## SRM INSTITUTE OF SCIENCE AND TECHNOLOGY RAMAPURAM CAMPUS DEPARTMENT OF MATHEMATICS SURPRISE TEST – 2

\* Required

**Answer ALL Questions** 

Each question carries ONE mark.

1. \*

If 
$$z = x^2 + y^2 + 3xy$$
 then  $\frac{\partial z}{\partial x} =$ 

(A) 2y + 3x (B) 3y (C) 2x + 3y (D) 2x

- ( A
- B
- O

If u is a homogeneous function of degree n then

$$x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} =$$

- (A)n (B) nu (C)u (D)n<sup>2</sup>u
- ( ) A
- B
- $\bigcirc$  C
- $\bigcirc$  D

3. \*

$$u = \sin^{-1} \left( \frac{x^2 + y^2}{x - y} \right)$$
 is a homogeneous function of

degree

- (A) 2 (B) 3 (C) 1 (D) 4
- A
- B
- ( ) C
- O D

4. *	
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The stationary point of  $f(x, y) = x^2 + y^2 + 6x + 12$  is

- (A)(-3,0) (B)(0,3) (C)(0,-3) (D)(3,0)

5. \*

A point at which there is no extreme value is called

- (A) maximum point (B) minimum point
- (C) saddle point
- (D) dual point

- ( ) D

If  $r = f_{xx}$ ,  $s = f_{xy}$ ,  $t = f_{yy}$  then the condition for a function f(x, y) to have a maximum value is

- (A)  $rt s^2 > 0$ , r > 0 or t > 0 (B)  $rt s^2 < 0$
- (C)  $rt s^2 > 0$ , r < 0 or t < 0 (D)  $rt s^2 = 0$ , r > 0

- D

7. \*

If f(x, y) is an implicit function then  $\frac{dy}{dx} =$ 

$$(A) - \frac{\left(\frac{\partial f}{\partial x}\right)}{\left(\frac{\partial f}{\partial y}\right)} \quad (B) \quad \frac{\left(\frac{\partial f}{\partial x}\right)}{\left(\frac{\partial f}{\partial y}\right)} \quad (C) \quad \frac{\left(\frac{\partial f}{\partial y}\right)}{\left(\frac{\partial f}{\partial x}\right)} \quad (D) \quad - \frac{\left(\frac{\partial f}{\partial y}\right)}{\left(\frac{\partial f}{\partial x}\right)}$$

If  $f(x, y) = e^x \cos y$  then  $f_{xy}(0,0) =$ 

- (A) 0 (B) -1 (C) 2 (D) 1
- A
- ( E
- $\bigcirc$  0
- O D

9. \*

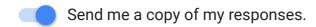
If  $J_1 = J\left(\frac{x,y}{u,v}\right)$  and  $J_2 = J\left(\frac{u,v}{x,y}\right)$  then  $J_1J_2 = J\left(\frac{u,v}{x,y}\right)$ 

- (A) 0 (B) -1 (C) 2 (D) 1
- ( A
- B
- $\bigcirc$  c
- 0

If  $x = r \cos \theta$  and  $y = r \sin \theta$  then  $\frac{\partial(x, y)}{\partial(r, \theta)} =$ 

(A)r (B) r<sup>2</sup> (C) 2r (D) 1/r

- A
- ( ) B
- $\bigcirc$



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