All Branches Hinglish

Subject: Engineering Mathematics

DPP-04

Chapter: Calculus

Topic : Continuity and Differentiability of Function

1. Consider the function $f(x) = |x|$ in the interval $-1 \le x \le 1$. At the point x = 0, $f(x)$ is

(a) Continuous and differentiable

(b) Non-continuous and differentiable

(c) Continuous and non-differentiable

(d) Neither continuous nor differentiable

2. The function $y = |2 - 3x|$

(a) is continuous $\forall\ x \in R$ and differntiable $\forall\ x \in R$

(b) is continuous $\forall\ x \in R$ and differntiable $\forall\ x \in R$ except at $x = 3/2$

(c) is continuous $\forall\ x \in R$ and differntiable $\forall\ x \in R$ except at $x = 2/3$

(d) is continuous $\forall\ x \in R$ except $x = 3$ and differntiable $\forall\ x \in R$

3. Consider the function $f(x) = |x^3|$, where x is real. Then the function $f(x)$ at $x = 0$ is

(a) Continuous but not differentiable

(b) Once differentiable but not twice

(c) Twice differentiable but not thrice

(d) Three differentiable

4. The value of x for which the function $f(x) = \dfrac{x^2 - 3x - 4}{x^2 + 3x - 4}$ is NOT continuous are

(a) 4 and –1 (b) 4 and 1

(c) –4 and 1 (d) –4 and –1

5. If $y = |x|$ for $x < 0$ and $y = x$ for $x \ge 0$, then

(a) $\dfrac{dy}{dx}$ is discontinuous at $x = 0$

(b) y is discontinuous at $x = 0$

(c) y is not defined at $x = 0$

(d) None of these

6. The function $f(x) = |x + 1|$ on the interval $[-2, 0]$ is

(a) Continuous and differentiable

(b) Continuous on the integers but not differentiable at all points

(c) Neither continuous nor differentiable

(d) Differentiable but not continuous

7. If a function is continuous at a point, its first derivative

(a) May or may not exist

(b) Exists always

(c) Will not exist

(d) Has unique value

8. If function $f(x)$ is defined as: $f(x) = \dfrac{xe^{1/x}}{1 + e^{1/x}};\quad x \ne 0$

$= 0;\quad x = 0$

(a) $f(x)$ is continuous and differentiable

(b) $f(x)$ is not continuous but differentiable

(c) $f(x)$ is continuous but not differentiable

(d) None

Answer Key

1. (c)
2. (c)
3. (c)
4. (c)
5. (a)
6. (b)
7. (a)
8. (c)