Q1. The integrating factor of the differential equation $(1-x^2)\frac{dy}{dx}+xy=ax, -1<x<1$, is: **1 Mark**

A $\frac{1}{x^2-1}$ **B** $\frac{1}{\sqrt{x^2-1}}$

C $\frac{1}{1-x^2}$ **D** $\frac{1}{\sqrt{1-x^2}}$

Q2. The sum of the order and the degree of the differential equation $\frac{d^2y}{dx^2}+\left(\frac{dy}{dx}\right)=\sin y$ is: **1 Mark**

A 5 **B** 2 **C** 3 **D** 4

Q3. The order of the differential equation of the family of circles touching x-axis at the origin is: **1 Mark**

A 1 **B** 2 **C** 3 **D** 4

Q4. If $y=\log_e\left(\frac{x^2}{e^2}\right)$, then $\frac{d^2y}{dx^2}$ is equal to: **1 Mark**

A $-\frac{1}{x}$ **B** $-\frac{1}{x^2}$

C $\frac{2}{x^2}$ **D** $-\frac{2}{x^2}$

Q5. The number of arbitrary constants in the particular solution of a differential equation of second order is (are): **1 Mark**

A 0 **B** 1 **C** 2 **D** 3

Q6. The general solution of the differential equation x dy - (1 + x^2) dx = dx is: **1 Mark**

A $y=2x+\frac{x^3}{3}+C$ **B** $y=2\log x+\frac{x^3}{3}+C$

C $y=\frac{x^2}{2}+C$ **D** $y=2\log x+\frac{x^2}{2}+C$

Q7. The integrating factor of the differential equation $(x+3y^2)\frac{dy}{dx}=y$ is: **1 Mark**

A y **B** $-y$ **C** $\frac{1}{y}$ **D** $-\frac{1}{y}$

Q8. **1 Mark**

The degree of the differential equation $x^2\frac{d^2y}{dx^2}=\left(x\frac{dy}{dx}-y\right)^3$ is

A 1 **B** 2 **C** 3 **D** 6

Q9. The degree and the order of the differential equation: **1 Mark**

$\frac{d^2y}{dx^2}=\sqrt{1}+\left(\frac{dy}{dx}\right)^3$ are:

A 2 and 3. **B** 3 and 2. **C** 2 and 2. **D** 3 and 3.

Q10. Choose the correct answer from the given four option. **1 Mark**

Solution of differential equation xdy - ydx = 0 represents:

A A rectangular hyperbola. **B** Parabola whose vertex is at origin.

C Straight line passing through origin. **D** A circle whose centre is at origin.

A circle whose centre is at origin.

Q11. What is the order of differential equation y'' + 5y' + 6 = 0? **1 Mark**

A 0 **B** 1 **C** 2 **D** 3

Q12. What is the degree of the differential equation: **1 Mark**

$y=x\frac{dy}{dx}+\left(\frac{dy}{dx}\right)^{-2}$?

A 1 **B** 3 **C** -2 **D** Degree does not exist.

Q13. Choose the correct answer from the given four option. **1 Mark**

The solution of the differential equation $\frac{dy}{dx}=\frac{1+y^2}{1+x^2}$ is:

A $y=\tan^{-1}x$ **B** $y-x=k(1+xy)$

C $x=\tan^{-1}y$ **D** $\tan(xy)=k$

Q14. The solution of the differention $\frac{dy}{dx}+1=e^{x+y}$ is: **1 Mark**

A $(x+y)e^{x+y}=0$ **B** $(x+C)e^{x+y}=0$

C $(x-C)e^{x+y}=1$ **D** $(x-C)e^{x+y}+1=0$

Q15. Find the degree of the differential equation: **1 Mark**

$\left(1+\frac{dx}{dy}\right)^3=\left(\frac{dy}{dx}\right)^2$

A 0 **B** 1 **C** 2 **D** 3

Q16. What are the order and degree, respectively, of the differential equation: **1 Mark**

$\left(\frac{d^3y}{dx^3}\right)^2=y^4+\left(\frac{dy}{dx}\right)^5$?

A 4, 5 **B** 2, 3 **C** 3, 2 **D** 5, 4

Q17. Consider the following statements in respect of the differential equation $\frac{d^2y}{dx^2}+\cos\left(\frac{dx}{dy}\right)=0$: **1 Mark**

1. The degree of the differential equation is not defined.
2. The order of the differential equation is 2.

Which of the above statements is/are correct ?

A 1 only **B** 2 only **C** Both 1 and 2 **D** not defined

Q18. The solution of $\frac{d^2y}{dx^2}=0$ represents: **1 Mark**

A a straight line **B** a circle **C** a parabola **D** a point

Q19. The Solution of $\cos(x+y)\,dy=dx$ is: **1 Mark**

A $y=\tan\left(\frac{x+y}{2}\right)+c$ **B** $y=\cos^{-1}\left(\frac{y}{x}\right)+c$

C $y=x\sec\left(\frac{y}{x}\right)+c$ **D** None of these

Q20. Choose the correct answer from the given four option. **1 Mark**

Integrating factor of the differential equation $(1-x^2)\frac{dy}{dx}-xy=1$is:

A $-x$ **B** $\frac{x}{1+x^2}$

C $\sqrt{1-x^2}$ **D** $\frac{1}{2}\log(1-x^2)$

Q21. Choose the correct answer from the given four options. **1 Mark**

The solution of the differential equation $\frac{dy}{dx}+\frac{2xy}{1+x^2}=\frac{1}{(1+x^2)^2}$ is:

A $y(1+x^2)=C+\tan^{-1}x$ **B** $\frac{y}{1+x^2}=C+\tan^{-1}x$

C $y\log(1+x^2)=C+\tan^{-1}x$ **D** $y(1+x^2)=C+\sin^{-1}x$

Q22. The differential equation of all parabolas whose axes are parallel to y-axis is: **1 Mark**

A $\frac{dy}{dx}=-\frac{c^2}{x^2}$ **B** $\frac{d^2x}{dy^2}=c$

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

Q23. The solution of the differential equation $xdy+ydy=x^2y\,dy-y^2x\,dx$, is: **1 Mark**

A $x^2-1=C(1+y^2)$ **B** $x^2+1=C(1+y^2)$ **C** $x^3-1=C(1+y^3)$ **D** $x^3+1=C(1-y^3)$

Q24. Solution of differential equation $x\,dy-yx=0$ represents: **1 Mark**

A rectangular hyperbola **B** straight line passing through origin

C parabola whose vertex is at origin **D** circle whose center is at origin

Q25. If $\frac{dy}{dx}=y\sin 2x, y(0)=1$ then solution is: **1 Mark**

A $y=e\sin^2x$ **B** $y=\sin^2x$

C $y=\cos^2x$ **D** $y=e\cos^2x$

Q26. **1 Mark**

The order of the differential equation $\left[1+\left(\frac{dy}{dx}\right)^5\right]^{\frac{2}{3}}=\frac{d^3y}{dx}$ is:

A 2 **B** 1 **C** 3 **D** $\frac{2}{3}$

Q27. The solution of the differential equation $\frac{dy}{dx}=\frac{x}{1+x^2}$ is: **1 Mark**

A $y=\frac{1}{2}\log|2+x^2|+c$ **B** $y=\frac{1}{2}\log(1+x)+c$

C $y=\log\left(\sqrt{1+x^2}\right)+c$ **D** None of these

Q28. The solution of the differential equation $\frac{dy}{dx}+\frac{2y}{x}=0$ with y(1) = 1 is given by.

A $y=\frac{1}{x^2}$ **B** $x=\frac{1}{y^2}$

C $x = \frac{1}{y}$ **D** $y = \frac{1}{x}$

Q29. Choose the correct answer from the given four option. **1 Mark**

Solution of $\frac{dy}{dx} - y = 1,\ y(0) = 1$is given by:

A $xy = -e^x$ **B** $xy = -e^{-x}$

C $xy = -1$ **D** $y = 2e^x - 1$

Q30. Solution of differential equation x.dy – y.dx = Q represents: **1 Mark**

A A rectangular hyperbola **B** Parabola whose vertex is at the origin

C Straight line passing through the origin **D** A circle whose centre is at the origin

Q31. Which of the following is a second-order differential equation? **1 Mark**

A $(y')^2 + x = y^2$ **B** $y'y'' + y = \sin x$

C $y''' + (y'')^2 + y = 0$ **D** $y' = y^2$

Q32. Choose the correct answer from the given four option. **1 Mark**

The degree of the differential equation $\left(\frac{d^2y}{dx^2}\right) + \left(\frac{dy}{dx}\right)^2 - \sin\left(\frac{dy}{dx}\right)$ is:

A 1 **B** 2 **C** 3 **D** Not defined

Q33. A homogeneous dofferential equation of the from $\frac{dx}{dy} = h(\frac{x}{y})$ can be solved by making the substitution: **1 Mark**

A y = vx **B** v = yx **C** x = vy **D** x = v

Q34. Which of the following differential equations has y = x as one of its particular solution? **1 Mark**

A $\frac{d^2y}{dx^2} - x^2\frac{dy}{dx} + xy = x$ **B** $\frac{d^2y}{dx^2} + x\frac{dy}{dx} + xy = x$

C $\frac{d^2y}{dx^2} - x^2\frac{dy}{dx} + xy = 0$ **D** $\frac{d^2y}{dx^2} + x\frac{dy}{dx} + xy = 0$

Q35. Choose the correct answer from the given four option. **1 Mark**

$\tan^{-1} + \tan^{-1} y = C$ is the general solution of the differential equation:

A $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$ **B** $\frac{dy}{dx} = \frac{1+x^2}{1+y^2}$

C $(1 + x^2)dy + (1 + y^2)dx = 0$ **D** $(1 + x^2)dx + (1 + y^2)dy = 0$

Q36. Choose the correct answer from the given four option. **1 Mark**

Which of the following is a second order differential equation?

A $(y')^2 + x = y^2$ **B** $y'y'' + y = \sin x$

C $y''' + (y'')^2 + y = 0$ **D** $y' = y^2$

Q37. Choose the correct answer from the given four options. **1 Mark**

The solution of $\frac{dy}{dx} + y = e^{-x}$, y(0) = 0 is:

A $y = e^{-x}(x - 1)$ **B** $y = xe^x$

C $y = xe^{-x} + 1$ **D** $y = xe^{-x}$

Q38. What is integrating factor of $\frac{dy}{dx} + y\sec x = \tan x$? **1 Mark**

A $\sec x + \tan x$ **B** $\log(\sec x + \tan x)$

C $e^{\sec x}$ **D** $\sec x$

Q39. Order of $\left(\frac{dy}{dx} + 3x\right)^{\frac{3}{2}} = x + \frac{3dy}{dx}$ is: **1 Mark**

A 3 **B** 2 **C** 1 **D** 4

Q40. Which of the following is a homogeneous differential equation? **1 Mark**

A (4x + 6y + 5) dy - (3y + 2x + 4) dx = 0 **B** (xy) dx - (x^3 + y^3) dy = 0

C (x^3 + 2y^2) dx + 2xy dy = 0 **D** y^2 dx + (x^2 - xy - y^2) dy = 0

Q41. Choose the correct answer from the given four option. **1 Mark**

The general solution of $e^x \cos y dx - e^x \sin y dy = 0$ is:

A $e^x \cos y = k$ **B** $e^x \sin y = k$

C $e^x = k \cos y$ **D** $e^x = k \sin y$

Q42. The solution of the differential equartion $y_1y_3 = y_2$ is: **1 Mark**

A $x = C_1e^{C_2y} + C_3$ **B** $y = C_1e^{C_2x} + C_3$

C $2x = C_1e^{C_2y} + C_3$ **D** None of these.

Q43. The order of the differential equartion $\sqrt{1 - x^4} + \sqrt{1 - y^4} = a(x^2 - y^2)$ is: **1 Mark**

A 1 **B** 2 **C** 3 **D** 4

Q44. The solution of the differention equation $(1+x^2)\frac{dy}{dx}+1+y^2=0$ is: **1 Mark**

A $\tan^{-1}x-\tan^{-1}y=\tan^{-1}C$ **B** $\tan^{-1}y-\tan^{-1}x=\tan^{-1}C$
C $\tan^{-1}y\pm\tan^{-1}x=\tan^{-1}C$ **D** $\tan^{-1}y+\tan^{-1}x=\tan^{-1}C$

Q45. The general solution of the differential equation $\frac{dy}{dx}=e^{x+y}$is **1 Mark**

A $e^x+e^{-y}=C$ **B** $e^x+e^y=C$
C $e^{-x}+e^y=C$ **D** $e^{-x}+e^{-y}=C$

Q46. $y=\sin$ kt satisfies the differential equation y''+9y = 0. Then k: **1 Mark**

A ±3 **B** 0 **C** ±2 **D** ±4

Q47. Which of the following differential equations has $y=c_1e^x+c_2e^{-x}$ as the general solution? **1 Mark**

A $\frac{d^2y}{dx^2}+y=0$ **B** $\frac{d^2y}{dx^2}-y=0$
C $\frac{d^2y}{dx^2}+1=0$ **D** $\frac{d^2y}{dx^2}-1=0$

Q48. The differential equation of all 'Simple Harmonic Motions' of given period $\frac{2\pi}{n}$ is: **1 Mark**

A $\frac{d^2x}{dt^2}+nx=0$ **B** $\frac{d^2x}{dt^2}+n^2x=0$
C $\frac{d^2x}{dt^2}-n^2x=0$ **D** $\frac{d^2x}{dt^2}+\frac{1}{n^2}=0$

Q49. The solution of the differential equation $(x^2+1)\frac{dy}{dx}+(y^2+1)=0$ is: **1 Mark**

A $y=2+x^2$ **B** $y=\frac{1+x}{1-x}$
C $y=x(x-1)$ **D** $y=\frac{1+y}{1-y}$

Q50. Choose the correct answer from the given four option. **1 Mark**

Integrating factor of the differential equation $\frac{dy}{dx}+y\tan x-\sec x=0$ is:

A $\cos x$ **B** $\sec x$
C $e^{\cos x}$ **D** $e^{\sec x}$

Q51. Order of $\left(\frac{dy}{dx}\right)^3+\left(\frac{dy}{dx}\right)^2+y^4=0$ is: **1 Mark**

A 4 **B** 3 **C** 1 **D** 2

Q52. What is the solution of the differential equation $\frac{dy}{dx}+\frac{y}{x}=0$? Where c is a constant. **1 Mark**

A xy = c **B** x = cy **C** y = cx **D** None of the above

Q53. The differential equation of all conics with centreat origin is of order: **1 Mark**

A 2 **B** 3 **C** 4 **D** 1

Q54. Choose the correct answer from the given four option. **1 Mark**

The order and degree of the differential equation $\frac{d^2y}{dx^2}+\left(\frac{dy}{dx}\right)^{\frac{1}{4}}+x^{\frac{1}{5}}$ respectively, are:

A 2 and 4 **B** 2 and 2 **C** 2 and 3 **D** 3 and 3

Q55. Integrating factor of the differential equation $\cos x\frac{dy}{dx}+y\sin x=1$ is: **1 Mark**

A $\cos x$ **B** $\tan x$ **C** $\sec x$ **D** $\sin x$

Q56. If P and q are the order and degree of the differention $y\frac{dy}{dx}+x^3\frac{d^2y}{dx^3}+xy=\cos x$ then: e. **1 Mark**

A $p<q$ **B** $p=q$
C $p>q$ **D** None of thes

Q57. The integrating factor of the differential equation$(1-y^2)\frac{dx}{dy}+yx=ay(-1<y<1)$ is: **1 Mark**

A $\frac{1}{y^2-1}$ **B** $\frac{1}{\sqrt{y^2+1}}$
C $\frac{1}{1-y^2}$ **D** $\frac{1}{\sqrt{1-y^3}}$

Q58. Integration factor of differential equation $\frac{dy}{dx}+py=Q$, where P and IQ are functions of x is: **1 Mark**

A $\int e^p dx$ **B** $e\int pdx$
C $e-\int pdx$ **D** None of these

Q59. The solution of the differential equation $\frac{dy}{dx}=\frac{ax+g}{by+f}$ represents a circle when

A $a=b$ **B** $a=-b$
C $a=-2b$ **D** $a=2b$

Q60. A homogeneous differential equation of the from $\frac{dx}{dy} = h\left(\frac{x}{y}\right)$ can be solved by making the substitution. **1 Mark**

A y = vx **B** v = yx **C** x = vy **D** x = v

Q61. The differention equation $\frac{dy}{dx} + Py = Qy^n, n > 2$ can be reduced to linear from by substituting: **1 Mark**

A $z = y^{n-1}$ **B** $z = y^n$

C $z = y^{n+1}$ **D** $z = y^{1-n}$

Q62. $x^{\frac{b-c}{bc}}\, x^{\frac{c-a}{ca}} x^{\frac{a-b}{ac}} =$ **1 Mark**

A a^{a+b+c} **B** x^{abc} **C** 1 **D** 0

Q63. The differential equation $\frac{d^2y}{dx^2} + \frac{dy}{dx} + y + x^2 = 0$ of the following type: **1 Mark**

A linear **B** homogeneous **C** order two **D** degree one

Q64. The general solution of the differntial equation $\frac{dy}{dx} + y\cot x = \text{coses}\, x$ is: **1 Mark**

A $x + y\sin x = C$ **B** $x + y\cos x = C$

C $y + x(\sin x + \cos x) = C$ **D** $y\sin x = x + C$

Q65. Consider a differential equation of order mm and degree nn. Which one of the following pairs is *not* feasible? **1 Mark**

A $(3, 2)$ **B** $(2, \frac{3}{2})$ **C** $(2, 4)$ **D** $(2, 2)$

Q66. Choose the correct answer from the given four options. **1 Mark**

The solution of the differential equation $\frac{dy}{dx} = e^{x-y} + x^2e^{-y}$ is:

A $y = e^{x-y} - x^2e^{-y} + c$ **B** $e^y - e^x = \frac{x^3}{3} + c$

C $e^x + e^y = \frac{x^3}{3} + c$ **D** $e^x - e^y = \frac{x^3}{3} + c$

Q67. Which of the following equation is a linear differential equation of order 3? **1 Mark**

[Note: The original question asks for linear equation, but it should be linear differential equation]:

A $\frac{d^3y}{dx^3} + \frac{d^2y\,dx}{dx^2dx} + y = x$ **B** $\frac{d^3y}{dx^3} + \frac{d^2y}{dx^2} + y^2 = x^2$

C $x\frac{d^3y}{dx^3} + \frac{d^2y}{dx^2} = e^x$ **D** $\frac{d^2y}{dx^2} + \frac{dy}{dx} = \log x$

Q68. The general solution of differention eqution $\frac{y\,dx - x\,dy}{y} = 0$ is: **1 Mark**

A xy = C **B** $x = Cy^2$ **C** y = Cx **D** $y = Cx^2$

Q69. Choose the correct answer from the given four option. **1 Mark**

$y = ae^{mx} + be^{-mx}$ satisfies which of the following differential equation?

A $\frac{dy}{dx} + my = 0$ **B** $\frac{dy}{dx} - my = 0$

C $\frac{d^2y}{dx^2} - m^2y = 0$ **D** $\frac{d^2y}{dx^2} + m^2y = 0$

Q70. The degree and the order of the differential equation **1 Mark**

$y = x\left(\frac{dy}{dx}\right)^2 + \left(\frac{dx}{dy}\right)^2$ are respectively:

A 1, 1 **B** 2, 1 **C** 4, 1 **D** 1, 4

Q71. The solution of the differential equation $\frac{dy}{dx} = \frac{y}{x} + \frac{\phi(\frac{y}{x})}{\phi'(\frac{y}{x})}$ is: **1 Mark**

A $\phi(\frac{y}{x}) = Kx$ **B** $x\phi(\frac{y}{x}) = K$

C $\phi(\frac{y}{x}) = Ky$ **D** $y\phi(\frac{y}{x}) = K$

Q72. The solution of $x^2 + y^2\frac{dy}{dx} = 4$ is: **1 Mark**

A $x^2 + y^2 = 12x + C$ **B** $x^2 + y^2 = 3x + C$ **C** $x^3 + y^3 = 3x + C$ **D** $x^3 + y^3 = 12x + C$

Q73. Choose the correct answer from the given four options. **1 Mark**

The curve for which the slope of the tangent at any point is equal to the ratio of the abcissa to the ordinate of the point is:

A An ellipse. **B** Parabola. **C** Circle. **D** Rectangular hyperbola.

Q74. Choose the correct answer from the given four option. **1 Mark**

The differential equation for $y = A\cos\alpha x + B\sin\alpha x$, where A and B are arbitrary constants is:

A $\frac{d^2y}{dx^2} - \alpha^2y = 0$ **B** $\frac{d^2y}{dx^2} + \alpha^2y = 0$

C $\frac{d^2y}{dx^2} + \alpha y = 0$ **D** $\frac{d^2y}{dx^2} - \alpha y = 0$

Q75. The number of arbitrary constants in the particular solution of a differential equation of third order is: **1 Mark**

A 3 **B** 2 **C** 1 **D** 0

Q76. Which of the following transformation reduce the differential quation into the form $\frac{du}{dx} + P(x)u = Q(x)$ into the from $\frac{dz}{dx} + \frac{z}{x}\log z = \frac{z}{x^2}(\log z)^2$ **1 Mark**

A $u = \log x$ **B** $u = e^z$
C $u = (\log z)^{-1}$ **D** $u = (\log z)^2$

Q77. The differential equation $x\frac{dy}{dx} - y = x^2$ has the general solution: **1 Mark**

A $y - x^3 = 2Cx$ **B** $2y - x^3 = Cx$ **C** $2y + x^2 = 2Cx$ **D** $y + x^2 = 2Cx$

Q78. The order and degree of the differential equation $\left(1 + 3\frac{dy}{dx}\right)^{\frac{2}{3}} = 4\frac{d^3y}{dx^3}$ are: **1 Mark**

A $1, \frac{2}{3}$ **B** $3, 1$ **C** $1, 2$ **D** $3, 3$

Q79. The solution of the differential equation $dy = (1 + y^2)\,dx$ is: **1 Mark**

A $y = \tan x + c$ **B** $y = \tan(x + c)$
C $\tan^{-1}(y + c) = x$ **D** $(\tan^{-1}(y + c) = 2x$

Q80. Choose the correct answer from the given four option. **1 Mark**
If $y = e^{-x}(A\cos x + B\sin x)$, then y is a solution of:

A $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} = 0$ **B** $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 2y = 0$
C $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + 2y = 0$ **D** $\frac{d^2y}{dx^2} + 2y = 0$

Q81. Find the order of differential equations: **1 Mark**
$2x^2\frac{d^2y}{dy^2} - 3\frac{dx}{dx} + y = 0$

A 2 **B** 1 **C** 0 **D** Undefined

Q82. Which of the following differentials equation has y = x as one of its particular solution? **1 Mark**

A $\frac{d^2y}{dx^2} - x^2\frac{dy}{dx} + xy = x$ **B** $\frac{d^2y}{dx^2} + x^2\frac{dy}{dx} + xy = x$
C $\frac{d^2y}{dx^2} - x^2\frac{dy}{dx} + xy = 0$ **D** $\frac{d^2y}{dx^2} + x^2\frac{dy}{dx} + xy = 0$

Q83. The Integrating Factor of the differential equation $x\frac{dy}{dx} - y = 2x^2$ is **1 Mark**

A e^{-x} **B** e^{-y}
C $\frac{1}{x}$ **D** x

Q84. The solution of differential equation $(e^y + 1)\cos dx + e^y \sin x dy = 0$ is:

A $e^y + 1\sin x = c$ **B** $e^y \sin = c$
C $(e^y + 1)\cos x = c$ **D** None of these

Q85. What is the order of the differential equation:
$\left(\frac{dy}{dx}\right)^2 + \frac{dy}{dx} - \sin^2 y = 0.$

A 1 **B** 2 **C** 3 **D** Undefined

Q86. The order and degree of the differential equation, **1 Mark**
$\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^{\frac{1}{4}} + x^{\frac{1}{5}} = 0$ respectively are:

A 2 and not defined **B** 2 and 2 **C** 2 and 3 **D** 3 and 3

Q87. The general solution of differention eqution of the $e^x\,dy + (ye^x + 2x)dx = 0$ is: **1 Mark**

A $xe^y + x^2 = C$ **B** $xe^y + y^2 = C$ **C** $ye^x + y^2 = C$ **D** $ye^y + x^2 = C$

Q88. The famliy of curve in which the sub tangent at any point of a curve is double is the abscissae, is: **1 Mark**

A $x = Cy^2$ **B** $y = Cx^2$ **C** $x^2 = Cy^2$ **D** $Y = Cx$

Q89. The solution of the differential equation $2x\frac{dy}{dx} - y = 3$ resresents: **1 Mark**

A Circles. **B** Straight lines. **C** Ellipses. **D** Parabolas.

Q90. Solution of the differential equation $\frac{dy}{dx} + \frac{y}{x} = \sin x$ is: **1 Mark**

A $x(y + \cos x) = \sin x + C$ **B** $x(y - \cos x) = \sin x + C$

C $x(y + \cos x) = \cos x + C$ **D** None of these.

Q91. The number of arbitrary constants in the particular solution of differential equation of fourth order is: **1 Mark**

A 3 **B** 2 **C** 1 **D** 0

Q92. If $(x+y)^2\frac{dy}{dx}=a^2, y=0$ when x = 0, then y = a if $\frac{x}{a}=$ **1 Mark**

A 1 **B** $\tan 1$ **C** $\tan 1+1$ **D** $\tan 1-1$

Q93. Which of the following differentials equation has $y=C_1e^x+C_2e^{-x}$ as the general solution? **1 Mark**

A $\frac{d^2y}{dx^2}+y=0$ **B** $\frac{d^2y}{dx^2}-y=0$

C $\frac{d^2y}{dx^2}+1=0$ **D** $\frac{d^2y}{dx^2}-1=0$

Q94. Choose the correct answer from the given four option. **1 Mark**

The differential equation $y\frac{dy}{dx}+x=C$ represents:

A Family of hype. **B** Family of parabolas. **C** Family of ellipses. **D** Family of circles.

Q95. Choose the correct answer from the given four options. **1 Mark**

The general solution of $\frac{dy}{dx}=2x\,e^{x^2-y}$ is:

A $e^{x^2-y}=C$ **B** $e^{-y}+e^{x^2}=C$

C $e^y=e^{x^2}+C$ **D** $e^{x^2+y}=C$

Q96. Choose the correct answer from the given four options. **1 Mark**

Which of the following is the general solution of $\frac{d^2y}{dx^2}-2\frac{dy}{dx}+y=0$?

A $y=(Ax+B)e^x$ **B** $y=(Ax+B)e^{-x}$

C $y=Axe^x+Be^x$ **D** $y=A\cos x+B\sin x$

Q97. The solution of the differential equation $\frac{dy}{dx}=1+x+y^2+xy^2, y=(0)$ is: **1 Mark**

A $y^2=\exp\left(x+\frac{x^2}{2}-1\right)$ **B** $y^2=1+C\exp\left(x+\frac{x^2}{2}\right)$

C $y=\tan(C+x+x^2)$ **D** $y=\tan\left(x+\frac{x^2}{2}\right)$

Q98. The integrating factor of the differential equation $(x\log x)\frac{dy}{dx}+y=2\log x$ is given by: **1 Mark**

A $\log(\log x)$ **B** e^x

C $\log x$ **D** x

Q99. The degree of differential equation $[1+(\frac{dy}{dx})^2]^{\frac{1}{2}}=\frac{d^2y}{dx^2}$ is: **1 Mark**

A 4 **B** $\frac{3}{2}$ **C** 2 **D** Not defined

Q100. Which of the following is the integrating factor of $(x\log x)\frac{dy}{dx}+y=2\log x$? **1 Mark**

A x **B** e^x **C** $\log x$ **D** $\log(\log x)$