CONTINUITY

1. If the function $f(x)=\begin{cases}5x-4 & ,\text{ if } 0<x\le 1\\ 4x^2+3bx, & \text{if } 1<x<2\end{cases}$ is continuous at every point of its domain, then the value of b is

(a) –1 (b) 0 (c) 1 (d) None of these

2. If $f(x)=\begin{cases}\dfrac{\log(1+2ax)-\log(1-bx)}{x}, & x\ne 0\\ k & , x=0\end{cases}$ is continuous at $x=0$, then k equals

(a) $2a+b$ (b) $2a-b$ (c) $b-2a$ (d) $b+a$

3. If $f(x)=\begin{cases}x & , \text{ when } 0\le x<1\\ k-2x & , \text{ when } 1\le x\le 2\end{cases}$ is continuous at $x=1$, then value of k is

(a) 1 (b) –1 (c) 3 (d) 2

4. If $f(x)=\begin{cases}x & , x<0\\ 1 & , x=0\\ x^2 & , x>0\end{cases}$, then true statement is

(a) $\lim_{x\to 0} f(x)=1$ (b) $\lim_{x\to 0} f(x)=0$ (c) $f(x)$ is continuous at $x=0$ (d) $\lim_{x\to 0} f(x)$ does not exist

5. If $f(x)=\dfrac{x-a}{\sqrt{x}-\sqrt{a}}$ is continuous at $x=a$, then $f(a)$ equals

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

6. If $f(x)=\begin{cases}x^2 & , \text{ when } x\ne 1\\ 2 & , \text{ when } x=1\end{cases}$ then

(a) $\lim_{x\to 1} f(x)=2$ (b) $f(x)$ is continuous at $x=1$ (c) $f(x)$ is discontinuous at $x=1$ (d) None of these

7. Let $f(x)=\begin{cases}\dfrac{\sin \pi x}{5x} & , x\ne 0\\ k & , x=0\end{cases}$. If $f(x)$ is continuous at $x=0$, then $k=$

(a) $\dfrac{\pi}{5}$ (b) $\dfrac{5}{\pi}$ (c) 1 (d) 0

8. Function $f(x)=x-|x|$ is

(a) Discontinuous at $x=0$ (b) Discontinuous at $x=1$ (c) Continuous at all points (d) Discontinuous at all points

9. Let $f(x)=\dfrac{\sqrt{1+\sin x}-\sqrt{1-\sin x}}{x}$ the value which should be assigned to f at $x=0$ so that it is continuous everywhere is

(a) $\dfrac{1}{2}$ (b) –2 (c) 2 (d) 1

10. The value of $f(0)$ so that the function $f(x)=\dfrac{\sqrt{1+x}-(1+x)^{1/3}}{x}$ becomes continuous is equal to

(a) $\dfrac{1}{6}$ (b) $\dfrac{1}{4}$ (c) 2 (d) $\dfrac{1}{3}$

11. If $f(x)=\begin{cases}\dfrac{|x-a|}{x-a} & \text{when } x\ne a\\ 1 & \text{when } x=a\end{cases}$ then

(a) $f(x)$ is continuous at $x=a$ (b) $f(x)$ is discontinuous at $x=a$ (c) $\lim_{x\to a} f(x)=1$ (d) None of these

12. If $f(x)=\begin{cases}\dfrac{x}{e^{1/x}+1}, & \text{when } x\ne 0\\ 0 & , \text{when } x=0\end{cases}$ then

(a) $\lim_{x\to 0^+} f(x)=1$ (b) $\lim_{x\to 0^-} f(x)=1$ (c) $f(x)$ is continuous at $x=0$ (d) None of these

13. If $f(x)=\dfrac{1}{2}x-1$, then on the interval $[0, \pi]$

(a) $\tan[f(x)]$ and $\dfrac{1}{f(x)}$ are both continuous (b) $\tan[f(x)]$ and $\dfrac{1}{f(x)}$ are both discontinuous

(c) $\tan[f(x)]$ and $f^{-1}(x)$ are both continuous

(d) $\tan[f(x)]$ is continuous but $\frac{1}{f(x)}$ is not continuous

14. Let $f(x)=[x]+\sqrt{x-[x]},$ where $[x]$ denotes the greatest integer function. Then,

(a) $f(x)$ is continuous on R^+

(b) $f(x)$ is continuous on R

(c) $f(x)$ is continuous on $R-Z$

(d) None of these