

**MIDTERM EXAMINATION**  
**MTH101- Calculus And Analytical Geometry**

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

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Consider two function  $f(x) = x^2$  and  $g(x) = \sqrt{x}$  then  $f \circ g(x) =$  .....

- ▶  $x$
- ▶  $x^2$
- ▶  $\sqrt{x}$
- ▶ None of these

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

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$$\frac{(x^2 - 4)}{(x - 2)}$$

Natural domain of is

- ▶  $(-\infty, 2) \cup (2, +\infty)$
- ▶  $(-\infty, 2)$
- ▶  $(-\infty, 0)$
- ▶ None of these

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

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The solution of the inequality  $|x - 3| < 3$  is

- ▶  $(-1, 7)$
- ▶  $(1, 7)$
- ▶  $(1, -7)$
- ▶ None of these

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

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If a quantity  $y$  depends on another quantity  $x$  in such a way that each value of  $x$  determines exactly one value of  $y$ , we say that  $y$  is ..... of  $x$

- ▶ relation
- ▶ none of these
- ▶ function

- ▶ not function

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

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The set of all points in the coordinate plane which are at a fixed distance away from a given fixed point represents

- ▶ Parabola
- ▶ Straight line
- ▶ Circle
- ▶ None of these

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

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Let  $L_1$  and  $L_2$  be non vertical lines with slopes  $m_1$  and  $m_2$ , respectively Both the lines are perpendicular if and only if

- ▶  $m_1(-m_2) = 1$
- ▶  $m_1m_2 = -1$
- ▶  $m_1 = -\frac{1}{m_2}$
- ▶ All of these

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

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The equation  $(x+4)^2 + (y-1)^2 = 6$  represents a circle having center at ..... and radius .....

- ▶  $(-4,1),\sqrt{6}$
- ▶  $(-4,1),6$
- ▶  $(-4,-1),\sqrt{6}$
- ▶ None of these

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

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The base of the natural logarithm is

- ▶ 2.71
- ▶ 10
- ▶ 5

- ▶ None of these

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

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$$\frac{d}{dx}[f(g(x))]=$$

- ▶  $f'(g(x)).g'(x)$
- ▶  $f'(g(x))+g'(x)$
- ▶  $f'(g(x)).f'(x)$
- ▶ None of these

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

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$$\frac{dy}{dx} =$$

If  $y=f(g(h(x)))$  and  $u=g(h(x))$  and  $v=h(x)$  then

- ▶  $\frac{dy}{du} \cdot \frac{du}{dv} \cdot \frac{dv}{dx}$
- ▶  $\frac{dy}{du} + \frac{du}{dv} + \frac{dv}{dx}$
- ▶  $\frac{dy}{dx} \cdot \frac{du}{dv} \cdot \frac{dv}{du}$
- ▶ None of these

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

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The  $\tan(x)$  is discontinuous at the points where

- ▶  $\cos(x) = 0$
- ▶  $\sin(x) = 0$
- ▶  $\tan(x) = 0$
- ▶ None of these

**Question No: 12 ( Marks: 1 ) - Please choose one**

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$$\lim_{x \rightarrow 0} \frac{\sin x}{x}$$

Equals to

- ▶ 1
- ▶ 2
- ▶ 3
- ▶ 0

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

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Both Sin(x) and Cos(x) have the same limit and function value at x=0 so both are ..... at x=0

- ▶ Continuous
- ▶ Discontinuous
- ▶ Linear
- ▶ None of these

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

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For a function f(x) to be continuous on interval (a,b) the function must be continuous

- ▶ At all point in (a,b)
- ▶ Only at a and b
- ▶ At mid point of a and b
- ▶ None of these

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

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$\pi$  is called

- ▶ An integer
- ▶ A rational number
- ▶ An irrational number
- ▶ A natural number

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

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

- ▶ Parabola

- ▶ Ellipse
- ▶ Straight line
- ▶ Two straight lines

**Question No: 17 ( Marks: 2 )**

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$$f(x) = \frac{1}{(x-1)}$$

Let . Find the average rate of change of  $f$  over the interval  $[3, 5]$ .

**Question No: 18 ( Marks: 2 )**

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Solve this quadratic equation:  $ax^2 + bx = 0$

**Question No: 19 ( Marks: 3 )**

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Find  $\frac{dy}{dx}$  if  $x^3 + y^3 = 4$

**Question No: 20 ( Marks: 5 )**

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Find an equation of the line through A (-6, 5) having slope 7.

**Question No: 21 ( Marks: 10 )**

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Show that the points A(0,2) ; B( $\sqrt{3}, -1$ ) ; C(0,-2) are vertices of right triangle.