

Paper: MathsTotal Marks: 40Month Test: July

Obt. Marks: _____

Theme/Unit: 2Grand Total: 40

Objective/Subjective:

ID: _____

Time: _____

Name: _____

class: 12th

Section: _____

**Q. No. 1: Encircle the correct option:****/10**1. $\lim_{\delta x \rightarrow 0} \frac{f(x+\delta x) - f(x)}{\delta x}$ equals:

- a. 0
- b. $f'(x)$
- c. $f'(0)$
- d. 1

2. If $f(x) = \cos x$, then $f'(\sin^{-1}x) =$ _____?

- a. $-\sin x$
- b. $-x$
- c. 1
- d. $\frac{1}{\sqrt{1-x^2}}$

3. If $f(x) = \ln(1+x)$, then $f'(x)$ equals:

- a. $1+x$
- b. $\frac{1}{1-x}$
- c. $\frac{1}{1+x}$
- d. $1-x$

4. $\frac{d}{dx}(ax^{m-1} + bx^n) =$ _____?

- a. $ax^{m-1} + bx^{n-1}$
- b. $amx^{m-1} + bnx^{n-1}$
- c. $x^{m-1} + x^{n-1}$
- d. $mx^{m-1} + nx^{n-1}$

5. $\frac{d}{dx}(\sqrt{\tan x}) =$ _____?

- a. $\frac{\sec^2 x}{2\sqrt{\tan x}}$
- b. $\frac{\sec^2 x}{\sqrt{\tan x}}$
- c. $\frac{\sec x}{2\sqrt{\tan x}}$
- d. $\frac{\sqrt{\sec x}}{\tan x}$

6. $\frac{d}{dx}(-\operatorname{cosec} x) =$ _____?

- a. $\cot^2 x$
- b. $\operatorname{cosec}^2 x$
- c. $\tan x \operatorname{cosec} x$
- d. $\operatorname{Cosec} x \cot x$

7. $\frac{d}{dx}(y^n) = \underline{\hspace{2cm}}?$

a. ny^{n-1}

b. $ny^{n-1} \frac{dy}{dx}$

c. $ny^{n-1} \frac{dx}{dy}$

d. $ny^{n+1} \frac{dy}{dx}$

8. $\frac{d}{dx}(e^x) = \underline{\hspace{2cm}}?$

a. xe^x

b. e^{-x}

c. e^x

d. $-e^x$

9. The derivative of $(\sec^{-1}x + \operatorname{cosec}^{-1}x)$ is equal to:

a. $\frac{1}{x\sqrt{x^2-1}}$

b. $\frac{1}{1+a^2}$

c. 0

d. $\frac{1}{\sqrt{x^2-1}} - \frac{1}{\sqrt{x^2+1}}$

10. The derivative of $\sin(\sin a)$ w.r.t a is:

a. $\cos(\sin a)$

b. $\cos(\sin a) \cdot \cos a$

c. $\cos(\cos a)$

d. 0

Short Questions:

/14

1. Write the steps of derivative of function $f(x)$ by first principle rule.

2. Find the derivative of $f(x) = c$ by definition.

3. Find derivative of $y = (2\sqrt{x} + 2)(x - \sqrt{x})$ w.r.t x

4. Find $\frac{dy}{dx}$ if $y(x^2 - 1) = x\sqrt{x^2 + 4}$

5. Differentiate w.r.t the variable involved of $(\sin 2\theta - \cos 3\theta)^2$

6. Differentiate w.r.t x $\cos^{-1}\left(\frac{1-x^2}{1+x^2}\right)$

7. Find $\frac{dy}{dx}$ if $y = x^2 \ln \frac{1}{x}$

Long Questions:

Q:1 (a). Find from first principle, w.r.t to independent variable x^{-100}

/4

(b): Find $\frac{dy}{dx}$ from first principle if $\frac{1}{\sqrt{x+a}}$

/4

Q:2 (a). find $\frac{dy}{dx}$ if $y = \frac{x\sqrt{a+x}}{\sqrt{a-x}}$

/4

(b): if $x = a\cos^3\theta$, $y = b\sin^3\theta$, show that $a\frac{dy}{dx} + b\tan\theta = 0$

/4