RK VISION ACADEMY

NEET | IIT – JEE | FOUNDATION

CBSE PRACTICE PAPER(2024)

(Mathematics)

Grade : XII **Marks: 40 marks**

Chapter: LIM AND DER Set-2 **Time: 90 minutes**

SECTION A

(This section comprises of Multiple-choice questions (MCQ) of 1 mark each.)

1. $\begin{cases} \frac{\sin x}{x} + \cos x & if\ x \neq 0 \\ k & if\ x = 0 \end{cases}$

(A) 3 (B) 2 (C) 1 (D) 1.5

2. The function f (x) = [x], where [x] denotes the greatest integer function,is continuous at

(A) 4 (B) – 2 (C) 1 (D) 1.5

3. $\frac{1}{x - [x]}$

(A) 4 (B) – 2 (C) 1 (D) 1.5

4. The function given by f (x) = tanx is discontinuous on the set

(A) {n π; n ∈ : Z} (B) {2 n π : n ∈Z} (C) $\frac{n}{2}$ $\frac{n\pi}{2}$

5. Let f (x)= |cosx|. Then,

(A) f is everywhere differentiable. (B) f is everywhere continuous but not differentiable at n = nπ, n∈Z . (C) f is everywhere continuous but not differentiable at π (D) none of these.

6. The function f (x) = |x| + |x – 1| is

(A) continuous at x = 0 as well as at x = 1. (B) continuous at x = 1 but not at x = 0. (C) discontinuous at x = 0 as well as at x = 1. (D) continuous at x = 0 but not at x = 1.

7. $\frac{x^2}{2} + 1$

If f (x) = 2x and g (x) = , then which of the following can be a discontinuous function

(A) f (x) + g (x) (B) f (x) – g (x) (C) f (x) . g (x) (D) $\frac{f(x)}{g(x)}$

8. $\frac{dy}{dx}$

If $y=\sqrt{\sin x + y}$ then find

(A) $\frac{\cos x}{2y-1}$ (B) $\frac{\cos x}{1-2y}$ (C) $\frac{\cos x}{2y-1}$ (D) $\frac{\sin x}{1-2y}$

9. The derivative of $\cos^{-1}(2x^2 - 1)$ w.r.t. $\cos^{-1}x$ is

(A) 2 (B) $\frac{-1}{2\sqrt{1-x^2}}$ (C) $\frac{2}{x}$ (D) $1 - x^2$

10 The value of c in Rolle's theorem for the function f (x) = x^3 – 3x in the interval [0, 3] is

(A) 1 (B) – 1 (C) $\frac{3}{2}$ $\frac{1}{2}$

SECTION B

(This section comprises of very short answer type-questions (VSA) of 2 marks each.)

11 Examine the continuity of the function f (x) = $x^3 + 2x^2 - 1$ at x = 1

12 If f (x) = |cos x – sinx|, find $f'\left(\frac{\pi}{6}\right)$

13 Verify mean value theorem for the function f (x) = (x – 3) (x – 6) (x – 9) in [3, 5].

SECTION C

(This section comprises of short answer type questions (SA) of 3 marks each)

14 $\frac{dy}{dx}$ $\theta = \left(\frac{\pi}{2}\right)$

15 $\frac{dy}{dx}$

16 Differentiate $\tan^{-1}$ (sec x+ tan x)

SECTION D

(This section comprises of long answer-type questions (LA) of 5 marks each)

17 $\left(\sqrt{1-x^2}\right)$

18
$$\begin{cases} \frac{1-\cos 4x}{x^2} & x < 0 \\ a & x = 0 \\ \frac{\sqrt{x}}{} & x > 0 \end{cases}$$

19 $\frac{dy}{dx} = \frac{y}{x}$ $\frac{d^2y}{dx^2} = 0$