	The Bodwad Sarvajanik Co-Op. Education Society Ltd., Bodwad **Arts, Commerce and Science College Bodwad** **Question Bank** **Class:-TYBSc** **Sem:-VI** **Subject: Ordinary and Partial Differential Equations** **Paper Name:- MTH 604**	
Sr. No.	**Questions**	**Ans**
1)	Partial difference equation by eliminating constants a and b from equation $z = ax + by + ab$ is …… a) $z = px + qy + pq$ b) $z = qx + py + pq$ c) $z = px - qy$ d) None of these	**A**
2)	Eliminating arbitrary function f from $z = x + y + f(xy)$ we get partial differential equation …… a) $px + qy = x + y$ b) $px - qy = x - y$ c) $px - qy = 0$ d) None of these	**B**
3)	Partial differential equation by eliminating constant a and b from equation $z = ax + by + a^2 + b^2$ is …… a) $z = px - qy - p^2 - q^2$ b) $z = px - qy$ c) $z = px + qy + p^2 + q^2$ d) None of these	**C**
4)	The general integral of $P_p + Q_q = R$ with usual notation is …… a) $f(u) = 0$ b) $f(v) = 0$ c) $f(u, v) = 0$ d) None of these	**C**
5)	Lagrange's auxiliary equation for $xp + yq = z$ is …… a) $\frac{dx}{y} = \frac{dy}{x}$ b) $\frac{dx}{x} = \frac{dy}{y} = \frac{dz}{z}$ c) $\frac{dx}{z} = \frac{dy}{x} = \frac{dz}{y}$ d) None of these	**B**

6)	Lagrange's auxiliary equation for $zp = -x$ is …… a) $\frac{dx}{z} = \frac{dy}{0} = \frac{dz}{-x}$ b) $\frac{dx}{0} = \frac{dy}{z} = \frac{dz}{-x}$ c) $\frac{dx}{-x} = \frac{dy}{0}$ d) None of these	**A**
7)	In $f(x, y, z, p, q) = 0$, $p =$ …… a) $\frac{\partial z}{\partial x}$ b) $\frac{\partial z}{\partial y}$ c) $\frac{\partial x}{\partial z}$ d) $\frac{\partial y}{\partial z}$	**A**
8)	Partial differential equation for $f(x, y, z, a, b) = 0$ is …… a) $f(x, y, z) = 0$ b) $f(x, y, z, p, q) = 0$ c) $f(u) = 0$ d) None of these	**B**
9)	From a partial differential equation for $z = ax - by$ by eliminating constants a and b is …… a) $z = px - qy$ b) $z = px + qy$ c) $z = px$ d) None of these	**A**
10)	With usual notation $f(x, y, z, p, q) = 0$, $q =$ …… a) $\frac{\partial z}{\partial y}$ b) $\frac{\partial z}{\partial x}$ c) $\frac{\partial x}{\partial z}$ d) $\frac{\partial y}{\partial z}$	**A**
11)	With usual notation, in linear partial differential equation $(y + xz)p - (x + yz)q = x^2 - y^2$ value of Q is …… a) $-x + yz$ b) $-(x + yz)$ c) y+xz d) $x^2 - y^2$	**B**

12)	In the given equation $z(xp - yq) = y^2 - x^2$ with usual notation, value of *R* is …… a) $y^2 - x^2$ b) $x^2 - y^2$ c) xz d) yz	**A**
13)	General integral of the given equation $\frac{dx}{z} = \frac{dy}{0} = \frac{dz}{-x}$ is …… a) $y = c_1, x^2 + z^2 = c_2$ b) $y = 0, x^2 + z^2 = c_1$ c) $y = 0, x^2 - z^2 = c_2$ d) None of these	**A**
14)	If the equation is of the form $\frac{d^n y}{dx^n} = f(x)$ then we multiply both sides by …… a) $\left(\frac{dy}{dx}\right)^2$ b) $3\frac{dy}{dx}$ c) $2\frac{dy}{dx}$ d) None of these	**D**
15)	With usual notation if $p_1 - p_0 = 0$ then the differential equation $p_0 \frac{dy}{dx} - p_1 y = 0$ is a) Exact b) Non-Exact c) Regular d) None of these	**A**
16)	Given equation $xy\frac{d^2y}{dx^2} + x\left(\frac{dy}{dx}\right) + y\frac{dy}{dx} = 0$ is a) Linear b) Non-linear c) Regular d) None of these	**B**
17)	If $y''' = xe^x$ then $y'' =$ …… a) $xe^x + c_1$ b) $e^x - c_1$ c) $xe^x - e^x + c_1$ d) None of these	**C**

18)	If $y'' = \frac{a}{x}$ then $y' =$ ..... a) $a \log x + c_1$ b) $\frac{a}{x} + c_1$ c) $\log x$ d) None of these	**A**
19)	If $y' = a \log x + c_1$ then y $=$ ..... a) $a \log x + c_1 x + c_2$ b) $ax(\log x - 1) + c_1 x + c_2$ c) 0 d) None of these	**B**
20)	If $y'' = \frac{a}{y^3}$ then $(y')^2 =$ ..... a) $\frac{-a}{y^2} + c_1$ b) $\frac{a}{y^2} + c_1$ c) $\frac{a}{y^4} + c_1$ d) None of these	**A**
21)	If $\frac{d^2y}{dx^2} = \frac{a}{y^3}$ then its integrating factor is a) $\frac{dy}{dx}$ b) $2\frac{dy}{dx}$ c) $3\frac{dy}{dx}$ d) $\left(\frac{dy}{dx}\right)^2$	**B**
22)	If $y''' = \log x$ then $y'' =$ ..... a) $x \log x - x + c_1$ b) $\log x + x + c_1$ c) $\log x$ d) None of these	**A**
23)	If $(x^2 - 2x)\frac{dy}{dx} + (3x^2 - 2)y = c_1$ then with usual notation $p_1 - p_0 =$ ..... a) 0 b) 1 c) Non-zero d) None of these	**A**

24)	First integral of $xy\frac{d^2y}{dx^2} + x\left(\frac{dy}{dx}\right)^2 + y\frac{dy}{dx} = 0$ is a) $xy\frac{dy}{dx} = c_1$ b) $y\frac{dy}{dx} = 0$ c) $x\frac{dy}{dx} = c_1$ d) None of these	**A**
25)	In $\cot x\frac{dy}{dx} + (\text{cosec}^2 x)y = c_1$ with usual notation $p_1 - p_0 =$ ……. a) 0 b) $2\,\text{cosec}^2 x$ c) $\text{cosec}^2 x$ d) None of these	**B**
26)	The exponential function e^x has the power series …… a) $1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \ldots\ldots$ b) $1 - x + \frac{x^2}{2!} + \frac{x^3}{3!} + \ldots\ldots$ c) $1 + x + x^2 + x^3 + \ldots\ldots$ d) $1 - x + x^2 - x^3 + \ldots\ldots$	**A**
27)	For the equation $x(x-1)y'' + (\sin x)y' + 2x(x-1)y = 0$, consider the following statements. $P \Rightarrow x = 0$ is regular singular point. $Q \Rightarrow x = 1$ is regular singular point. a) Both P and Q are true b) P is false but Q is true c) P is true but Q is false d) Both P and Q are false	**A**
28)	The power series solution of $y' - y = 0$ is …… a) $c_0\left(1 - x + \frac{x^2}{2!} + \frac{x^3}{3!} + \ldots\right)$ b) $c_0\left(1 + x + \frac{x^2}{2} + \frac{x^3}{3} + \ldots\right)$ c) $c_0\left(1 - x + \frac{x^2}{2} + \frac{x^3}{3} + \ldots\right)$ d) $c_0\left(1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \ldots\right)$	**D**

29)	The indicial equation for $x(1+x^2)y'' + (\cos x)y' + (1-3x+x^2)y = 0$ is …… a) $r^2 = 0$ b) $r^2 - r = 0$ c) $r^2 + r = 0$ d) $r^2 - 1 = 0$	**A**
30)	The indicial equation for $9x(1-x)y'' + 12y' + 4y = 0$ is …… a) $k(k-7) = 0$ b) $k(3k-5) = 0$ c) $k(k-5) = 0$ d) $k(3k-7) = 0$	**B**
31)	The indicial equation for $2x^2y'' + xy' - (x+1)y = 0$ is …… a) $k^2 - 1 = 0$ b) $k^2 + 1 = 0$ c) $(k-1)^2 = 0$ d) None of these	**A**
32)	Singular point are …… a) Regular b) Irregular c) Regular and irregular d) None of these	**C**
33)	For the equation $(x^2-1)y'' + xy' - y = 0$ which of the following statement is true? a) 0 and 1 both ordinary point b) 0 and 1 both regular singular point c) 0 is ordinary and 1 is regular singular point d) None of these	**C**
34)	The point $x = x_0$ is called ordinary point of equation $y'' + P(x)y' + Q(x)y = 0$ if …… a) $P(x)$ and $Q(x)$ are analytic at x_0 b) $P(x)$ and $Q(x)$ are not analytic at x_0 c) $P(x)$ is analytic but $Q(x)$ is not analytic at x_0 d) None of these	**A**

35)	A point $x = x_0$ is called regular singular point of equation $y'' + P(x)y' + Q(x)y = 0$ if …… a) Both $(x - x_0)P(x)$ and $(x - x_0)^2Q(x)$ are analytic b) Only $(x - x_0)^2Q(x)$ is analytic c) Only $(x - x_0)P(x)$ is analytic d) None of these	**A**
36)	In $xy''' + (x^2 + x + 3)y'' + (4x + 2)y' + 2y = 0,\ p_3 - p_2' + p_1'' - p_0''' =$ …… a) 0 b) 2 c) Non-zero d) 1	**A**
37)	If $(x^3 - 2y)y' + (3x^2 - 2)y = 0$ then its first integral is a) $(3x^2 - 2)y = c_1$ b) $(x^3 - 2y)y = c_1$ c) $y = c_1x$ d) None of these	**B**
38)	First integral of $\cos y \frac{d^2y}{dx^2} - \sin y \left(\frac{dy}{dx}\right)^2 = 1$ is a) $\cos y \frac{dy}{dx} = x + c_1$ b) $\sin y \frac{dy}{dx} = c_1$ c) $\cos y \frac{dy}{dx} = c_1$ d) None of these	**A**
39)	If $y = e^{ax}$ is a solution of $y'' + Py' + Qy = 0$ then a) $a^2 + Pa + Q = 0$ b) $P + Qx = 0$ c) $1 + P + Q = 0$ d) $1 - P + Q = 0$	**A**
40)	If $y = x$ is a solution of $y'' + Py' + Qy = 0$ a) $a^2 + Pa + Q = 0$ b) $P + Qx = 0$ c) $1 - P + Q = 0$ d) $1 + P + Q = 0$	**B**

41)	If $y = e^x$ is a solution of $y'' + Py' + Qy = 0$ then a) $1 + P + Q = 0$ b) $1 - P - Q = 0$ c) $P + Qx = 0$ d) $a^2 + Pa + Q = 0$	**A**
42)	If $m(m-1) + Pmx + Qx^2 = 0$ then $y =$ ..... is a solution of $y'' + Py' + Qy = 0$ a) x^{m-1} b) x^m c) e^{ax} d) None of these	**B**
43)	Order of $y'' + Py' + Qy = R$ with usual notation is ..... a) 1 b) Zero c) 2 d) None of these	**C**
44)	With usual notation, in a given equation $\sin^2 x \frac{d^2y}{dx^2} - 2y = 0$, value of $P =$ ..... a) 0 b) $-2\operatorname{cosec}^2 x$ c) $\sin^2 x$ d) None of these	**A**
45)	By using removal of first derivative, if $y = uV$ be complete solution of the given equation then V is given by usual notation a) $\frac{d^2V}{dx^2} - SV = I$ b) $\frac{d^2V}{dx^2} + IV = S$ c) $\frac{d^2V}{dx^2} - V = \frac{S}{I}$ d) None of these	**B**
46)	To solve $\frac{d^2y}{dx^2} - \cot x \frac{dy}{dx} - y \sin^2 x = \cos x$ by changing the independent variable with usual notation we choose $z =$ ..... a) $-\cos x$ b) $\cos x$ c) $\sin x$ d) $\tan x$	**A**

47)	To solve $y'' - \cot x y' - y \sin^2 x = \cos x - \cos^3 x$ by change of independent variable, with usual notation we use z such that $\left(\frac{dz}{dx}\right)^2 = \ldots\ldots$ a) $\sin^2 x$ b) $-\sin^2 x$ c) $-\cot x$ d) $\cot x$	**A**
48)	If $\frac{dy}{dx} + \left(\frac{4}{x}\right) y = 0$ then $y = \ldots\ldots$ a) $\frac{c_1}{x^4}$ b) $-\frac{c_1}{x^3}$ c) $\frac{c_1}{x^5}$ d) None of these	**A**
49)	By change of independent variable, with usual notation we remove …… derivative from $y'' + Py' + Qy = R$ a) Second b) First c) Third d) None of these	**B**
50)	To solve $y'' + \frac{2}{1+x^2} y' + \frac{4}{(1+x^2)^2} y = 0$ by change of independent variable, with usual notation we choose $z = \ldots\ldots$ a) $\tan^{-1}(x)$ b) $2\tan^{-1}(x)$ c) $\cot^{-1}(x)$ d) $\sin^{-1}(x)$	**B**