All Branches Hinglish

Subject: Engineering Mathematics

DPP-05

Chapter: Calculus

Topic : Mean Value Theroem

1. If $f(x) = x^3 - 6x^2 + 11x - 6$ is on [1, 3], then the point $c \leftrightarrow 1, 3$ such that $f'(c) = 0$ is given by

(a) $c = 2 \pm \frac{1}{\sqrt{2}}$ (b) $c = 2 \pm \frac{1}{\sqrt{3}}$

(c) $c = 2 \pm \frac{1}{2}$ (d) None of these

2. Let $f(x) = \sin 2x$, $0 \le x \le \frac{\pi}{2}$ and $f'(c) = 0$ for $c \leftrightarrow 0, \frac{\pi}{2}$. Then, c is equal to

(a) $\frac{\pi}{4}$ (b) $\frac{\pi}{3}$

(c) $\frac{\pi}{6}$ (d) None

3. Let $f(x) = x(x + 3)\, e^{-x/2}$, $-3 \le x \le 0$. Let $c \leftrightarrow]-3, 0[$ such that $f'(c) = 0$. Then, the value of c is

(a) 3 (b) –3

(c) –2 (d) –1/2

4. If Rolle's theorem holds for $f(x) = x^3 - 6x^2 + kx + 5$ on [1, 3] with $c = 2 + \frac{1}{\sqrt{3}}$, then value of k is

(a) –3 (b) 3

(c) 7 (d) 11

5. A point on the parabola $y = (x - 3)^2$, where the tangent is parallel to the chord joining A (3, 0) and B (4, 1) is

(a) (7, 1) (b) $\left(\frac{3}{2}, \frac{1}{4}\right)$

(c) $\left(\frac{7}{2}, \frac{1}{4}\right)$ (d) $\left(-\frac{1}{2}, \frac{1}{2}\right)$

6. A point on the curve $y = \sqrt{x-2}$ on [2, 3] where the tangent is parallel to the chord joining the end points of the curve is

(a) $\left(\frac{9}{4}, \frac{1}{2}\right)$ (b) $\left(\frac{7}{2}, \frac{1}{4}\right)$

(c) $\left(\frac{7}{4}, \frac{1}{2}\right)$ (d) $\left(\frac{9}{2}, \frac{1}{4}\right)$

7. Let $f(x) = x(x - 1)(x - 2)$ be defined in $\left[0, \frac{1}{2}\right]$. Then, the value of c of the mean value theorem is

(a) 0.16 (b) 0.20

(c) 0.24 (d) None

8. Let $f(x) = \sqrt{x^2 - 4}$ be defined in [2, 4]. Then, the value of c of the mean value theorem is

(a) $-\sqrt{6}$ (b) $\sqrt{6}$

(c) $\sqrt{3}$ (d) $2\sqrt{3}$

Answer Key

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