

FBQ1: When the sequence of partial sums tends to an infinite limit, oscillates either finitely or infinitely the series is said to be ____
Answer: divergent

FBQ2: Both Taylor series and Maclaurin series only represent the function $f(x)$ in their interval of ____
Answer: Convergence

FBQ3: When functions are expanded at $x = a$, we have Taylor's expansion and when functions are expanded at $x = 0$ then we have ____ expansion
Answer: Maclaurin

FBQ4: By considering the hypothesis of mean value theorem, Given that $f(x) = x^2 + 2x + 1$ $a = 1$, $b = 2$
Answer: 4

FBQ5: By considering the hypothesis of mean value theorem, Given that $f(x) = x^2 + 2x + 1$ and $a = 1$, $b = 2$ find $f(b) =$ ____
Answer: 9

FBQ6: By considering the hypothesis of mean value theorem, Given that $f(x) = x^2 + 2x + 1$ and $a = 1$, $b = 2$ find $f'(c) =$ ____
Answer: 5

FBQ7: ____ rule is a technique for approximating the definite integral
Answer: Trapezoidal

FBQ8: ____ rule is an arithmetical rule for estimating the area under a curve where the values of an odd number of ordinates including those at each end.
Answer: Simpson's

FBQ9: The trapezoidal rule is also known as ____ rule
Answer: Trapezium

FBQ10: The $\frac{\partial^2 f}{\partial x \partial y}$ of the function $f(x, y) = 3x^2 - x^3y^3 + 5xy + 6y^3$ evaluate at the points $x = 1$ and $y = 2$ is ____
Answer: -31

FBQ11: The $\frac{\partial^2 f}{\partial y^2}$ of the function $f(x, y) = 3x^2 - x^3y^3 + 5xy + 6y^3$ evaluate at the points $x = 1$ and $y = 2$ is ____
Answer: 60

FBQ12: The $\lim_{x \rightarrow 2} x^2 - 2xx^2 - 4$ is ____
Answer: $\frac{1}{2}$

FBQ13: The $\lim_{x \rightarrow \infty} xx^3 + 5$ is ____
Answer: 0

FBQ14: If $f(x) = x(x^2 - x - 2)$ satisfies Mean Value Theorem, the value c is ____
Answer: $\frac{1}{3}$

FBQ15: The exponential form of the function $f(x) = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \dots$ is ____
Answer: $\exp x$

FBQ16: Find the limit of $\lim_{(x, y) \rightarrow (2, 1)} x + 3y^2$ is ____
Answer: 5

FBQ17: Find the limit of $\lim_{(x, y) \rightarrow (2, 4)} \frac{x+y}{x-y}$ is ____
Answer: -3

FBQ18: Find limit $\lim_{(x, y, z) \rightarrow (1, 2, 5)} \sqrt{x+y+z}$ is ____

Answer: 3

FBQ19: The coefficient of x^2 in the Taylor series about $x=0$ for $f(x)=e^{-x^2}$ is _____

Answer: -1

FBQ20: The coefficient of x^3 in the Taylor series about $x=0$ for $f(x)=\sin 2x$ is _____

Answer: $-4/3$

FBQ21: Let $f(x)=\frac{\sin x}{1+x^2}$ and y^n denote the n^{th} derivative of $f(x)$ at $x=0$ then the value of $y^{100}+900y^{98}$ is _____

Answer: 0

FBQ22: If the first derivative at $x=0$ of the function $f(x)=\frac{\cos(x)}{x^2-x+1}$ is _____

Answer: 2

FBQ23: Given $f(x,y)=2x^2y$, the value $\frac{\partial f(x,y)}{\partial x}$ at $x=2$ and $y=4$ is _____

Answer: 24

FBQ23: .Given that the function $f(x)=\frac{2(x+3)}{x^2+x-2}$ has an absolute maximum on the $-2 \leq x \leq 4$. The maximum value is _____

Answer: 2

FBQ25: The points of inflection of the function $f(x)=x^4-12x^3+6x-9$ on the interval $-2 \leq x \leq 10$ are _____ and _____

Answer: 0, 6

FBQ26: The value of a such that the function $f(x)=x^2+ax+5$, when $f(2)=15$ is _____

Answer: 3

FBQ27: If $x^2+y^2-2x-6y+5=0$, the value $\frac{d^2y}{dx^2}$ at $x=3, y=2$ is _____

Answer: 5

FBQ28: If the Mean Value Theorem satisfies $fx=x^2$ on the interval $-2, 1$, then the value of c is _____

Answer: $-1/5$

FBQ29: The minimum value of $f(x,y)=x^2+y^2+6x+12$ is _____

Answer: 3

FBQ30: Suppose $w=x^3yz+xy+z+3$ and $x=3\cos t, y=3\sin t$ and $w=2t$. The value $\frac{dw}{dt}=\pi^2$ is _____

Answer: 7

FBQ31: Let $f(x)=\frac{e^x \sin(x^2)}{x}$, then the value of the fifth derivative at $x=0$ is _____

Answer: 21

FBQ32: Leibniz rule gives the N^{th} derivative of multiplication of _____ functions

Answer: Two

FBQ33: Leibniz theorem is applicable if n is a _____ integer

Answer: Positive

FBQ34: If n^{th} derivative of $xy_3+x^2y_2+x^3y_0=0$ then order of its n^{th} differential equation is _____

Answer: $n+3$

FBQ35: For the function $f(x) = \frac{\sin x}{x^2}$. _____ are the number of points exist in the interval $[0, 7\pi]$ such that $f'(c) = 0$
Answer: True

FBQ36: $f(x) = \frac{\sin x}{x}$. _____ are the number of points exist in the interval $[0, 18\pi]$ such that $f'(c) = 0$
Answer: 18

FBQ37: For all second degree polynomials with $y = ax^2 + bx + k$, it is seen that the Rolles' point is at $c = 0$. Also the value of k is zero. Then the value of b is _____
Answer: 0

FBQ38: For second degree polynomial it is seen that the roots are equal. Then _____ is the relation between the Rolles point c and the root x
Answer: $c=x$

FBQ39: Rolle's Theorem is a special case of _____ theorem
Answer: Mean value

FBQ40: The value of c if $f(x) = x(x-3)e^{3x}$, is continuous over interval $[0, 3]$ and differentiable over interval $(0, 3)$ _____ (Answer to 3 decimal)
Answer: 2.703

FBQ41: The value of 'a' are _____ and _____, if $f(x) = ax^2 + 32x + 4$ is continuous over $[-4, 0]$ and differentiable over $(-4, 0)$ and satisfy the Rolle's theorem. Hence find the point in interval $(-2, 0)$ at which its slope of a tangent is zero
Answer: 8, -2

FBQ42: For the function $f(x) = x^2 - 2x + 1$. We have Rolles point at $x = 1$. The coordinate axes are then rotated by 45 degrees in anticlockwise sense. What is the position of new Rolles point with respect to the transformed coordinate axes _____
Answer: $3/2$

FBQ43: If $f(a) = f(b)$ in mean value theorem, then it becomes _____ theorem
Answer: Rolle's

FBQ44: Mean Value theorem is applicable to the functions continuous in closed interval $[a, b]$ and _____ in open interval (a, b)
Answer: Differentiable

FBQ45: Mean Value theorem is also known as _____ theorem
Answer: Lagrange's

FBQ46: The point c is _____ in the curve $f(x) = x^3 + x^2 + x + 1$ in the interval $[0, 1]$ where slope of a tangent to a curve is equals to the slope of a line joining $(0, 1)$
Answer: 0.54

FBQ47: _____ is the point c between $[2, 9]$ where, the slope of tangent to the function $f(x) = 1 + \sqrt[3]{x} - 1$ at point c is equals to the slope of a line joining point $(2, f(2))$ and $(9, f(9))$. (Providing given function is continuous and differentiable in given interval).
Answer: 4.56

FBQ48: _____ is the point c between $[-1, 6]$ where, the slope of tangent to the function $f(x) = x^2 + 3x + 2$ at point c is equals to the slope of a line joining point $(-1, f(-1))$ and $(6, f(6))$. (Providing given function is continuous and differentiable in given interval).
Answer: 2.5

FBQ49: The necessary condition for the maclaurin expansion to be true for

function $f(x)$ is $f(x)$ should be continuous and _____

Answer: Differentiable

FBQ50: The limit $\lim_{(x, y) \rightarrow (0, 0)} \frac{x^3 - y^3}{x - y}$ is

Answer: 0

MCQ1: A single valued function of x is said to be continuous at $x=a$ if

Answer: $\lim_{x \rightarrow a} f(x) = f(a)$

MCQ2: Which of the following is discontinuous at $x = 0$

Answer: $\sin xx$

MCQ3: A function $y = f(x)$ is said to be differentiable at a point $x = a$ if

Answer: $f'(x)$ exists at that point

MCQ4: Find the derivative of $y = \sin^{-1}x$

Answer: $\frac{1}{\sqrt{1-x^2}}$

MCQ5: Suppose $u = f(x, y) = x^2 + y^2$, where $x = \cosh 4t$ and $y = 2t + t^2$. Find the total derivative of u with respect to t

Answer: $4\sinh 8t + 8t + 12t^2 + 4t^3$

MCQ6: If $f(u) = \sin u$ and $u = x^2 + y^2$ find f_x

Answer: $\cos u \cdot 2x$

MCQ7: If $f(u) = \sin u$ and $u = x^2 + y^2$ find f_y

Answer: $\cos u \cdot 2y$

MCQ8: Partial derivatives are said to be continuous if

Answer: they are continuous

MCQ9: Obtain the slope of the tangent at the point $(2,3)$ of the curve $6x^2 + 3xy + x^4 + 3y^2 = 0$

Answer: $-\frac{65}{24}$

MCQ10: A function $f(x, y)$ of two variables is said to have a local maximum at (a, b) if there exists a rectangular region containing (a, b) such that _____

Answer: $f(x, y) \leq f(a, b)$

MCQ11: The local maxima and minima are called the _____ of (x, y)

Answer: extreme

MCQ12: To test for critical point if $f_{xx}f_{yy} - f_{xy}^2 < 0$ then this gives

Answer: saddle point

MCQ13: Obtain the stationary points of $f(x, y) = x^2 + y^2$ subject to the constraint condition $3x + 2y = 6$

Answer: $(1, 1.5), (2, 0)$

MCQ14: A function $f(x, y)$ is said to be homogeneous of degree m if

Answer: $f(kx, ky) = k^m f(x, y)$

MCQ15: What is the degree of the function $f(x, y) = x^3 + 4xy^2 - 3y^3$

Answer: three

MCQ16: If x and y are rectangular Cartesian coordinates, $u = f(x, y)$ satisfies Laplace's equation if

Answer: $\frac{\partial^2 f}{\partial x^2} + \frac{\partial^2 f}{\partial y^2} = 0$

MCQ17: A function $f(x, y)$ is said to have a maximum value at point $(x, y) = (a, b)$ if

Answer: $f(a+h, b+k) - f(a, b) < 0$

MCQ18: A function $f(x, y)$ is said to have a minimum value of point (x, y) if
Answer: $f(a+h, b+k) - f(a, b) > 0$

MCQ19: If $xy + x + y = 1$, evaluate $\frac{dy}{dx}$ at $(0, 0)$
Answer: -1

MCQ20: If $xy + \sin y = 2$ find $\frac{dy}{dx}$
Answer: $-y \sec^2 y$

MCQ21: If $z = \sin(x+y)$, $x = u^2 + v^2$, $y = 2uv$. Evaluate $\frac{dz}{du}$
Answer: $2(u+v) \cos(x+y)$

MCQ22: With the usual notation a series cannot be convergent unless
Answer: $\lim_{n \rightarrow \infty} U_n = 0$

MCQ23: Let $U_1 + U_2 + \dots + U_n + \dots$ be a series of positive terms. If $\lim_{n \rightarrow \infty} \frac{U_{n+1}}{U_n} > 1$. Then the series
Answer: Diverges

MCQ24: As $n \rightarrow \infty$ of the series $1 + 2 + 3 + 4 + \dots$ is
Answer: divergent

MCQ25: For the series $1^2 + 2^3 + 3^4 + 4^5 + \dots$ an expression of U_{n+1} is given by
Answer: $(n+1)^{n+2}$

MCQ26: By considering the D' Alembert test for positive terms if $\lim_{n \rightarrow \infty} \frac{U_{n+1}}{U_n} = 1$, then the series is
Answer: inconclusive

MCQ27: By the comparison test, the series $1^p + 2^p + 3^p + 4^p + \dots + n^p + \dots$ _____
if $p > 1$
Answer: converges

MCQ28: Find $\lim_{x \rightarrow 0} \frac{\sin 2x}{x^2}$
Answer: 2

MCQ29: Evaluate $\lim_{x \rightarrow 0} \frac{\sinh x - \sin x}{x^3}$
Answer: $1/3$

MCQ30: The Taylor's series is given by
Answer: $f(x+h) = f(x) + hf'(x) + \frac{h^2}{2!} f''(x) + \dots$

MCQ31: Find $\lim_{x \rightarrow 0} \frac{\tan x - x}{x^3}$
Answer: $1/3$

MCQ32: Determine $\lim_{x \rightarrow 1} \frac{x^3 - 2x^2 + 4x - 3}{x^2 - 5x + 1}$
Answer: 1

MCQ33: Find the second order derivatives of the function. $f(x) = x^2 - \cos x$ at $x = \pi/4$
Answer: $2 + \frac{1}{\sqrt{2}}$

MCQ34: Find the third order derivatives of the function. $f(x) = x^2 - \cos x$ at $x = \pi/4$
Answer: $-\frac{1}{\sqrt{2}}$

MCQ35: $\lim_{x \rightarrow 0} \frac{\tan x - x \sin x}{x^3}$ is
Answer: -2

MCQ36: From the Taylor's expansion of $\cos \pi/3 + x$ in ascending powers of x up to the x^3 term find $f'''(\pi/3)$
Answer: $-3/2$

MCQ37: From the Taylor's expansion of $\cos \pi/3 + x$ in ascending powers of x up to the x^3 term find $f'''(x)$
Answer: $-\cos x$

MCQ38: From the Taylor's expansion of $\cos \pi^3 + x$ in ascending powers of x up to the x^3 term find $f_{1v} \pi^3$

Answer: $\frac{1}{2}$

MCQ39: From the Taylor's expansion of $\cos \pi^3 + x$ in ascending powers of x up to the x^3 term find $f_{1v} x$

Answer: $\cos x$

MCQ40: Suppose f_x is a function continuous on a close interval $a \leq x \leq b$ and differentiable on the open interval $a < x < b$ and if $f_a = f_b = 0$, then f_{1c}

Answer: 0

MCQ41: From the Maclaurin expansion $f_x = \ln(1+x)$ find $f_{111}x$

Answer: $21+x^3$

MCQ42: From the Maclaurin expansion $f_x = \ln(1+x)$ find $f_{1v}x$

Answer: $-6(1+x)^4$

MCQ43: From the Maclaurin expansion $f_x = \ln(1+x)$ find $f_{11}0$

Answer: -1

MCQ44: From the Maclaurin expansion $f_x = \ln(1+x)$ find f_{v0}

Answer: 4!

MCQ45: Using Simpson's rule with 6 equally spaced intervals and by considering the integral $\int_0^6 4+x^3 dx$. Find The number of ordinates

Answer: 7

MCQ46: Using Simpson's rule with 6 equally spaced intervals and by considering the integral $\int_0^6 4+x^3 dx$. Find $\Delta x = \text{strip width}$

Answer: 1

MCQ47: Using Simpson's rule with 6 equally spaced intervals and by considering the integral $\int_0^6 4+x^3 dx$. Find Area

Answer: 22.6 square units

MCQ48: The two segment trapezoidal rule of integration is exact for integrating at most ____ order of polynomial

Answer: first

MCQ49: Using trapezoidal rule with five (5) equally spaced intervals and by considering the integral. $\int_1^2 \frac{1}{x} dx$. Evaluate b-an

Answer: $\frac{1}{5}$

MCQ50: Using trapezoidal rule with five (5) equally spaced intervals and by considering the integral. $\int_1^2 \frac{1}{x} dx$, evaluate the area of the integral

Answer: 17532520