B.Tech. Branch: CSE, SEM-III, CT-III, Mathematics-III, Date: 19-12-21, Time: 9 am to 10 am

Hi, Gargi. When you submit this form, the owner will see your name and email address.

1. The solution of the differential equation
(1 Point)

$\frac{dy}{dx} = \frac{y}{x}$ *is*

- ○ $y = cx^2$
- ◉ $y = cx$
- ○ $y^2 = cx$
- ○ $y = \frac{c}{x}$

2. Taylor's series of the function f(z) is denoted by
(1 Point)

- ○ $f(z) = -\sum_{n=0}^{\infty} a_n (z-a)^n$
- ○ $f(z) = \sum_{n=0}^{\infty} a_n (z-a)^{-n}$
- ○ *None of these*
- ◉ $f(z) = \sum_{n=0}^{\infty} a_n (z-a)^n$

3. The poles of the following function
(1 Point)

$f(z) = \frac{z^2}{(z-1)(z-2)^2}$ *are*

- ○ $z = 1$ *is double pole and* $z = 2$ *is simple pole*
- ◉ $z = 1$ *is simple pole and* $z = 2$ *is double pole*
- ○ $z = -1$ *is simple pole and* $z = 2$ *is double pole*
- ○ $z = 1$ *is simple pole and* $z = -2$ *is double pole*

4. The zero of the function
(1 Point)

$f(z) = \frac{z-2}{z^2}\sin\left(\frac{1}{z-1}\right)$ *is*

- ○ $z = -2,$ *and* $1 + \frac{1}{n\pi}$
- ○ $z = 2,$ *and* $2 + \frac{1}{n\pi}$
- ○ $z = 2,$ *and* $1 - \frac{1}{n\pi}$
- ◉ $z = 2,$ *and* $1 + \frac{1}{n\pi}$

5. P.I. of the following equation
(1 Point)

$(D^2 - 3D + 2)\, y = e^{5x}$ *is*

- ◉ $\frac{1}{12}e^{5x}$
- ○ $\frac{1}{11}e^{5x}$
- ○ $\frac{1}{15}e^{5x}$
- ○ $\frac{1}{17}e^{5x}$

6. The degree of the differential equation
(1 Point)

$\frac{dy}{dx} = \frac{1+x}{1-y}$ *is*

- ○ 2
- ○ 3
- ○ *None of these*
- ◉ 1

7. CR -equations are
(1 Point)

- ○ $u_x = -v_y$ *and* $u_y = -v_x$
- ○ $u_x = -v_y$ *and* $u_y = v_x$
- ○ $u_x = v_y$ *and* $u_y = v_x$
- ◉ $u_x = v_y$ *and* $u_y = -v_x$

8. Solution of the following equation
(1 Point)

$x = y + p^2$ *is*

- ◉ $x = c + [2p + 2\log(p-1)]$
- ○ $x = c - [2p + 2\log(p+1)]$
- ○ $x = c - [2p - 2\log(p-1)]$
- ○ $x = c - [2p + 2\log(p-1)]$

9. Essential singularity is
(1 Point)

- ○ *None of these*
- ○ *All $b_n's$ are zero*
- ◉ *Infinite terms in P. P.*
- ○ *Finite terms in P. P.*

10. Radius of convergence of power series is
(1 Point)

- ◉ $\frac{1}{R} = \lim_{n=\infty} |a_n|^{\frac{1}{n}}$
- ○ $\frac{1}{R} = \lim_{n=0} |a_n|^{\frac{1}{n}}$
- ○ *None of these*
- ○ $\frac{1}{R} = -\lim_{n=\infty} |a_n|^{\frac{1}{n}}$

11. Laurent's series of the function f(z) is denoted by
(1 Point)

- ◉ $f(z) = \sum_{n=0}^{\infty} a_n (z-a)^n + \sum_{n=1}^{\infty} b_n (z-a)^{-n}$
- ○ $f(z) = \sum_{n=0}^{\infty} a_n (z-a)^{-n} + \sum_{n=1}^{\infty} b_n (z-a)^{-n}$
- ○ $f(z) = \sum_{n=0}^{\infty} a_n (z-a)^{-n} + \sum_{n=1}^{\infty} b_n (z-a)^{n}$
- ○ $f(z) = \sum_{n=0}^{\infty} a_n (z-a)^{n} + \sum_{n=1}^{\infty} b_n (z-a)^{n}$

12. Residue of the function
(1 Point)

$f(z) = \frac{z^2}{(z-1)^2(z+2)}$ *at* $z = -2$ *is*

- ○ $\frac{7}{11}$
- ○ $\frac{4}{7}$
- ◉ $\frac{4}{9}$
- ○ $\frac{5}{9}$

13. The general solution of the following differential equation
(1 Point)

$x\frac{dy}{dx} + 2y = 3$ *is*

- ○ $y = \frac{3}{2} - \frac{c}{x^2}$
- ◉ $y = \frac{3}{2} + \frac{c}{x^2}$
- ○ *None of these*
- ○ $y = \frac{3}{2} + \frac{c}{x}$

14. P.I. of the equation
(1 Point)

$(D^2 - 4D + 3)\, y = e^{2x} \sin 3x$ *is*

- ◉ $-\frac{1}{10}e^{2x} \sin 3x$
- ○ $-\frac{1}{10}e^{-2x} \sin 3x$
- ○ $\frac{1}{10}e^{2x} \sin 3x$
- ○ *None of these*

15. Derivatives of analytic function f(z) is
(1 Point)

- ◉ $u_x = -iv_x$

- ○ $u_x = -\frac{1}{2}iv_x$
- ○ $u_x = iv_x$
- ○ $u_x = \frac{1}{2}iv_x$

16. If f(z) is simple pole of order 1 at z = a, then
(1 Point)

- ○ $Res.[f(z)] = Lt_{z=a}(z-a)f(z)$
- ○ $Res.[f(z)] = Lt_{z=-a}(z-a)f(z)$
- ○ $Res.[f(z)] = Lt_{z=\infty}(z-a)f(z)$
- ◉ *None of these*

17. The poles of the following function
(1 Point)

$f(z) = \frac{z^3}{(z-1)^4(z-2)(z-3)}$ *are*

- ○ $1, 2, -3$
- ○ $1, -2, 3$
- ◉ $1, 2, 3$
- ○ $-1, 2, 3$

18. Solution of the differential equation
(1 Point)

$\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = 0$ *is*

- ◉ $y = c_1e^{-x} + c_2e^{-2x}$
- ○ $y = c_1e^{x} + c_2e^{-2x}$

- ○ $y = c_1 e^{-x} + c_2 e^{2x}$
- ○ $y = c_1 e^{-x} - c_2 e^{-2x}$

19. Radius of convergence of the series
(1 Point)

$\sum_{n=0}^{\infty} \frac{z^n}{n^n}$ *is*

- ○ $-\infty$
- ○ π
- ○ e
- ◉ ∞

20. C.F. of the following differential equation
(1 Point)

$9\frac{d^2x}{dz^2} + 18\frac{dx}{dz} - 16x = 0$

- ◉ $x = c_1 e^{\frac{2}{3}z} + c_2 e^{-\frac{8}{3}z}$
- ○ *None of these*
- ○ $x = c_1 e^{-\frac{2}{3}z} + c_2 e^{-\frac{8}{3}z}$
- ○ $x = c_1 e^{\frac{2}{3}z} + c_2 e^{\frac{8}{3}z}$

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