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QB365 Question Bank Software Study Materials

Differential Calculus - Limits and Continuity 50 Important 1 Marks Questions With Answers (Book Back and Creative)

11th Standard

Maths

Total Marks : 50

Multiple Choice Question

50 x 1 = 50

1) $lim_{x\to\infty}\frac{sin\ x}{x}$

(a) 1 **(b) 0** (c) ∞ (d) $-\infty$

2) $lim_{x\to\pi/2}\frac{2x-\pi}{cosx}$

(a) 2 (b) 1 **(c) -2** (d) 0

3) $lim_{x\to0}\frac{\sqrt{1-cos2x}}{x}$

(a) 0 (b) 1 (c) $\sqrt{2}$ **(d) does not exist**

4) $lim_{\theta\to0}\frac{Sin\sqrt{\theta}}{\sqrt{sin\theta}}$

(a) 1 (b) -1 (c) 0 (d) 2

5) $\lim\limits_{x\to\infty}\left(\frac{x^2+5x+3}{x^2+x+3}\right)^x$ is

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

6) $lim_{x\to\infty}\frac{\sqrt{x^2-1}}{2x+1}=$

(a) 1 (b) 0 (c) -1 **(d)** $\frac{1}{2}$

7) $lim_{x\to0}\frac{a^x-b^x}{x}=$

(a) log ab **(b) $\log(\frac{a}{b})$** (c) $\log(\frac{b}{a})$ (d) $\frac{a}{b}$

8) $lim_{x\to o}\frac{8^x-4^x-2^x+1^x}{x^2}=$

(a) 2 log 2 **(b) 2(log2)^2** (c) log 2 (d) 3 log 2

9) If f(x) = x(-1)$^{\lfloor\frac{1}{x}\rfloor}$, $x\leq0$, then the value of $lim_{x\to0}f(x)$ is equal to

(a) -1 **(b) 0** (c) 2 (d) 4

10) $lim_{x\to3}\lfloor x\rfloor=$

(a) 2 (b) 3 **(c) does not exist** (d) 0

11) Let the function f be defined by $f(x)=\begin{cases}3x & 0\leq x\leq1\\ -3x+5 & 1<x\leq2\end{cases}$, then

(a) $lim_{x\to1}f(x)=1$ (b) $lim_{x\to1}f(x)=3$ (c) $lim_{x\to1}f(x)=2$ **(d) $lim_{x\to1}f(x)$ does not exist**

12) If f : $R\to R$ is defined by f(x)=$\lfloor x-3\rfloor+|x-4|$ for $x\in R$, then $lim_{x\to3^-}f(x)$ is equal to

(a) -2 (b) -1 **(c) 0** (d) 1

13) $lim_{x\to0}\frac{xe^x-sin\ x}{x}$ is

(a) 1 (b) 2 (c) 3 **(d) 0**

14) If $lim_{x\to 0}\frac{sin\ px}{tan\ 3x} = 4$, then the value of p is

(a) 6 (b) 9 **(c) 12** (d) 4

15) $lim_{\alpha\to\pi/4}\frac{sin\alpha - cos\alpha}{\alpha - \frac{\pi}{4}}$ is

(a) $\sqrt{2}$ (b) $\frac{1}{\sqrt{2}}$ (c) 1 (d) 2

16) $lim_{n\to\infty}(\frac{1}{n^2} + \frac{2}{n^2} + \frac{3}{n^2} + .. + \frac{n}{n^2})$ is

(a) $\frac{1}{2}$ (b) 0 (c) 1 (d) ∞

17) $lim_{x\to 0}\frac{e^{sin\ x} - 1}{x} =$

(a) 1 (b) e (c) $\frac{1}{e}$ (d) 0

18) $lim_{x\to 0}\frac{e^{tan\ x} - e^x}{tanx - x} =$

(a) 1 (b) e (c) $\frac{1}{2}$ (d) 0

19) The value of $lim_{x\to 0}\frac{sinx}{\sqrt{x^2}}$ is

(a) 1 (b) -1 (c) 0 **(d) limit does not exist**

20) The value of $lim_{x\to k^-} x - \lfloor x \rfloor$, where k is an integer is

(a) -1 **(b) 1** (c) 0 (d) 2

21) At x = $\frac{3}{2}$ the function $f(x) = \frac{|2x-3|}{2x-3}$ is

(a) continuous **(b) discontinuous** (c) differentiable (d) non-zero

22) Let f : $R \to R$ be defined by $f(x) = \begin{cases} x & x \text{ is irrational} \\ 1 - x & x \text{ is rational} \end{cases}$ then f is

(a) discontinuous at x = $\frac{1}{2}$ **(b) continuous at x = $\frac{1}{2}$** (c) continuous everywhere (d) discontinuous everywhere

23) The function $f(x) = \begin{cases} \frac{x^2-1}{x^3+1} & x \neq -1 \\ P & x = -1 \end{cases}$ is not defined for x = −1. The value of f(−1) so that the function extended by this value is continuous is

(a) $\frac{2}{3}$ **(b) -$\frac{2}{3}$** (c) 1 (d) 0

24) Let f be a continuous function on [2, 5]. If f takes only rational values for all x and f(3) = 12, then f(4.5) is equal to

(a) $\frac{f(3)+f(4.5)}{7.5}$ **(b) 12** (c) 17.5 (d) $\frac{f(4.5)-f(3)}{1.5}$

25) Let a function f be defined by $f(x) = \frac{x-|x|}{x}$ for x ≠ 0 and f(0) = 2. Then f is

(a) continuous nowhere (b) continuous everywhere (c) continuous for all x except x = 1

(d) continuous for all x except x = 0

26) $\lim_{x\to 2}\frac{2x^2+x+1}{x+2}$ is equal to

(a) $\frac{1}{2}$ (b) 2 **(c)** $\frac{11}{4}$ (d) 0

27) $\lim_{x\to 1}\frac{x^m-1}{x^n-1} is$

(a) mn (b) m+n (c) m-n **(d)** $\frac{m}{n}$

28) $\lim_{x\to\infty}\left(\frac{1}{x} + 2\right)$ is equal to

(a) ∞ (b) 0 (c) 1 **(d) 2**

29) $\lim_{x\to\frac{\pi}{2}}\frac{\sin x}{x} =$

(a) π (b) $\frac{\pi}{2}$ **(c)** $\frac{2}{\pi}$ (d) 1

30) The function y = $\frac{|3x-4|}{3x-4}$ is discontinuous at x =

(a) 0 (b) $\frac{3}{4}$ **(c)** $\frac{4}{3}$ (d) 1

31) The function $f(x) = \tan x$ is discontinuous on the set

(a) $\{n\pi : \quad n \in z\}$ (b) $\{2n\pi : \quad n \in z\}$ **(c)** $\{(2n+1)\frac{\pi}{2}, \quad n \in z\}$ (d) $\{n\frac{\pi}{2}, \quad n \in z\}$

32) For what values of x is the rate of increase of $x^3 - 2x^2 + 3x + 8$ is twice the rate of increase of x?

(a) $(-\frac{1}{3}, -3)$ (b) $(\frac{1}{3}, 3)$ (c) $(-\frac{1}{3}, 3)$ **(d)** $(\frac{1}{3}, 1)$

33) The slope of the graph of $f(x) = \frac{|x|}{x}, x > 0 \quad is$

(a) 1 **(b) 0** (c) -1 (d) undefined

34) The points of discontinuity of the function $\frac{x^2+6x+8}{x^2-5x+6} is$

(a) 3,2 (b) 3,-2 (c) -3,2 (d) -3,-2

35) A function f(x) is said to be continuous at x=a if $\lim_{x\to a} f(x)$ is equal to

(a) $f(a)$ (b) $f(-a)$ (c) $2f(a)$ (d) $f(\frac{1}{a})$

36) Choose the incorrect statement

(a) log 1 to any base is zero (b) $\frac{d}{dx}(e^x)=e^x$ **(c) Inverse function of log x is** $\frac{1}{x}$ (d) |x| is not differentiable at x =0

37) If $f(x) = 0$ be a quadratic equation such that $f(-\pi) = f(\pi) = 0$ anid $f(\frac{\pi}{2}) = -\frac{3\pi^2}{4}$, then $\lim_{x\to-\pi} \frac{f(x)}{\sin(\sin x)}$ is equal to

(a) 0 (b) π **(c)** 2π (d) None of these

38) $\lim_{x\to\infty} \frac{2+2x+\sin 2x}{(2x+\sin 2x)e^{\sin x}}$ is equal to

(a) 0 (b) 1 (c) -1 (d) Does not exists

39) $\lim_{x\to\infty} \left(\frac{x^3}{3x^2-4} - \frac{x^2}{3x+2}\right)$ is equal to

(a) Does not exist (b) $\frac{1}{3}$ (c) 0 **(d)** $\frac{2}{9}$

40) $\lim_{x\to0} \frac{x(e^x-1)}{1-\cos x}$ is equal to

(a) 0 (b) ∞ (c) 2 **(d) -2**

41) $\lim_{n\to\infty} \frac{n(2n+1)^2}{(n+2)(n^2+3n-1)}$ is equal to

(a) 0 (b) 2 **(c) 4** (d) ∞

42) The value of $\lim_{x\to2} \frac{\sqrt{1+\sqrt{2+x}}-\sqrt{3}}{x-2}$ is

(a) $\frac{1}{8\sqrt{3}}$ (b) $\frac{1}{4\sqrt{3}}$ (c) 0 (d) None of these

43) $\lim_{x\to0} \frac{x^a \sin^b x}{\sin(x^c)}$, where $a, b, c \in R - \{0\}$, exists and has non-zero value then

(a) a + c = b (b) b + c = a **(c) a + b = c** (d) none of these

44) The function $f(x) = \frac{4-x^2}{4x-x^3}$ is

(a) Discontinuous at only one point (b) Discontinuous exactly at two points **(c) Discontinuous exactly at three points**

(d) None of these

45) The function $f(x) = \frac{(3^x-1)^2}{\sin x \ln(1+x)}, x \neq 0,$ is continuous at $x = 0$. Then the value of $f(0)$ is

(a) $2\log_e 3$ **(b)** $(\log_e 3)^2$ (c) $\log_e 6$ (d) None of these

46) Let $f(x)=\begin{cases}\frac{x-4}{|x-4|}+a, & x<4\\ a+b, & x=4\\ \frac{x-4}{|x-4|}+b, & x>4\end{cases}$ Then f(x) is continuous

(a) a = 0, b = 0 (b) a = 1, b = 1 (c) a = -1, b = 1 **(d) a = 1, b = -1**

47) The value $f(0)$, so that the function $f(x)=\frac{2x-\sin^{-1}x}{2x+\tan^{-1}x}$ is continuous at each point in its domain is equal to

(a) 2 **(b)** $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) $-\frac{1}{3}$

48) The point of discontinuity for the function $\frac{2x^2-8}{x-2}$ is

(a) 0 (b) 8 **(c) 2** (d) 4

49) The value of $\lim\limits_{x\to\infty}\dfrac{\sqrt{x^2-1}}{2x+1}$ is :

(a) -1 (b) 1 **(c)** $\frac{1}{2}$ (d) 0

50) Let $f(x)=\begin{cases}\frac{x^3+x^2-16x+20}{(x-2)^2}, & \text{if } x\neq 2\\ k, & \text{if } x=2\end{cases}$ if $f(x)$ is continuous for all x, then k is equal to

(a) 2 (b) 3 (c) 6 **(d) 7**