Question No: 1   (Marks: 1)   - Please choose one

$30^0 =$ _____

► $\dfrac{\pi}{3}$
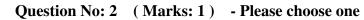
► $\dfrac{\pi}{4}$

► $\dfrac{\pi}{6}$

► $\dfrac{\pi}{2}$

Question No: 2   (Marks: 1)   - Please choose one

Let a function f be defined on an interval, and let x_1 and x_2 denotes two distinct points in that interval. If $f(x_1) = f(x_2)$ for all points x_1 and x_2 then which of the following statement is correct?

► f is a decreasing function
► f is an increasing function
► f is a constant function

Question No: 3   (Marks: 1)   - Please choose one

Tan(x) is continuous every where except at points

► $\pm\dfrac{k\pi}{2}(k = 1,3,5,...)$

► $\pm\dfrac{k\pi}{2}(k = 2,4,6,...)$

► $\pm\dfrac{k\pi}{2}(k = 1,2,3,4,5,6,...)$

Question No: 4   (Marks: 1)   - Please choose one

$\lim\limits_{x\to\infty}(-2x) =$
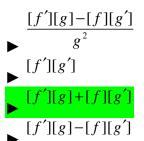
► -2
► 0
► 2
► Does not exist

Question No: 5   (Marks: 1)   - Please choose one

Suppose that f and g are differentiable functions of x then

$\dfrac{d}{dx}[f][g] = \bigcirc$

$$\frac{[f'][g]-[f][g']}{g^2}$$

►

$$[f'][g']$$

►

$$[f'][g]+[f][g']$$

►

$$[f'][g]-[f][g']$$

►

Question No: 6   (Marks: 1)   - Please choose one

The solution set of the inequality $|x+4| \geq 2$ is

► $(-\infty, -6]U[2, +\infty)$

► None of these

► $(-\infty, 6]U[-2, +\infty)$

► $(-\infty, -6] \ U \ [-2, +\infty)$

Question No: 7   (Marks: 1)   - Please choose one

A line is called a tangent line to the circle if it meets the circle at precisely ……………..

► One point
► Two points
► Infinite points

Question No: 8   (Marks: 1)   - Please choose one

Let a function f be defined on an interval, and let x_1 and x_2 denote points in that interval. If $f(x_1) < f(x_2)$ whenever $x_1 < x_2$ then which of the following statement is correct?

► f is an increasing function.

► f is a decreasing function.

► f is a constant function.

Question No: 9   (Marks: 1)   - Please choose one

If $f(x) = 3x^8 + 2x + 1$ then $f'(x) = $ _____

► $3x^7 + 2$

► $24x^7 + 2$

► $3x^9 + 2x^2$

► $24x^9 + 2x^2$

Question No: 10   (Marks: 1)   - Please choose one

π is a ....number

► Integer
► Rational
► Irrational
► Natural

Question No: 11   (Marks: 1)   - Please choose one

The set $\{x : a \leq x \leq b\}$ can be written in the form of interval

► (a,b)
► (a,b]
► [a,b]
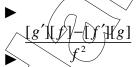
Question No: 12   (Marks: 1)   - Please choose one

Suppose that f and g are differentiable functions of x then

$$\frac{d}{dx}\left[\frac{f}{g}\right] =$$

► $\dfrac{[g][f'] - [f][g']}{g^2}$

► $\dfrac{[g'][f] - [f'][g]}{g^2}$

► $\dfrac{[g][f'] - [f][g']}{f^2}$

► $\dfrac{[g'][f] - [f'][g]}{f^2}$

Question No: 13   (Marks: 1)   - Please choose one

The graph $x = y^2$ is symmetric about ---------axis

► X-axis
► Y-axis
► Origin

Question No: 14   (Marks: 1)   - Please choose one

$$\lim_{x \to -7} \frac{x^2 - 49}{x + 7}$$

► -14
► 0
► ∞
► Limit does not exis

Question No: 15   (Marks: 1)   - Please choose one

Chain rule is a rule for differentiating _____ of functions.

► Product
► Sum
► Difference
► Composition

Question No: 16   (Marks: 1)   - Please choose one

$$\lim_{x \to a} f(x) = ... where\ f(x) = k$$

The   (k is a constant)

► k+2
► k+1
► k

Question No: 17   (Marks: 1)   - Please choose one

For any number $\varepsilon > 0$ if we can find an open interval (x_0, x_1) on the x-axis containing the point "a" such that $L - \varepsilon < f(x) < L + \varepsilon$ for each x in (x_0, x_1) except the possible x = a then we say $\lim_{x \to a} f(x) =$ ---------

► L

- $L - \varepsilon$
- $L + \varepsilon$
- $L + 1$

Question No: 18   (Marks: 1)   - Please choose one

If $2x - y = -3$ then $\dfrac{dy}{dx} =$

- ► 2
- ► -2
- ► 0
- ► -3

Question No: 19   (Marks: 1)   - Please choose one

The graph of the equation $y = x^2 - 4x + 5$ will represent

- ► Parabola
- ► Straight line
- ► Two straight lines

- ► Ellipse

Question No: 20   (Marks: 1)   - Please choose one

The equation of line of the form $y - y_1 = m(x - x_1)$ is known as

- ► Point-slope form
- ► Two points form
- ► Intercepts form
- ► Slope intercept form

Question No: 21   (Marks: 2)

If $y = 5\cos\left(x^2 + 1\right)$ Find dy/dx by using "The chain rule".

Question No: 22   (Marks: 2)

Prove that $\lim_{x \to 1}(x + 5) = 6$, using the definition of limit.

Question No: 23   (Marks: 3)

Find an equation of the tangent line to the curve

$$y = \frac{2}{x^2 + x}$$

at the point where $x = 1$

Question No: 24   (Marks: 3)

$$\lim_{x \to 0} \frac{\sin(5x)}{3x}$$

Compute

Question No: 25   (Marks: 5)

$$f(x) = x^4 - 4x^3 + 4x^2$$

Find all critical points of

Question No: 26   (Marks: 5)

$$\frac{dy}{dx} \qquad y = x^2 (\cot x) - \frac{1}{x^2}$$

Find   if