x + \log(1-x)}{x^3}$ equals-
- (1) 1/2 (2) -1/2 (3) 0 (4) None of these
- Q.28 $\lim_{x \rightarrow 0} \frac{x \cdot 2^x - x}{1 - \cos x}$ is equal to -
- (1) $\log 2$ (2) $\log 4$ (3) 0 (4) None of these
- Q.29 $\lim_{x \rightarrow \pi/2} \frac{2x - \pi}{\cos x}$ equals-
- (1) 2 (2) -2 (3) 1 (4) -1
- Q.30 $\lim_{x \rightarrow 0} x \log x$ equals-
- (1) e (2) 1/e (3) 1 (4) 0
- Q.31 $\lim_{x \rightarrow a} \frac{x^m - a^m}{x^n - a^n}$ equals-
- (1) m/n (2) 0 (3) $\frac{m}{n} a^{m-n}$ (4) $\frac{n}{m} a^{n-m}$
- Q.32 The value of $\lim_{x \rightarrow 64} \frac{x^{1/2} - 8}{x^{1/3} - 4}$ is-
- (1) 1 (2) 2 (3) 3 (4) None of these
- Q.33 $\lim_{x \rightarrow \pi/4} \frac{\sqrt{2} \cos x - 1}{\cot x - 1}$ equals-
- (1) 1 (2) 1/2 (3) $1/\sqrt{2}$ (4) $1/2 \sqrt{2}$

Q.34 The value of $\lim_{x \rightarrow 0} \frac{(16 + 5x)^{1/4} - 2}{(32 + 3x)^{1/5} - 2}$ is-

- (1) 4/5 (2) 25/6 (3) 3/8 (4) None of these

Q.35 The value of $\lim_{x \rightarrow \pi/2} \frac{1 - \sin^3 x}{\cos^2 x}$ is-

- (1) $-\frac{3}{2}$ (2) $\frac{3}{2}$ (3) 1 (4) 0

Q.36 $\lim_{x \rightarrow \pi/2} \frac{1 - \sin x}{\left(x - \frac{\pi}{2}\right)^2}$ equals-

- (1) 0 (2) 1 (3) $\frac{1}{2}$ (4) $-\frac{1}{2}$

Q.37 The value of $\lim_{x \rightarrow \pi/2} \cos x \log(\tan x)$ is-

- (1) 1 (2) -1 (3) 0 (4) None of the

Q.38 $\lim_{x \rightarrow 1} \frac{1 + \log x - x}{1 - 2x + x^2}$ equals-

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

Q.39 The value of $\lim_{x \rightarrow \infty} \frac{x^5}{5^x}$ is -

- (1) 0 (2) 1 (3) e^5 (4) e^{-5}

Q.40 The value of $\lim_{x \rightarrow 0} \frac{\log(1 + kx^2)}{1 - \cos x}$ is -

- (1) 0 (2) 1 (3) k (4) 2k

Q.41 $\lim_{x \rightarrow 0} \left[\frac{\log(1+x)}{x} \right]^{1/x}$ equals-

- (1) e (2) e^{-1} (3) e^2 (4) $e^{-1/2}$

Q.42 $\lim_{x \rightarrow 0} [1 + \tan x]^{\cot x}$ equals-

- (1) 1 (2) e (3) e^{-1} (4) None of these

Q.43 $\lim_{x \rightarrow 0} \frac{\sin^2 x}{x \cos x}$ equals-

- (1) 1 (2) 2 (3) 0 (4) 1/2

Q.44 $\lim_{x \rightarrow 0} \frac{\sqrt{1 - \cos x^2}}{1 - \cos x}$ equals-

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

Q.45 $\lim_{x \rightarrow \infty} \left(1 + \frac{a}{x}\right)^x$ equals-

- (1) a^x (2) e (3) a (4) e^a

Q.46 $\lim_{x \rightarrow \infty} \left[1 + \frac{4}{x-1}\right]^{x+3} =$

- (1) e^2 (2) e (3) e^4 (4) e^3

Q.47 If $\lim_{x \rightarrow 0} \frac{\sin px}{\tan 3x} = 4$, then p is equal to-

- (1) 6 (2) 9 (3) 12 (4) 4

Q.48 The value of $\lim_{x \rightarrow \infty} x^{1/x}$ is-

- (1) 0 (2) 1 (3) ∞ (4) None of these

Q.49 If $\lim_{x \rightarrow \infty} x \sin\left(\frac{\pi}{8x}\right) \cos\left(\frac{\pi}{8x}\right) = k$, then value of k is-

- (1) $\pi/4$ (2) $\pi/3$ (3) $\pi/2$ (4) $\pi/8$

ANSWER- KEY

Q.1	3	Q.2	2	Q.3	2	Q.4	4	Q.5	4
Q.6	4	Q.7	4	Q.8	2	Q.9	1	Q.10	1
Q.11	1	Q.12	4	Q.13	1	Q.14	3	Q.15	2
Q.16	1	Q.17	1	Q.18	4	Q.19	2	Q.20	2
Q.21	2	Q.22	4	Q.23	2	Q.24	2	Q.25	4
Q.26	2	Q.27	2	Q.28	2	Q.29	2	Q.30	4
Q.31	3	Q.32	3	Q.33	2	Q.34	2	Q.35	2
Q.36	3	Q.37	3	Q.38	3	Q.39	1	Q.40	4
Q.41	4	Q.42	2	Q.43	3	Q.44	1	Q.45	4
Q.46	3	Q.47	3	Q.48	2	Q.49	4		