

Answer all questions

① The value of Wronskian $W(x, y, z)$ is
 (a) $2x^2$ (b) $3x^2$ (c) $2x$ (d) None of these.

② The equation $\frac{dz}{dx} + z = \frac{2x}{x^2}$ is a linear differential equation
 (a) $z = ax + b$ (b) $z = 2ax + b$ (c) $z = a(x^2 + b)$
 (d) None of these.

③ The complete solution of $z = px + qy + \sqrt{p^2 + q^2}$ is
 (a) $z = ax + by + c$ (b) $z = ax + by + c$
 (c) $z = ax + by + z^2$ (d) None of these.

④ The solution of $x^2 + y^2 = z$ is
 (a) $f(x^2, y)$ (b) $f(x, y^2)$ (c) $f(x, y, z)$
 (d) None of these.

⑤ The solution of $\frac{dz}{dx} = z$ is
 (a) $z = f(x) + y f(y)$ (b) $z = f(x + y) f(y)$
 (c) $z = f(x) + y f(y) + y^2 f(y)$ (d)
 $z = f(x) + y f(y) + x^2 f(y)$

⑥ Solving $z = px$ is

(a) $z = \sqrt{x} + \frac{1}{y} - b$

(b) $z = \sqrt{x} + \frac{1}{y} + b$

(c) $z = \sqrt{x} + \frac{1}{y} - b$

(d) $z = \sqrt{x} + \frac{1}{y} + b$

⑦ The Bernoulli differential equation is transformed by substituting
 $u = z^{\alpha}$ into the equation $z = f(x) + y g(x)$

(a) $\frac{\partial^2 z}{\partial x^2} - z^2 \frac{\partial^2 z}{\partial y^2} = 0$

(b) $z^2 \frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial y^2} = 0$

(c) $z^2 \frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial y^2} = 0$

(d) None of these.

(8) One dimensional wave equation is

(a) $\frac{\partial^2 u}{\partial t^2} = \frac{1}{c^2} \frac{\partial^2 u}{\partial x^2}$ (b) $\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2}$

(c) $\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x}$ (d) None of these.

(9) P.D.E. of second order in canonical form

$Rx + Sy + Tz + f(x, y, z, h, k, l) = 0$ then

$S^2 - 4RST > 0$ represents

(a) hyperbola (b) parabola (c) ellipse

(d) circle.

(10) Using the method of separation of variable,
the solution of the equation $4 \frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 3u$

is $u = e^{-5y}$ when $\lambda = 0$ is

(a) $u = e^{-2x-5y}$ (b) $u = e^{2x-5y}$ (c) $u = e^{-2x+5y}$

(d) None of these.

Obj. - GEN

Answer all questions

① If an equation $M(x)y' + N(x)y = 0$ is not exact & let $F(x,y)$ be such that $F'(x,y) = M(x)y' + N(x)y = 0$ is exact then the function F is called

- (a) differentiable function (b) arbitrary function
(c) integrating factor (d) None of these

② If y_1, y_2 are two solutions of $\frac{dy}{dx} + P(x)y + Q(x)y^2 = 0$ then the general solution of this given eqn, y_1, y_2 are

- (a) directly dependent (b) linearly independent
(c) proportional (d) None of these

③ The value of function $w(x, y, z)$ is

- (a) $2x^2$ (b) $2x^3$ (c) $2x^4$ (d) $2x$

④ If $\phi(x, y) = z$ is a singular solution then $\phi(x, y)$ is a factor of

- (a) p-discriminant only (b) c-discriminant only
(c) Both p-discriminant & c-discriminant
(d) None of these

⑤ $\frac{dy}{dx} + \frac{y}{x} - 2y = 0$ has the solution

- (a) $y = C_1 e^{-2x} + C_2 e^x$ (b) $y = C_1 e^{-2x} + C_2 e^x$
(c) $y = C_1 e^{2x} + C_2 e^{-x}$ (d) None of these

⑥ The differential eqn $y'' + (y') + 9y = 50e^{2x}$

have particular integral

- (a) $\frac{2}{3}e^{2x}$ (b) $\frac{1}{3}e^{2x}$ (c) e^{2x} (d) None of these.

(1) The general solution of $y'' - 2y' + 2y = 0$ is

- (a) $(y - 2x + c_1) + (y - 2x + c_2) = 0$ (b) $(y + 2x + c_1) + (y + 2x + c_2) = 0$
- (c) $(y - 2x + c_1) + (y - 4x + c_2) = 0$ (d) None of these.

(2) The complementary function of $(D^2 - 4D)y = 0$ is

- (a) $y = C_1 e^{2x} + C_2 e^{-2x}$
- (b) $y = C_1 e^{2x} + C_2 e^{-2x} + C_3 \cos 2x + C_4 \sin 2x$
- (c) $y = (C_1 + C_2 x)e^{2x} + (C_3 + C_4 x)e^{-2x}$

(d) None of these

(3) The solution of F.D.E. $(y + z)dx + dy + dz = 0$ is

- (a) $y + z = C e^x$ (b) $y + z = e^x$
- (c) $y + z = C e^{-x}$ (d) None of these.

(4) The p-discriminant of the equation

$y = px + \frac{1}{p}$ is

- (a) $y^2 = 2$ (b) $y = 2$ (c) $y^2 = 4x$ (d) None of these.