

MTH301-Calculus-II
Mid TERM Solved MCQS
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Question No: 1

Every point in three dimensional space can be described by-----coordinates.

- ▶ Two
- ▶ **Three**
- ▶ Four
- ▶ Eight

Question No: 2

What are the direction cosines for the line joining the points (1, 3, 2) and (7, -2, 3)?

- ▶ $\frac{1}{7}, \frac{-3}{2}$ and $\frac{2}{3}$
- ▶ $\frac{7}{11}, \frac{-6}{11}$ and $\frac{6}{11}$
- ▶ $\frac{8}{3\sqrt{10}}, \frac{1}{3\sqrt{10}}$ and $\frac{5}{3\sqrt{10}}$
- ▶ $\frac{6}{\sqrt{62}}, \frac{-5}{\sqrt{62}}$ and $\frac{1}{\sqrt{62}}$

Question No: 3

The angles which a line makes with positive x ,y and z-axis are known as -----

- ▶ Direction cosines
- ▶ Direction ratios
- ▶ **Direction angles**

Question No: 4

Which of the following is geometrical representation of the equation $y = 4$, in three dimensional space?

- ▶ **A point on y-axis (Farhan)**
- ▶ Plane parallel to xy-plane
- ▶ Plane parallel to yz-axis
- ▶ **Plane parallel to xz-plane (Ali)**

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Question No: 5

Domain of the function $f(x, y, z) = \sqrt{x^2 + y^2 + z^2}$ is

- ▶ Entire 3D-Space
- ▶ Entire 3D-Space except origin
- ▶ $(0, 0, 0)$
- ▶ $(-\infty, \infty)$

Question No: 6

If $f(x, y) = x^2y - y^3 + \ln x$

then $\frac{\partial^2 f}{\partial x^2} =$

- ▶ $2xy + \frac{1}{x^2}$
- ▶ $2y + \frac{1}{x^2}$
- ▶ $2xy - \frac{1}{x^2}$
- ▶ $2y - \frac{1}{x^2}$

Question No: 7

Suppose $f(x, y) = xy - 2y^2$ where $x = 3t + 1$ and $y = 2t$. Which one of the following is true?

▶ $\frac{df}{dt} = -4t + 2$

▶ $\frac{df}{dt} = -16t - t$

▶ $\frac{df}{dt} = 18t + 2$

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► $\frac{df}{dt} = -10t^2 + 8t + 1$

Question No: 8

For a function $f(x, y, z)$, the equation $\frac{\partial^2 f}{\partial x^2} + \frac{\partial^2 f}{\partial y^2} + \frac{\partial^2 f}{\partial z^2} = 0$ is known as -----

► Gauss Equation

► Euler's equation

► **Laplace's Equation**

► Stoke's Equation

Question No: 9

Magnitude of vector $\vec{a}$ is 2, magnitude of vector $\vec{b}$ is 3 and angle between them when placed tail to tail is 45 degrees. What is $|\vec{a} + \vec{b}|$?

► 4.5

► 6.2

► 5.1

► **4.2**

Question No: 10

Is the function $f(x, y)$ continuous at origin? If not, why?



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$$f(x, y) = \frac{xy}{x^2 + y^2}$$

► $f(x, y)$ is continuous at origin

► $\lim_{(x, y) \rightarrow (0, 0)} f(x, y)$ does not exist

► $f(0, 0)$ is defined and $\lim_{(x, y) \rightarrow (0, 0)} f(x, y)$ exists but these two numbers are not equal.

Question No: 11

Let R be a closed region in two dimensional space. What does the double integral over R calculates?

► Area of R.??(ali)

► Radius of inscribed circle in R

► Distance between two endpoints of R.

► None of these

Question No: 12

Which of the following formula can be used to find the Volume of a parallelepiped with adjacent edges formed by the vectors a , b and c ?

► $\begin{vmatrix} a & b & c \end{vmatrix}$

► $\begin{vmatrix} a & b & c \end{vmatrix}$

► $\begin{vmatrix} a & b & c \end{vmatrix}$

► $\begin{vmatrix} a & b & c \end{vmatrix}$

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Question No: 13

Two surfaces are said to be orthogonal at a point of their intersection if their normals at that point are -----

- ▶ Parallel
- ▶ **Perpendicular**
- ▶ In opposite direction

Question No: 14

Two surfaces are said to intersect orthogonally if their normals at every point common to them are -----

- ▶ perpendicular
- ▶ parallel
- ▶ **In opposite direction**

Question No: 15

Let the function $f(x, y)$ has continuous second-order partial derivatives

$(f_{xx}, f_{yy} \text{ and } f_{xy})$ in some circle centered at a critical point (x_0, y_0) and let

$$D = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = f_{xx} f_{yy} - f_{xy}^2$$

If $D > 0$ and $f_{xx}(x_0, y_0) < 0$ then f has -----

▶ **Relative maximum at (x_0, y_0)**

▶ Relative minimum at (x_0, y_0)

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- ▶ Saddle point at (x_0, y_0)
- ▶ No conclusion can be drawn.

Question No: 16

Let the function $f(x, y)$ has continuous second-order partial derivatives

$(f_{xx}, f_{yy} \text{ and } f_{xy})$ in some circle centered at a critical point (x_0, y_0) and let

$$D = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} \begin{vmatrix} x & y \\ x & y \end{vmatrix} - f^2 \begin{vmatrix} x & y \\ x & y \end{vmatrix}$$

If $D = 0$ then -----

- ▶ f has relative maximum at (x_0, y_0)
- ▶ f has relative minimum at (x_0, y_0)
- ▶ f has saddle point at (x_0, y_0)
- ▶ **No conclusion can be drawn.**

Question No: 17

If $R = \{(x, y) / 0 \leq x \leq 2 \text{ and } 1 \leq y \leq 4\}$, then

$$\iint_R (6x^2 + 4xy^3) dA =$$

$$\int_1^4 \int_0^2 (6x^2 + 4xy^3) dy dx$$

$$\int_0^2 \int_1^4 (6x^2 + 4xy^3) dx dy$$

$$\int_1^4 \int_0^2 (6x^2 + 4xy^3) dx dy$$

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$$\int_2^4 \int_0^1 (6x^2 + 4xy^3) dx dy$$

Question No: 18

If $R = \{(x, y) / 0 \leq x \leq 2 \text{ and } -1 \leq y \leq 1\}$, then

$$\iint_R (x + 2y^2) dA =$$

$$\int_{-1}^1 \int_0^2 (x + 2y^2) dy dx$$

$$\int_0^2 \int_{-1}^1 (x + 2y^2) dx dy$$

$$\int_{-1}^1 \int_0^2 (x + 2y^2) dx dy$$

$$\int_1^2 \int_{-1}^0 (x + 2y^2) dx dy$$

Question No: 19

If $R = \{(x, y) / 2 \leq x \leq 4 \text{ and } 0 \leq y \leq 1\}$, then

$$\iint_R (4xe^{2y}) dA =$$

$$\int_0^1 \int_2^4 (4xe^{2y}) dy dx$$

$$\int_0^2 \int_2^4 (4xe^{2y}) dx dy$$

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$$\int_1^4 \int_0^2 (4xe^{2y}) dx dy$$

$$\int_1^4 \int_0^2 (4xe^{2y}) dy dx$$

Question No: 20

If $R = \{(x, y) / 0 \leq x \leq 4 \text{ and } 0 \leq y \leq 9\}$, then

$$\int_R (3x - 4x\sqrt{y}) dA =$$

$$\int_0^9 \int_0^4 (3x - 4x\sqrt{y}) dy dx$$

$$\int_0^4 \int_0^9 (3x - 4x\sqrt{y}) dx dy$$

$$\int_4^9 \int_0^4 (3x - 4x\sqrt{y}) dx dy$$

$$\int_0^4 \int_0^9 (3x - 4x\sqrt{y}) dy dx$$



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1. Every real number corresponds to _____ on the co-ordinate line.

- Infinite number of points
- Two points (one positive and one negative)
- A unique point??
- None of these

2. There is one-to-one correspondence between the set of points on co-ordinate line and _____.

- Set of real numbers
- Set of integers
- Set of natural numbers
- Set of rational numbers

3. Which of the following is associated to each point of three dimensional spaces?

- A real number
- An ordered pair
- An ordered triple
- A natural Number

4. All axes are positive in _____ octant.

- First
- Second
- Fourth
- Eighth

5. The spherical co-ordinates of a point are $(\sqrt{3}, \frac{\pi}{3}, \frac{\pi}{2})$. What are its cylindrical co-ordinates?

- $(\sqrt{3}, 3, 0)$
- $(2, 2, 0)$
- $(\sqrt{3}\cos\frac{\pi}{3}, \sqrt{3}\sin\frac{\pi}{3}, 0)$

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$$\left(\sqrt{3} \sin \frac{\pi}{3}, -\frac{\pi}{2}, \sqrt{3} \cos \frac{\pi}{3} \right)$$

$$\left(\sqrt{3}, \frac{\pi}{3}, 0 \right)$$

6. Suppose $f(x, y) = xy - 2y^2$ where $x = 3t + 1$ and $y = 2t$. Which one of the following is true?

$$\begin{aligned} & \Rightarrow -4t + 2 \\ & \frac{df}{dt} = -16t - 2 \\ & = 1, 8 + 2 \\ & \frac{df}{dt} = -10t^2 + 8t + 1 \end{aligned}$$

$$\frac{df}{dt}$$

$$\frac{df}{dt}$$

7. Let $w = f(x, y, z)$ and $x = g(r, s)$, $y = h(r, s)$, $z = t(r, s)$ then by chain rule $\frac{\partial w}{\partial r} =$

$$\frac{\partial w}{\partial x} \frac{\partial x}{\partial r} + \frac{\partial w}{\partial y} \frac{\partial y}{\partial r} + \frac{\partial w}{\partial z} \frac{\partial z}{\partial r}$$

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- $\frac{6w \ 6x}{6r \ 6r} + \frac{6w \ 6y}{6r \ 6r} + \frac{6w \ 6z}{6r \ 6r}$
- $\frac{6w \ 6x \ 6x}{6x \ 6r \ 6s} + \frac{6w \ 6y \ 6y}{6y \ 6r \ 6s} + \frac{6w \ 6z \ 6z}{6z \ 6r \ 6s}$
- $\frac{6w \ 6r}{6r \ 6x} + \frac{6w \ 6r}{6r \ 6y} + \frac{6w \ 6r}{6r \ 6z}$

8. Magnitude of vector $\vec{a}$ is 2, magnitude of vector $\vec{b}$ is 3 and angle between them when placed tail to tail is 45 degrees. What is $\vec{a} \cdot \vec{b}$?

- 4.5
- 6.2
- 5.1
- **4.2**

9. Is the function $f(x, y)$ continuous at origin? If not, why?

$$f(x, y) = \begin{cases} 0 & \text{if } x \geq 0 \text{ and } y \geq 0 \\ \end{cases}$$

- **$f(x, y)$ is continuous at origin**
- $f(0, 0)$ is not defined
- $f(0, 0)$ is defined but $\lim_{(x, y) \rightarrow (0, 0)} f(x, y)$ does not exist
- $f(0, 0)$ is defined and $\lim_{(x, y) \rightarrow (0, 0)} f(x, y)$ exist but these two numbers are not equal.

10. Is the function $f(x, y)$ continuous at origin? If not, Why?

$$f(x, y) = \begin{cases} \frac{3x^2y}{x^2+y^2} & \text{if } (x, y) \neq (0, 0) \\ 0 & \text{if } (x, y) = (0, 0) \end{cases}$$

- $f(x, y)$ is continuous at origin
- **$f(0, 0)$ is not defined**
- $f(0, 0)$ is defined but $\lim_{(x, y) \rightarrow (0, 0)} f(x, y)$ does not exist

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- $f(0,0)$ is defined and $\lim_{(x,y) \rightarrow (0,0)} f(x,y)$ exist but these two numbers are not equal.

11. Let R be a closed region in two dimensional space. What does the double integral over R calculates?

- Area of R
- **Radius of inscribed circle in R.**
- Distance between two endpoints of R.
- None of these

12. Which of the following formula can be used to find the volume of a parallelepiped with adjacent edges formed by the vectors $\vec{a}$, $\vec{b}$ and $\vec{c}$?

- $|\vec{a} \times (\vec{b} \times \vec{c})|$
- $|\vec{a} \cdot (\vec{b} \cdot \vec{c})|$
- $|\vec{a} \cdot (\vec{b} \times \vec{c})|$
- $|\vec{a} \times (\vec{b} \cdot \vec{c})|$

13. Two surfaces are said to be orthogonal at a point of their intersection if their normals at that point are_____.

- Parallel
- **Perpendicular**
- In opposite direction
- Same direction

14. By Extreme Value Theorem, if a function $f(x,y)$ is continuous on a closed and bounded set R, then $f(x,y)$ has both _____ on R.

- **Absolute maximum and absolute minimum value**
- Relative maximum and relative minimum value
- Absolute maximum and relative minimum value
- Relative maximum and absolute minimum value

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15. Let the function $f(x, y)$ has continuous second-order partial derivatives

$(f_{xx}, f_{yy} \text{ and } f_{xy})$ in some circle centered at a critical point (x_0, y_0) and let

$$D = f_{xx}(x_0, y_0) f_{yy}(x_0, y_0) - f_{xy}^2(x_0, y_0) \text{ if}$$

$D > 0$ and $f_{xx}(x_0, y_0) < 0$ then f has _____.

- **Relative maximum at (x_0, y_0)**
- Relative minimum at (x_0, y_0)
- Saddle point at (x_0, y_0)
- No conclusion can be drawn.

16. Let the function $f(x, y)$ has continuous second-order partial derivatives

$(f_{xx}, f_{yy} \text{ and } f_{xy})$ in some circle centered at a critical point (x_0, y_0) and let

$$D = f_{xx}(x_0, y_0) f_{yy}(x_0, y_0) - f_{xy}^2(x_0, y_0) \text{ if}$$

if $D = 0$ then _____.

- f has relative maximum at (x_0, y_0)
- f has relative minimum at (x_0, y_0)
- f has saddle point at (x_0, y_0)
- **No conclusion can be drawn.**

17.1 If $R = R_1 \cup R_2$, where R_1 and R_2 are no over lapping regions then

$$\iint_{R_1} f(x, y) dA + \iint_{R_2} f(x, y) dA =$$

➤ $\iint_R f(x, y) dA$

➤ **$\iint_{R_1} f(x, y) dA + \iint_{R_2} f(x, y) dA$**

➤ $\iint_R f(x, y) dV$

➤ $\iint_R f(x, y) dV + \iint_{R_2} f(x, y) dA$

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18.1
8
.

If $R = \{(x, y) / 0 \leq x \leq 2 \text{ and } 1 \leq y \leq 4\}$, then $\iint_R (6x^2 + 4xy^3) dA =$

➤ $\int_0^2 \int_1^4 (6x^2 + 4xy^3) dy dx$

➤ $\int_0^2 \int_1^4 (6x^2 + 4xy^3) dy dx$

➤ $\int_0^2 \int_1^4 (6x^2 + 4xy^3) dy dx$

➤ $\int_0^2 \int_1^4 (6x^2 + 4xy^3) dy dx$

19.1
9
.

If $R = \{(x, y) / 2 \leq x \leq 4 \text{ and } 0 \leq y \leq 1\}$, then $\iint_R (4xe^{2y}) dA =$

➤ $\int_0^1 \int_2^4 (4xe^{2y}) dy dx$

➤ $\int_0^1 \int_2^4 (4xe^{2y}) dy dx$

➤ $\int_0^1 \int_2^4 (4xe^{2y}) dy dx$

➤ $\int_0^1 \int_2^4 (4xe^{2y}) dy dx$

20.2
0
.

If $R = \{(x, y) / 0 \leq x \leq 4 \text{ and } 0 \leq y \leq 9\}$, then $\iint_R (3x - 4x\sqrt{xy}) dA =$

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➤ $\int_0^9 \int_0^4 (3x - 4x\sqrt{y}) dy dx$

➤ $\int_0^9 \int_0^4 (3x - 4x\sqrt{y}) dx dy$

➤ $\int_4^9 \int_0^0 (3x - 4x\sqrt{y}) dx dy$

➤ $\int_0^9 \int_0^4 (3x - 4x\sqrt{y}) dy dx$

Question No: 1

Which of the following number is associated to each point on a co-ordinate line?

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

Question No: 2

If $a > 0$, then the parabola $y = ax^2 + bx + c$ opens in which of the following direction?

- ▶ Positive x - direction
- ▶ Negative x - direction
- ▶ Positive y - direction
- ▶ Negative y - direction

Question No: 3

Rectangular co-ordinate of a point is $(1, \sqrt{3}, -2)$. What is its spherical co-ordinate?

➤ $(2, 2, \frac{\pi}{2}, \frac{3\pi}{2})$

➤ $(2, 2, \frac{\pi}{2}, \frac{3\pi}{2})$

➤ $(2, 2, \frac{\pi}{2}, \frac{3\pi}{2})$

➤ $(2, \frac{\pi}{2}, \frac{3\pi}{2})$

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√
3 4

Question No: 4

If a function is not defined at some point, then its limit----- exist at that point.

▶ Always

▶ Never

▶ May

Question No: 5

Suppose $f(x, y) = x^3 e^{xy}$. Which one of the statements is correct?



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$$\frac{\partial f}{\partial x} = 3x^3 e^{xy}$$

☐ $\frac{\partial f}{\partial y} = 6y$

$$\frac{\partial f}{\partial x} = x^3 e^{xy}$$

☐ $\frac{\partial f}{\partial y} = 6y$

$$\frac{\partial f}{\partial x} = x^4 e^{xy}$$

☒ $\frac{\partial f}{\partial y} = 6y$

$$\frac{\partial f}{\partial x} = x^3 y e^{xy}$$

☐ $\frac{\partial f}{\partial y} = 6y$

Question No: 6

If $f(x, y) = x^2 y - y^3 + \ln x$

then $\frac{\partial^2 f}{\partial x^2} =$

☐ $2xy + \frac{1}{x^2}$

☒ $2y + \frac{1}{x^2}$

☐ $2xy - \frac{1}{x^2}$

☐ $2y - \frac{1}{x^2}$

Question No: 7

Suppose $f(x, y) = xy - 2y^2$ where $x = 3t + 1$ and $y = 2t$. Which one of the following is true?

☐ $\frac{df}{dt} = -4t + 2$

☐ $\frac{df}{dt} = -16t - t$

☐ $\frac{df}{dt} = -16t - t$

☒ $\frac{df}{dt} = 18t + 2$

☐ $\frac{df}{dt} = -10t^2 + 8t + 1$

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Question No: 8

Is the function $f(x, y)$ continuous at origin? If not, why?



$$f(x, y) = \begin{cases} 0 & \text{If } x \geq 0 \text{ and } y \geq 0 \\ 1 & \text{Otherwise} \end{cases}$$

$$f(x, y) = \begin{cases} 0 & \text{If } x \geq 0 \text{ and } y \geq 0 \\ 1 & \text{Otherwise} \end{cases}$$

$\lim_{(x,y) \rightarrow (0,0)} f(x,y)$ is defined but $\lim_{(x,y) \rightarrow (0,0)} \frac{f(x,y)}{f(x,y)}$ does not exist
 $\lim_{(x,y) \rightarrow (0,0)} f(x,y)$ is defined and $\lim_{(x,y) \rightarrow (0,0)} \frac{f(x,y)}{f(x,y)}$ exists but these two numbers are not equal.

What is the relation between the direction of gradient at any point on the surface to the tangent plane at that point ?

Question No: 10

Two surfaces are said to intersect orthogonally if their normals at every point common to them are -----

- ▶ perpendicular
- ▶ parallel
- ▶ in opposite direction

Question No: 11

By Extreme Value Theorem, if a function $f(x, y)$ is continuous on a closed and

bounded set R , then $f(x, y)$ has both ----- on R .

- ▶ Absolute maximum and absolute minimum value
- ▶ Relative maximum and relative minimum value

Question No: 12

Let the function $f(x, y)$ has continuous second-order partial derivatives

$(f_{xx}, f_{yy} \text{ and } f_{xy})$ in some circle centered at a critical point (x_0, y_0) and let

$$D = \begin{pmatrix} f_{xx} & 0 & 0 & f_{yy} & 0 & 0 & f_{xy} & 0 & 0 \end{pmatrix}$$

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If $D > 0$ and $f_{xx}(x_0, y_0) < 0$ then f has -----



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► **Relative maximum at (x_0, y_0)**

► Relative minimum at (x_0, y_0)

► Saddle point at (x_0, y_0)

► No conclusion can be drawn.

Question No: 13

Let the function $f(x, y)$ has continuous second-order partial derivatives

$(f_{xx}, f_{yy} \text{ and } f_{xy})$ in some circle centered at a critical point (x_0, y_0) and let

$$D = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} \begin{vmatrix} x & y \end{vmatrix} \begin{vmatrix} x & y \end{vmatrix} - f^2(x, y)$$

If $D = 0$ then -----

► f has relative maximum at (x_0, y_0)

► f has relative minimum at (x_0, y_0)

► f has saddle point at (x_0, y_0)

► **No conclusion can be drawn.**

Question No: 14

The function $f(x, y) = \sqrt{y-x}$ is continuous in the region ----- and discontinuous elsewhere.

► $x \leq y$

► $x \leq y$

► **$x > y$**

Question No: 15

Plane is an example of -----

► Curve

► **Surface**

► Sphere

► Cone

Question No: 16

If $R = R_1 \cup R_2$, where R_1 and R_2 are no overlapping regions then

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$$\iint_{R_1} f(x, y) dA = \iint_{R_2} f(x, y) dA$$

$$\iint_R f(x, y) dA$$

$$\iint_{R_1} f(x, y) dA = \iint_{R_2} f(x, y) dA$$

$$\iint_R f(x, y) dV$$

$$\iint_{R_1} f(x, y) dA = \iint_{R_2} f(x, y) dA$$

Question No: 17

If $R = \{(x, y) / 0 \leq x \leq 2 \text{ and } 1 \leq y \leq 4\}$, then

$$\iint_R (6x^2 + 4xy^3) dA =$$

$$\int_0^2 \int_1^4 (6x^2 + 4xy^3) dy dx$$

$$\int_1^4 \int_0^2 (6x^2 + 4xy^3) dx dy$$

$$\int_0^2 \int_4^1 (6x^2 + 4xy^3) dx dy$$

$$\int_1^4 \int_2^0 (6x^2 + 4xy^3) dx dy$$

$$\int_1^4 \int_0^2 (6x^2 + 4xy^3) dx dy$$

$$\int_0^2 \int_1^4 (6x^2 + 4xy^3) dx dy$$

$$\int_0^2 \int_4^1 (6x^2 + 4xy^3) dx dy$$

Question No: 18

If $R = \{(x, y) / 0 \leq x \leq 2 \text{ and } -1 \leq y \leq 1\}$, then

$$\iint_R (x + 2y^2) dA =$$

$$\int_{-1}^1 \int_0^2 (x + 2y^2) dy dx$$

$$\int_0^2 \int_{-1}^1 (x + 2y^2) dx dy$$

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$$\int_{-1}^1 \int_0^2 (x + 2y^2) dx dy$$

$$\int_2^0 \int_{-1}^1 (x + 2y^2) dx dy$$

$$\int_{-1}^1 \int_0^2 (x + 2y^2) dx dy$$

Question No: 19

If $R = \{(x, y) / 0 \leq x \leq 2 \text{ and } 0 \leq y \leq 3\}$, then

$$\int_R (1 - ye^{xy}) dA =$$

$$\int_0^2 \int_0^3 (1 - ye^{xy}) dy dx$$

$$\int_0^2 \int_0^3 (1 - ye^{xy}) dx dy$$

$$\int_0^2 \int_0^3 (1 - ye^{xy}) dx dy$$

$$\int_0^2 \int_0^3 (4xe^{2y}) dy dx$$

$$\int_0^2 \int_0^3 (1 - ye^{xy}) dy dx$$

$$\int_0^2 \int_0^3 (1 - ye^{xy}) dx dy$$

$$\int_0^2 \int_0^3 (1 - ye^{xy}) dy dx$$

$$\int_0^2 \int_0^3 (1 - ye^{xy}) dx dy$$

Question No: 20

If $R = \{(x, y) / 0 \leq x \leq 4 \text{ and } 0 \leq y \leq 9\}$, then

$$\int_R (3x - 4x\sqrt{xy}) dA =$$

$$\int_0^9 \int_0^4 (3x - 4x\sqrt{xy}) dy dx$$

$$\int_0^9 \int_0^4 (3x - 4x\sqrt{xy}) dx dy$$

$$\int_0^9 \int_0^4 (3x - 4x\sqrt{xy}) dx dy$$

$$\int_0^9 \int_0^4 (3x - 4x\sqrt{xy}) dy dx$$

$$\int_0^9 \int_0^4 (3x - 4x\sqrt{xy}) dx dy$$

$$\int_0^9 \int_0^4 (3x - 4x\sqrt{xy}) dy dx$$

$$\int_0^9 \int_0^4 (3x - 4x\sqrt{xy}) dx dy$$

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