Assignment – 10

1) Let $f(x)=\begin{cases} sin\frac{1}{x}, & x\neq 0 \\ 0, & x=0 \end{cases}$. Then

a) f has removal discontinuity at $x=0$

b) f has discontinuity of first kind at $x=0$

c) f has discontinuity of first kind from the right at $x=0$

d) f has discontinuity of second kind at $x=0$

Answer: d)

2) $f(x)=[\sin x]$, where [ ] denotes the greatest integer function, is continuous at

a) $\frac{\pi}{2}$

b) π

c) $\frac{3\pi}{2}$

d) 2π

Answer: c)

3) If $f(x)=||x|-1|$, then points, where f is not differentiable, is/are

a) 0, -1 and 1 only

b) 1 and -1 only

c) 0 only

d) 1 only

Answer: a)

4) If the function $g(x)=\begin{cases} k\sqrt{x+1}, & 0\leq x\leq 3 \\ mx+2, & 3<x\leq 5 \end{cases}$ is differentiable, then the value of $k+m$ is

a) 2

b) 16/5

c) 10/3

d) 4

Answer: a)

5) The set of points, where $f(x)=\frac{x}{1+|x|}$ is differentiable, is

a) $(-\infty,-1)\cup(-1,\infty)$

b) $(-\infty,\infty)$

c) $(0,\infty)$

d) $(-\infty,0)\cup(0,\infty)$

Answer: b)

6) Suppose $f(x)$ is differentiable at $x=1$ and $\lim_{h\to 0}\frac{1}{h}f(1+h)=5$, then $f'(1)$ equals

a) 6
b) 5
c) 4
d) 3

Answer: b)

7) Let f be differentiable in . If $f(1)=-2$ and $f'(x)\geq 2$ for $x\in[1,6]$, then

a) $f(6)=5$
b) $f(6)<5$
c) $f(6)<8$
d) $f(6)\geq 8$

Answer: d)

8) The number of points of $f(x)=|x-1|+|x-3|+sinx$, $x\in[0,4)$, where $f(x)$ is not differentiable is

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

Answer: c)

9) The function $f(x)=asin|x|+be^{|x|}$ is differentiable at $x=0$, when

a) $3a+b=0$
b) $3a-b=0$
c) $a+b=0$
d) $a-b=0$

Answer: c)

10) If $f(x)=\begin{cases} x^2|\cos\frac{\pi}{x}|, & x\neq 0 \\ 0, & x=0 \end{cases}$, Then f is

a) Differentiable both at $x=0$ and at $x=2$
b) Differentiable at $x=0$ but not differentiable at $x=2$
c) Not differentiable at $x=0$ but differentiable at $x=2$
d) Differentiable neither at $x=0$ nor at $x=2$

Answer: b)