LEVEL-III

1. The D.E whose solution is y= $ae^x+be^{3x}+ce^{5x}$

1) $y_3+9y_2-23y_1+15y=0$

2) $y_3+9y_2-23y_1-15y=0$

3) $y_3-9y_2+23y_1-15y=0$

4) $y_3-23y_2+9y_1-15y=0$

2. The D. E. whose solution is $y=A\cos 2x+B\sin 2x+c$

1) $y_3-4y_1+2y=0$ 2) $y_3+4y_1=0$

3) $y_3+4y_1+2=0$ 4) $y_3+y_2+2y=0$

3. The D.E whose solution is $y=(c_1x+c_2)e^{5x}$

1) $y_2+10y_1+24y=0$

2) $y_2-10y_1+25y=0$

3) $y_2-5y_1+25y=0$

4 $y_2-5y_1+10y=0$

4. D.E whose solution is $y=e^{3x}(c_1\cos x+c_2\sin x)$

1) $y_2-3y_1+5y=0$

2) $y_2-6y_1+10y=0$

3) $y_2+6y_1+10y=0$

4) $y_2-6y_1-10y=0$

5. The D.E. whose solution is $(x-a)^2+(y-b)^2=r^2$ where a, b are arbitrary constants .

1) $r^2y_2=1+y^2$ 2) $r^2{y^2}_2=1+{y_1}^2$

3) $r{y^2}_2=\left[1+{y_1}^2\right]^3$

4) $r^2{y^2}_2=\left[1+{y_1}^2\right]^3$

6. D. E whose solution is $(y-k)^2=4(x-h)$

1) $2y_2+{y_1}^3=0$ 2) $y^2+2{y_1}^3=0$

3) $y_2=y_1$ 4) $2y_2+3{y_1}^3=0$

7. The D.E of the family of circles which touch the y - axis at the origin.

1) $y_1=\dfrac{x^2-y^2}{xy}$ 2) $y_1=\dfrac{x^2-y^2}{2xy}$

3) $y_1=\dfrac{y^2-x^2}{2xy}$ 4) $y_1-(y^2-x^2)+xy=0$

8. The D.E of the family of all circles in the first quadrant touching the coordinate axes.

1) $\left[1+y_1^2\right]^3=a^2{y_2}^2$ 2) $[1+y_2]^3=a^2{y_1}^2$

3) $\left[1+{y_1}^2\right]^2=a^2{y_2}^3$ 4) $[1+y_1]^3=a^2{y_2}^2$

9. The D.E of the family of parabolas having their focus at the origin and axis along the x-axis is

1) $y_1[yy_1-2x]=y$ 2) $y_1(y_1)^2=2xy_1+y$

3) $y_1(y_1)^2+2xy_1=y$ 4) $yy_1+2x=y$

10. Equation of the curve whose gradient at any point (x,y) on it is $\dfrac{x-a}{y-b}$ and which passes through the origin is

1) $x^2-y^2=2(ax-by)$

2) $x^2+y^2=2(ax+by)$

3) $x^2-y^2=2(bx+ay)$

4) $x^2+y^2=2(ax-by)$

11. Equation of the curve passing through $(0,0)$ and satisfying the equation $\dfrac{dy}{dx}=(x-y)^2$

1) $e^{2x}(1-x+y)=1+x-y$

2) $e^{2x}(1+x-y)=1-x+y$

3) $e^{2x}(1-x+y)=-(1+x+y)$

4) $e^{2x}(1+x+y)=1-x+y$

12. The solution of $\frac{dy}{dx}=\sqrt{1+x+y+xy}$

1) $\sqrt{1+y}=\sqrt{1+x}+c$

2) $\frac{2}{3}\sqrt{1+y}=(1+x)^{\frac{1}{2}}+c$

3) $3\sqrt{1+y}=(1+x)^{\frac{3}{2}}+c$]

4) $\sqrt{1+x}.\sqrt{1+y}=c$

13. The solution of $\frac{dy}{dx}+\frac{x(1+y^3)}{y^2(1+x^2)}=0$

1) $(1-x^2)+(1+y^3)=c$

2) $(1+y^2)+(1+x^3)=c$

3) $(1+x^2)^3(1+y^3)^2=c$

4) $(1+x^2)+(1+y^3)=cxy^2$

14. The solution of $a[xdy+ydx]=xy\ dy$

1) $a\log(xy)=y+c$ 2) $x+c=a\log(xy)$

3) $xy=y+c$ 4) $x+y=xy+c$

15. The solution of $(x^2+y)dx+(x+y^2)dy=0$

1) $(2x+1)+(2y+1)=c$

2) $x^2+xy+y^2=c$ 3) $x^3+3xy+y^3=c$

4) $x^3+xy+y^3=c$

16. Solution of cosy dy + cosx siny dx =0 given that $y=\frac{\pi}{2}$ when $x=\frac{\pi}{2}$

1) $\log(|\cos y|)+\cos x=1$ 2) $\log|\sin y|+\sin x=1$

3) $\log(|\sec y|)+\sec x=1$ 4) $\log|\cos ec y|+\sin x=1$

17. Solution of $\frac{dy}{dx}-x\tan(y-x)=1$

1) $\tan(y-x)=c\,e^{\frac{x^2}{2}}$ 2) $\sin(y-x)e^{-\frac{x^2}{2}}+c$

3) $\sec 2(y-x)ce^{\frac{x^2}{2}}$ 4) $\cos(y-x)e^{\frac{x^2}{2}}=c$

18. Solution of $x+y=\cos^{-1}\left(\frac{dy}{dx}\right)$ is

1) $x+c=\tan\left(\frac{x+y}{2}\right)$ 2) $x+c=\sin\left(\frac{x+y}{2}\right)$

3) $x+c=\sec\left(\frac{x+y}{2}\right)$ 4) $x+c=\cos ec\left(\frac{x+y}{2}\right)$

19. The solution of $\frac{dy}{dx}=(4x+y+1)^2$

1) $4x+y+1=2\tan(2x+c)$

2) $4x+y+1=\tan(x+c)$

3) $4x+y+1=2\tan(x+c)$

4) $4x+y+1=\tan(3x+c)$

20. $y(x)=e^{-x^2}\int_0^x e^{t^2}dt\Rightarrow\frac{dy}{dx}+2xy=$

1) 0 2) 1 3) 2 4) -2

21. On putting y = vx the equation $x^2dy+y(x+y)dx=0$ transformed to

1) $xdv+(v^2+2v)dx=0$

2) $vdx+(2x+x^2)dv=0$

3) $v^2dx=(x+x^2)dv$

4) $vdv+(2x+x^2)dx=0$

22. Solution of $y^2dx=(xy-x^2)dy$ given that y = 1 when x = 1

1) $(1+\log y)x=y$

2) $\log y=xy+1$ 3) $1+\log y=x$

4) $\log(xy)=\frac{y}{x}+1$

23. The solution of $(x^3-3xy^2)dx=(y^3-3x^2y)dy$

1) $y^2-x^2=c(x^2+y^2)^2$

2) $y^3-x^3=c(x^2+y^2)$

3) $y^2+x^2=c(x^2-y^2)$

4) $y^3+x^3=c(x^2-y^2)$

24. The solution of $\frac{dy}{dx}=\frac{y^2}{xy-x^2}$

1) $y=ce^{xy}$ 2) $y=ce^{\frac{y}{x}}$

3) $\log y=xy+c$ 4) $\log x=xy+c$

25. The solution of $\left(x^3-2y^3\right)dx+3xy^2dy=0$

1) $x^3-y^3=cx^2$ 2) $x^3=y^3$

3) $x^3-y^3=cx$ 4) $x^3+y^3=cx^2$

26. The solution of $\frac{dy}{dx}=\frac{y}{x}+\tan\left(\frac{y}{x}\right)$

1) $\sin\left(\frac{y}{x}\right)=cx$ 2) $\sin\left(\frac{y}{x}\right)=cy$

3) $\cos\left(\frac{y}{x}\right)=cx$ 4) $\sec\left(\frac{y}{x}\right)=cx$

27. Solution of $\frac{dy}{dx}=\frac{x-y+2}{x+y-1}$

1) $x^2+y^2+xy-4y-2x=c$

2) $x^2-y^2-2xy+4x+2y=c$

3) $x^2-y^2+xy+2x-4y=c$

4) $x^2+y^2-xy+4x-2y=c$

28. The solution of $\left(2x+3y-5\right)dx+\left(3x-4y+1\right)dy=0$

1) $x^2+3xy-2y^2-5x+y=c$

2) $x^2+3xy-4y^2-5x-y=c$

3) $x^2+3y^2-2xy+5x+y=c$

4) $x^2-3y^2-2xy+5x+y=c$

29. The solution of $\frac{dy}{dx}=\frac{x-2y+3}{2x-y+5}$

1) $x^2-2xy+y^2+3x-5y=c$

2) $x^2-4xy+y^2+6x-10y=c$

3) $x^2-4xy-y^2-3x+5y=c$

4) $x^2-2xy+2y^2+6x-5y=c$

30. The solution of $\left(6x+7y-4\right)dx+\left(7x-4y+3\right)dy=0$

1) $3x^2+7xy-2y^2-4x+3y=c$

2) $6x^2-4y^2+7xy-4x+3y=c$

3) $3x^2+14xy-4y^2-4x+3y=c$

4) $6x^2+4x-4y^2+4x+3y=c$

31. Solution of $\frac{dy}{dx}=\frac{x-2y+3}{2x+y-5}$

1) $x^2-y^2-4xy+6x+10y=c$

2) $x^2+y^2+xy+x-3y=c$

3) $x^2-y^2+2xy-x+3y=c$

4) $x^2+y^2-xy+x-3y=c$

32. Solution of $\frac{dy}{dx}=-\frac{12x+5y-9}{5x+2y-4}$

1) $x^2+3y^2+5xy-9x-4y=c$

2) $6x^2+2y^2+5xy+9x-4y=c$

3) $6x^2+y^2+5xy-9x-4y=c$

4) $6x^2+5y^2+10xy+9x+4y=c$

33. The solution of $\frac{dy}{dx}+\frac{2x+3y+1}{3x+4y-1}=0$

1) $x^2+3xy+2y^2+x-y=c$

2) $\left(x+y\right)^2+2x-3y=c$

3) $x^2+xy+y^2+2x-3y=c$

4) $x^2+3xy-2y^2-x+y=c$

34. The solution $\frac{dy}{dx}+\frac{3x+2y-5}{2x+3y-5}=0$

1) $x^2+xy-y^2-4x+6y=0$

2) $3x^2+4xy-3y^2+10x+10y=c$

3) $\left(x+2y\right)^2+3x+3y=c$

4) $3x^2+4xy+3y^2-10x-10y=c$

35. The solution of $\frac{dy}{dx}=\frac{y+\sqrt{x^2+y^2}}{x}$

1) $y+\sqrt{x^2+y^2}=cx^2$

2) $x+\sqrt{x^2+y^2}=cy^2$

3) $y+\sqrt{x^2+y^2}=cx$

4) $x+\sqrt{x^2+y^2}=cy$

36. Solution of $x\frac{dy}{dx}=x+y$ is

1) $y=\log|x|+c$ 2) $\log y=x+c$

3) $y=x(\log|x|+c)$

4) $y-x=\log x+c$

37. The solution of $\frac{dy}{dx}=\frac{x+y+1}{x+1}$

1) $\frac{y}{x+1}=\log(x+1)+c$

2) $y(1+x)=\log(x+1)+c$

3) $y(1+x)=(x+1)^2+c$

4) $y(1+x)=2(x+1)+c$

38. The solution of $\left[x+y\sin\left(\frac{y}{x}\right)\right]dx=x\sin\left(\frac{y}{x}\right)dy$

1) $\cos\left(\frac{y}{x}\right)+\log|x|=c$

2) $\sin\left(\frac{y}{x}\right)+\frac{1}{x}=c$

3) $x\cos\left(\frac{y}{x}\right)+\log|x|=c$

4) $x\sin\left(\frac{y}{x}\right)+\log|x|=c$

39. I.F of $1+(x\tan y-\sec y)\frac{dy}{dx}=0$

1) tany 2) secy 3) tanx 4) secx

40. The D.E. whose solution is $y=(a+bx)e^{kx}$ where a and b are arbitrary constants.

1) $y_2-2ky_1+k^2y=0$

2) $y_2+2ky_1+k^2y=0$

3) $y_2-2ky_1-k^2y=0$

4) $y_2+2ky_1-k^2y=0$

41. The D.E whose solution is $y=e^x(c_1\cos x+c_2\sin x)$

1) $y_2+2y_1=2y$ 2) $y_2+y_1+y=0$

3) $y_2-7y_1+2y=0$

4) $y_2-2y_1+2y=0$

42. D.E whose solution is $y=e^x(c_1\cos 2x+c_2\sin 2x)$

1) $y_2-2y_1+5y=0$ 2) $y_2-6y_1+4y=0$

3) $y_2-5y_1+2y=0$ 4) $y_2-y_1+4y=0$

43. D.E whose solution is $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

1) $xyy_2+xy_1^2=yy_1$ 2) $xyy_2+y_1=y$

3) $x^2y_2+xy_1=y$ 4) $x^2y_2+2xy_1=y_1^2$

44. The D.E whose solution is $\sqrt{1-x^2}+\sqrt{1-y^2}=m(x-y)$

1) $y_1=\sqrt{\frac{1-x^2}{1-y^2}}$

2) $\left(\sqrt{1-x^2}\right)\left(\sqrt{1-y^2}\right)=y_1$

3)) $y_1=\sqrt{\frac{1-y^2}{1-x^2}}$

4) $\sqrt{1-x^2}+\sqrt{1-y^2}=y_1$

45. The D. E of the family of circles passing through the origin and having their centres on the x - axis is

1) $y_1=\frac{y^2-x^2}{2xy}$ 2) $y_1=\frac{x^2+y^2}{xy}$

3) $y_1=\frac{x^2-y^2}{xy}$ 4) $y_1-(y^2-x^2)+xy=0$

46. D.E of the family of circles of fixed radius and having their centres on y- axis.

1) $y_1^2 = \frac{x^2}{r^2 - x^2}$ 2) $y_1^2 = \frac{r^2 - y^2}{y^2}$

3) $y_1^2 = r^2\left(r^2 - x^2\right)$ 4) $y_1^2 = r^2\left(x^2 - y^2\right)$

47. The D. E of the family of parabolas of which has a latus rectum and whose axes are parallel to x - axis

1) $y_1^3 + 2ay_2 = 0$ 2) $y_1^3 + ay_2 = 0$

3) $y_1^3 + 4ay_2 = 0$ 4) $y_1^3 + 3ay_2 = 0$

48. The D. E of allparabolas whose vertex is $(0,0)$ and axis is y - axis

1) $xy_1 = 2y$ 2) $2xy_1 = y$

3) $yy_1 = 2x$ 4) $y_2 + y = 2x$

49. The D.E of the family of ellipse with centre at the origin and having co -ordinate axes as axes is

1) $x\left[yy_2 + y_1^{\,2}\right] = yy_1$

2) $x^2 y_2 + y_1^{\,2} = y$ 3) $xyy_2 + y_1^{\,2} = y$

4) $xyy_2 + y_1^{\,2} + y = 0$

50. The D.E of the family of rectangular hyperbolas which have the co- cordinate axes as asymptotes

1) $xy_1 + y = 0$ 2) $xy_2 + y_1 = 0$

3) $xy_2 = y$ 4) $xy_2 + y = 0$

51. Equation of the curve whose sub tangent is constant is

1) $y^2 = ce^{\frac{x^2}{k}}$ 2) $y = cx^2$

3) $y = ce^{\frac{x}{k}}$ 4) $y = ce^{x^2}$

52. Equation of the curve whose sub normal is constant

1) $y^2 = 2kx + c$ 2) $y^2 = 2kx^2 + c$

3) $y^2 - x^2 = 2kx + c$ 4) $x^2 = 2ky + c$

53. Equation of the curve whose polar sub tangent $r^2 \frac{d\theta}{dr}$ is constant

1) $r(\theta + c) + k = 0$ 2) $r^2(\theta + c) = 2k$

3) $r(\theta - c) = k^2$ 4) $r\theta = c$

54. Equation of the curve which passes through the point $(1,1)$ and whose D.E is $(y - yx)dx + (x + xy)dy = 0$

1) $xy = e^{x-y}$ 2) $\frac{x}{y} = e^{x+y}$

3) $xy = e^{x/y}$ 4) $\frac{x}{y} = e^{x/y}$

55. Find the equation of the curve whose D.E is $\left(1 + y^2\right)dx = xydy$ and passing through $(1,0)$ is

1) $x^2 - y^2 = 1$ 2) $4x^2 - y^2 = 4$

3) $x^2 + y^2 = 1$ 4) $4x^2 + y^2 = 4$

56. Solution of $\sqrt{1 + x^2 + y^2 + x^2y^2} + xy\frac{dy}{dx} = 0$

1) $\log\left(\frac{x}{1 + \sqrt{1 + x^2}}\right) + \sqrt{1 + x^2} + \sqrt{1 + y^2} = c$

2) $\log\left(\frac{x}{\sqrt{1 + x^2}}\right) + \sqrt{1 - x^2} + \sqrt{1 + y^2} = c$

3) $\log\left(\frac{x}{\sqrt{1 + x^2}}\right) = c$

4) $\log = \left(\sqrt{1 + x^2} - \sqrt{1 + y^2}\right) + \log\left(\frac{x}{\sqrt{1 + x^2}}\right) = c$

57. The solution of x dy +ydx = $\sqrt{1 - x^2y^2}\,dx$

1) $\sin^{-1}(xy) = c - x$ 2) $xy = \sin(x + c)$

3) $\log\left(1 - x^2y^2\right) = x + c$

4) $y = x\sin x + c$

58. Solution of $\frac{dy}{dx} + \frac{y^2 + y + 1}{x^2 + x + 1} = 0$

1) $\tan^{-1}\left(\frac{2x + 1}{\sqrt{3}}\right) + \tan^{-1}\left(\frac{2y + 1}{\sqrt{3}}\right) = c$

2) $\sin^{-1}\left(\frac{2x + 1}{\sqrt{3}}\right) + \sin^{-1}\left(\frac{2y + 1}{\sqrt{3}}\right) = c$

3) $\sinh^{-1}\left(\frac{2x + 1}{\sqrt{3}}\right) + \sinh^{-1}\left(\frac{2y + 1}{\sqrt{3}}\right) = c$

4) $\sin^{-1}\left(\frac{2x + 1}{\sqrt{3}}\right) = c$

59. The solution of $\left(1-x^2\right)\frac{dy}{dx}+xy=xy^2$

1) $y\left(c+\sqrt{1-x^2}\right)=1-x^2$

2) $y\left(c-\sqrt{1-x^2}\right)=1-x^2$

3) $y\left(c+\sqrt{1-x^2}\right)=\sqrt{1-x^2}$

4) $y\left(c-\sqrt{1-x^2}\right)=\sqrt{1-x^2}$

60. The solution of $y\,dx-xdy=xy\ dx$

1) $y=cx^2$ 2) $y=cx^3$

3) $x=cy\,e^x$ 4) $y=cx\,e^x$

61. The solution of x dy - y dx = xy^2dx

1) $yx^2+2x=2cy$ 2) $x^2y+2y=2cx$

3) $xy+x=cy$ 4) $x^2y+2y=cx^3$

62. The solution of y dx - x dy + log x dx = 0

1) $(x+1)+\log x=cy$

2) $y+1+\log x=cx$

3) $\frac{(y+1)^2}{2}+\log x=cy$

4) $(y+1)^2=\log cx$

63. Solution of $\frac{dy}{dx}=\frac{x(2\log x+1)}{\sin y+y\cos y}$

1) $x\sin x=y^2\log y+c$

2) $y\sin y=x^2\log x+c$

3) $y\cos y=x\log x+c$

4) $y\sin y=2x\log x+c$

64. The solution of $e^x\sqrt{1-y^2}\,dx+\frac{y}{x}dy=0$

1) $(x-1)^2e^x=\left(1-y^2\right)+c$

2) $(x+1)e^x=\sqrt{1-y^2}+c$

3) $x.e^x=\sqrt{1-y^2}+c$

4) $(x-1)e^x=\sqrt{1-y^2}+c$

65. The solution of $y^2\cos\sqrt{x}dx-2\sqrt{x}e^{1/y}dy=0$

1) $e^{1/y}-\cos\sqrt{y}=c$ 2) $e^{1/y}+\sin\sqrt{x}=c$

3) $e^{-\frac{1}{y}}-\sin\sqrt{x}=c$ 4) $e^{-\frac{1}{y}}-\cos\sqrt{x}=c$

66. Solution of $y-x\frac{dy}{dx}=5\left(y^2+\frac{dy}{dx}\right)$

1) $(5+x)(1-5y)=cy$

2) $\frac{5+x}{1-5y}=cy$

3) $(5-x)(1+5y)=cy$

4) $(5+x)(5-x)=c$

68. Solution of $y-x\frac{dy}{dx}=3\left[1-x^2\frac{dy}{dx}\right]$

1) $(y+3)(1+3x)=cx$

2) $(y-3)(1-3x)=cx$

3) $(y-3)(1+3x)=cx$

4) $(y+3)(1-3x)=cx$

69. Solution of $x\,e^{x^2+y}.dx=y.dy$

1) $x.e^{x^2}+2y.e^y=c$

2) $e^{x^2}+2(y+1)e^{-y}=c$

3) $x.e^{x^2}+y=2y+c$

4) $x.e^{x^2}y=c$

70. The solution of $\frac{dy}{dx}=xy+x+y+1$

1) $y=\frac{x^2}{2}+xc$ 2) $x=\frac{y^2}{2}+y+c$

3) $y+1=c.e\left(\frac{x^2+2x}{2}\right)$

4) $y+1=x(x+1)$

71. Solution of $\frac{dy}{dx}=4+4x-3y-3xy$

1) $2\log(4-3y)+3x^2+6x=c$

2) $\log(3-4y)+3y^2+6y=c$

3) $(4-3y)(1+x)=c$

4) $\log(4-3y)+x^2+3x=c$

72. The solution of $\frac{dy}{dx}=xy+2x-3y-6$

1) $(y+2)^2=c.e^{(x-3)^2}$

2) $\log(y+2)=x^2-3x+c$

3) $y+2=2(x-3)+c$

4) $(y+2)(x-3)=c$

73. The solution of cos x cos y dx + sin x sin y dy = 0

1) $\cos x=c\sin y$ 2) $\sin x=c\cos y$

3) $\sec x-\sec y=c$ 4) $\tan x=c$

74. The solution of $Sin^{-1}y dx+\frac{x}{\sqrt{1-y^2}}dy=0$ is

1) $y\sin^{-1}x=c$ 2) $y=c\sin^{-1}x$

3) $y=\sin\left(\frac{c}{x}\right)$ 4) $x=c\sin y$

75. The solution of

$(1+\sin^2 x)dy+\cos x(1+y^2)dx=0$ given that

$y=2$ when, $x=\frac{\pi}{2}$

1) $y=\frac{\sin x+3}{3\sin x-1}$ 2) $y=\frac{3(\sin x-1)}{\sin x+3}$

3) $y=\frac{3\sin x+1}{\sin x-3}$ 4) $y=\frac{\sin x+3}{\sin x+1}$

76. Solution of $\sin^{-1}\left[\frac{dy}{dx}\right]=x+y$

1) $1+\tan\left(\frac{x+y}{2}\right)=-\frac{2}{x+c}$

2) $1+\cos\left(\frac{x+y}{2}\right)=-\frac{2}{x+c}$

3) $1+\sec\left(\frac{x+y}{2}\right)=-\frac{2}{x+c}$

4) $1+\cos\left(\frac{x+y}{2}\right)=\frac{2}{x+c}$

77. Solution of $(x-y)^2\frac{dy}{dx}=a^2$

1) $2y=c+a\log\left(\frac{x-y-a}{x-y+a}\right)$

2) $y=c+a\log\left(\frac{x-y+a}{x-y-a}\right)$

3) $2y=c-a\log\left(\frac{x-y}{x+y}\right)$

4) $2y^2=c+\log\left(\frac{x-y+a}{x-y-a}\right)$

78. Solution of $\left(\frac{x+y-a}{x+y-b}\right)\left(\frac{dy}{dx}\right)=\left(\frac{x+y+a}{x+y+b}\right)$

1) $\log\left[(x+y)^2-ab\right]=\frac{2}{b-a}[x-y]+k$

2) $\log\left[(x+y)^2+ab\right]=\frac{1}{b-a}[x+y]+k$

3) $\left(\frac{b-a}{2}\right)\left[\log\left((x+y)^2-ab\right)\right]=x+c$

4) $2\log(x+y)=\frac{x+y}{b-a}+k$

79. Solution of $\frac{dy}{dx}=\frac{x+y+7}{2x+2y+3}$

1) $6(x+y)+11\ \log(3x+3y+10)=9x+c$

2) $6(x+y)-11\ \log(3x+3y+10)=9x+c$

3) $6(x+y)-11\ \log(x+y+3)=3x+c$

4) $6(x+y)-11\ \log(x+y+3)=x+c$

80. Solution of $\frac{dy}{dx}=\frac{x+y-1}{x+y+1}$ is

1) $x+y=2x-y+c$ 2) $x+y=ce^{x-y}$

3) $\frac{x+y}{x-y}=c$ 4) $x^2-y^2=c$

81. The solution of $x^2\frac{dy}{dx}=x^2+xy+y^2$

1) $Tan^{-1}\left(\frac{y}{x}\right)=\log x+c$

2) $\log x+Tan^{-1}\frac{y}{x}=c$

3) $Tan^{-1}\left(\frac{x}{y}\right)=\log x+c$

4) $\log x+Tan^{-1}\left(\frac{x}{y}\right)=c$

82. I.F of $\frac{dy}{dx}+x\sin 2y=x^3\cos^2 y$

1) tany 2) $e^{\tan y}$

3) $e^{\sin y}$ 4) e^{x^2}

83. The differential equation of all non- vertical lines in a plane is

1) $\frac{d^2y}{dx^2}=0$ 2) $\frac{d^2x}{dy^2}=0$

3) $\frac{dy}{dx}=0$ 4) $\frac{dx}{dy}=0$

84. The differential equation of all non- horizontal lines in a plane is

1) $\frac{d^2y}{dx^2}=0$ 2) $\frac{d^2x}{dy^2}=0$

3) $\frac{dy}{dx}=0$ 4) $\frac{dx}{dy}=0$

85. The differential equation of all "simple Harmonic motins" of given period $\frac{2\pi}{n}$ is

1) $\frac{d^2x}{dt^2}+nx=0$ 2) $\frac{d^2x}{dt^2}+n^2x=0$

3) $\frac{d^2x}{dt^2}-n^2x=0$ 4) $\frac{d^2x}{dt^2}-\frac{1}{n^2}x=0$

86. The differential equation of family of curves whose tangent form an angle of $\pi/4$ with the hyperbola $xy=c^2$ is

1) $\frac{dy}{dx}=\frac{x^2+c^2}{x^2-c^2}$ 2) $\frac{dy}{dx}=\frac{x^2-c^2}{x^2+c^2}$

3) $\frac{dy}{dx}=\frac{-c^2}{x^2}$ 4) $\frac{dy}{dx}=\frac{c^2}{x^2}$

87. The differential equation of all parabolas whose axes are parallel to y - axis is

1) $\frac{d^3y}{dx^3}=0$ 2) $\frac{d^2x}{dy^2}=0$

3) $\frac{d^3y}{dx^3}+\frac{d^2y}{dx^2}=0$ 4) $\frac{d^2y}{dx^2}+2\frac{dy}{dx}=0$

88. The differential equation of all parabolas having their axis of symmetry with the axis of x is

1) $y\frac{d^2y}{dx^2}+\left(\frac{dy}{dx}\right)^2=0$ 2) $y\frac{d^2x}{dx^2}+\left(\frac{dy}{dx}\right)^2=0$

3) $y\frac{d^2y}{dx^2}+\left(\frac{dy}{dx}\right)=0$ 4) $y\frac{d^2y}{dx^2}-\left(\frac{dy}{dx}\right)=0$

89. The differential equation of the family of circle s with fixed radius r and with center on y - axis is

1) $y^2\left(1+y_1^2\right)=r^2y_1^2$

2) $y^2=r^2y_1+y_1^2$ 3) $x^2\left(1+y_1^2\right)=r^2y_1^2$

4) $x^2=r^2y_1+y_1^2$

90. The first order differential equation of the family of circles with fixed radius r and with centre on x - axis is

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

3) $\left(\frac{dy}{dx}\right)^2+y^2=r^2$ 4) $y^2-\left(\frac{dy}{dx}\right)^2=r^2$

91. The solution of $\frac{dy}{dx}=\frac{ax+h}{by+k}$ represents a parabola when

1) $a=0,b=0$ 2) $a=1,b=2$

3) $a=0,b\neq 0$ 4) $a=2,b=1$

92. The differential equation $y\frac{dy}{dx}+x=a$ repreents.

1) a set of circles whose centres are on the x- axis
2) a set of circles whose centres are on the y - axis
3) a set of parabolas
4) ellipses.

93. The differential equation of all circles passing through the origin and with centres on x- axis is

1) $x^2-y^2+2xy\frac{dy}{dx}=0$

2) $x^2+y^2-2xy\frac{dy}{dx}=0$

3) $x^2-y^2-2xy\frac{dy}{dx}=0$

4) $x^2+y^2+2xy\frac{dy}{dx}=0$

94. General solution of $\frac{dy}{dx}=\frac{1}{\log_x e}$ *is* $y=$

1) $\frac{1}{x}+c$ 2) $\frac{x^2}{2}+c$

3) $x\log_e x-x+c$ 4) $\frac{x}{2}+c$

95. The solution of

$\frac{dy}{dx}+ay=e^{mx}$ $is\ (where\ a+m=0)$

1) $e^{ax}y=x+c$ 2) $e^{ax}y=y+c$

3) $e^{ay}x=y+c$ 4) $e^{ay}y=x+c$

96. The differential equation of all straight lines in a plane passing through $(0,1)$ is

1) $y-1=mx$ 2) $y=m(x-1)$

2) $y=xy_1$ 4) $y=xy_1+1$

97. The curve for which the normal at any point (x,y) and the line joining origin to that point form an isosceles triangle with x axis as base is

1) an ellipse

2) a rectangular hyperbola

3) a circle 4) parabola

98. The differential equation of the family of curves

$\frac{x^2}{a^2}+\frac{y^2}{a^2+\lambda^2}=1$ is (λ is orbitary constant)

1) $(x^2-a^2)y_1=xy$

2) $(x^2-a^2)y_2-xy=0$

3) $x^2y_2-a^2y=0$

4) $(x^2-a^2)y_1+xy=0$

99. The D.E of simple hormonic motion given by

$x=A\cos(nt+\alpha)is$

1) $\frac{d^2x}{dt^2}+nx=0$ 2) $\frac{d^2x}{dt^2}+n^2x=0$

3) $\frac{d^2x}{dt^2}-n^2x=0$ 4) $\frac{d^2x}{dt^2}+\frac{1}{n^2}x=0$

100. The family of curves represented by

$\frac{dy}{dx}=\frac{x^2+x+1}{y^2+y+1}$ and the family represented by

$\frac{dy}{dx}+\frac{y^2+y+1}{x^2+x+1}=0$

1) touch each other

2) orthogonal ot each other

3) identical

4) intersect at an angle of $\frac{\pi}{4}$

101. The solution of the D. E

$yy_1=x\left[\frac{y^2}{x^2}+\frac{f(y^2/x^2)}{f^1(y^2/x^2)}\right]$ os

1) $f\left(\frac{y^2}{x^2}\right)=cx^2$ 2) $x^2f\left(\frac{y^2}{x^2}\right)=c^2y^2$

3) $x^2f(y^2/x^2)=c$ 4) $f\left(\frac{y^2}{x^2}\right)=cy/x$

102. The solution of the D. E $\frac{dy}{dx}=\frac{y.f^1(x)-y^2}{f(x)}$

equal to

1) $xy=f(x)+c$ 2) $xy=f(x)+cx$

3) $y(x+c)=f(x)$

4) $y=f(x)+x+c$

103. If $y+x\frac{dy}{dx}=x\frac{\phi(xy)}{\phi^1(xy)}$ then $\phi(xy)$ is equal to

1) $ke^{x^2/2}$ 2) $ke^{y^2/2}$ 3) $ke^{xy/2}$ 4) ke^{xy}

104. The function $f(\theta)=\frac{d}{d\theta}\int_0^\theta\frac{dx}{1-\cos\theta\cos x}$ satisfies the differential equation .

1) $\frac{df}{d\theta}+2f(\theta)\cot\theta=0$

2) $\frac{df}{d\theta}-2f(\theta)\cot\theta=0$

3) $\frac{df}{d\theta}+2f(\theta)=0$ 4) $\frac{df}{d\theta}-2f(\theta)=0$

105. The curve in which the slope of tangent at any point equal to the ratio of the obscissa to the oridinate of the point is

1) an ellipse 2) a parabola

3) a rectangular hyberbola

4) a circle .

KEY

1. 3	2. 2	3. 2	4. 2	5. 4
6. 1	7. 3	8. 1	9. 3	10.1
11. 1	12. 3	13 .3	14. 1	15. 3
16. 2	17. 2	18. 1	19. 1	20. 2
21. 1	22. 1	23. 1	24. 2	25. 4
26. 1	27. 2	28. 1	29. 2	30. 1
31. 1	32. 3	33. 1	34. 4	35. 1
36. 3	37. 1	38. 1	39. 2	40. 1
41. 4	42. 1	43. 1	44. 3	45. 1
46. 1	47. 1	48. 1	49. 1	50. 1
51. 3	52. 1	53. 1	54. 1	55. 1
56. 1	57. 2	58. 1	59. 3	60. 3
61. 1	62. 2	63. 2	64. 4	65. 2
66. 1	67. 2	68. 3	69. 2	70. 3
71. 1	72. 1	73. 2	74. 3	75. 1
76. 1	77.1	78. 1	79. 2	80. 2
81. 1	82. 4	83. 1	84. 2	85. 2
86. 2	87. 1	88. 1	89. 3	90. 1
91. 3	92. 1	93. 1	94. 3	95. 1
96. 4	97. 2	98. 4	99. 2	100. 2
101. 1	102. 3	103. 1	104. 1	105. 3

HINTS

1. D.E of $y = Ae^{\alpha x} + Be^{\beta x} + Ce^{\gamma x}$ is

$y_3 - (\alpha+\beta+\gamma) y_2 + (\alpha\beta + \beta\gamma + \gamma\alpha) y_1 -$

$(\alpha\beta\gamma) y = 0$

35. Verify option by ordinary differentiation.

38. Put y = vx

42. The D.E. of

$y = e^{\alpha x}[A\cos\beta x + B\sin\beta x] is$

$y_2 - 2\alpha y_1 + (\alpha^2 + \beta^2) y = 0$

57. $\int \frac{xdy + ydx}{\sqrt{1-(xy)^2}} = \int dx \Rightarrow Sin^{-1}(xy) = x + c$

62. divide with x^2 and use formula

$d\left(\frac{y}{x}\right) = \frac{xdy - ydx}{x^2}$

65. $\int \frac{Cos\sqrt{x}}{2\sqrt{x}} dx = \int \frac{e^{1/y}}{y^2} dy \Rightarrow Sin\sqrt{x} = -e^{1/y} + c$

67. $\int \frac{dy}{5-y} = \int \frac{x}{1-x^2} dx$

76. Put x + y = z and consider $Tan\left(\frac{z}{2}\right) = t$

77. Put x - y = z

78 . Put x + y = z

83. $y = mx + c \therefore \frac{d^2y}{dx^2} = 0$

84. $x = my + c \therefore \frac{d^2x}{dy^2} = 0$

85. Let x =cos (nt) or sin (nt) $\therefore \frac{d^2x}{dt^2} = -n^2 x$

86. $m = \frac{dy}{dx}$ slope of tangent of hyperbola =

$-\frac{c^2}{x^2}, \frac{m + \frac{c^2}{x^2}}{1 - \frac{mc^2}{x^2}} = 1 \Rightarrow m = \frac{dy}{dx} = \frac{x^2 - c^2}{x^2 + c^2}$

87. $y = ax^2 + bx + c \Rightarrow y_3 = 0$

88. $y^2 = 4a(x+h)$

89. Take $x^2 + (y-b)^2 = r^2$

90. Take $(x-a)^2 + y^2 = r^2$

91. $\frac{by^2}{2} - \frac{ax^2}{2} + ky - hx - c = 0\, for\ a = 0\, b \neq 0$

represents parabola

93. Take $x^2 + y^2 - 2ax = 0$

95. I.F = $e^{ax}, ye^{ax} = \int e^{(a+m)x} dx + c$

96. $y = mx + c\ and\ c = 1$

LEVEL - IV
NEW PATTERN QUESTIONS

1. Assertion(A): The solution of the equation $xdx + ydy = \frac{xdy - ydx}{x^2 + y^2}$ is

$2\tan^{-1}\frac{y}{x} = x^2 + y^2 + c$

Reason(R): $d\left(Tan^{-1}\frac{y}{x}\right) = \frac{xdy - ydx}{xy}$

1. A and R both are true and R is correct explanation of A
2. A and R both are true but R is not the correct explanation of A
3. Only A is true
4. Only R is true

2. Assertion(A): The general solution of $\frac{dy}{dx} - \frac{2}{x+1}y = (x+1)^3$ is $\frac{2y}{(x+1)^2} = (x+1)^2 + c$

Reason(R): general solution of D.E is $y(I.F) = \int Q(I.F)dx$

1. A and R both are true and R is correct explanation of A
2. A and R both are true but R is not the correct explanation of A
3. Only A is true
4. Only R is true

3. Assertion(A): The elimination of two arbitrary constants in $y = a + bx$ results into a differential equation of the first order $x\frac{dy}{dx} = y$.

Reason(R): Elimination of n orbitarary constants results a differential equation of the nth order.

1. A and R both are true and R is correct explanation of A
2. A and R both are true but R is not the correct explanation of A
3. Only A is true
4. Only R is true

4. Assertion(A): In the differential equation $\frac{dy}{dx} + Py = Q$. P and Q are functions of x only.

Reason(R): The solution of D.E requires the I.F $\int_e Pdx$.

1. A and R both are true and R is correct explanation of A
2. A and R both are true but R is not the correct explanation of A
3. Only A is true
4. Only R is true

5. Match the following

List-I	List-II
1. The solution of D.E $(e^y + 1)\cos x dx + e^y \sin x dy = 0$ which passes through $\left(\frac{\pi}{6}, 0\right)$ is	a) $y = ce^{x/k}$
2. Equation of the curve whose length of subtangent is K is	b) $(1, -2)$
3. The general solution of $x\log x\frac{dy}{dx} + y = 1$ is	c) $(y-1)\log x = c$
4. The point to which the origin is to be shifted to convert the equation $(3x + 4y - 5)dx = (2x + 3y + 4)dy$ as a homogenious equation is	d) $(-1, 2)$
	e) $(1 + e^y)\sin x = 1$

	1	2	3	4
1.	b	c	a	d
2.	e	a	c	b
3.	a	b	c	d
4.	e	a	d	c

6. Match the following

List-I	List-II
The D.E's Of	
A) $y = Ae^x + Be^{-x}$ (A,B arbitarary constants)	1. $y_2 + m^2 y = 0$
B) $y = a\sin px + b\cos px$ (a,b arbitarary constants)	2. $y_3 = 0$
C) $y = ax^2 + bx + c$ (a,b,c arbitarary constants)	3. $y_2 - y = 0$
D) $y = a\sin(mx + b)$ (a,b arbitarary constants)	4. $y_2 + p^2 y = 0$
	5. $y_2 - m^2 y = 0$

	A	B	C	D
1.	5	2	3	4
2.	2	3	4	5
3.	4	3	2	1
4.	3	4	2	1

7. Match the following
The Integrating factor of the D.E

List-I	List-II
A) $\frac{dy}{dx} - y\cot x = \cos ecx$	1. $x\sin x$
B) $x\log x\frac{dy}{dx} + y = 2\log x$	2. xe^x
C) $x\sin x\frac{dy}{dx} + y(x\cos x + \sin x) = \sin x$	3. $\cos ecx$
D) $x\frac{dy}{dx} + y(1+x) = 1$	4. $-\cos ecx$
	5. $\log x$

	A	B	C	D
1.	3	5	1	4
2.	3	5	1	2
3.	3	1	5	4
4.	2	3	4	5

8. Match the following

Differential equations	Its solutions
a) $yy_1 = \sec^2 x$	1. $y\sec^2 x = \sec x + c$
b) $y_1 = x\sec y$	2. $xy = \cos y + c$
c) $y_1 + (2y\tan x) = \sin x$	3. $xy = \sin x + c$
d) $xy_1 + y = \cos x$	4. $y^2 = 2\tan x + c$
	5. $x^2 = 2\sin y + c$

	a	b	c	d
1.	3	2	5	4
2.	4	1	2	3
3.	4	5	1	3
4.	3	5	1	2

9. Match the following

List-I	List-II
a) A straight line with slope 2	1) $y_3 = 0$
b) Parabola whose axis is parallel to y- axis	2) $xdy + ydx = 0$
c) Rectangular hyperbola whose assymptotes are $xy=0$	3) $y\log y = xy_1$
d) Statisfying the curve $y = e^{cx}$	4) $\frac{dy}{dx} = 2$

	a	b	c	d
1.	1	3	4	2
2.	4	3	2	1
3.	1	2	3	4
4.	4	1	2	3

10. I. The solution of D.E $(x + 2y^3)\frac{dy}{dx} = y$ is $x = y^3 + cy$.

II. The solution of D.E $\frac{dy}{dx} + y\tan x = \cos^2 x$ is $y\sec x = c + \sin x$.

Which of the above statements is true

1. only I
2. only II
3. Both I and II
4. Neither I nor II

11. I. The integrating factor of D.E $1 + (x\tan y - \sec y)\frac{dy}{dx} = 0$ is $\sec y$

II. The I.F of differential equation $x(x-1)\frac{dy}{dx} - y = x^2(x-1)^2$ is $\frac{x-1}{x}$

Which of the above are correct

1. only I 2. only II
3. Both I and II 4. Neither I nor II

12. I. The solution of $\left(1+x^2\right)dy = xydx$ is $y = c\sqrt{1+x^2}$.

II. The solution of $y\frac{dy}{dx}+x=1$ is $y^2=\left(1-x\right)^2$

Which of the above statements is correct

1. only I 2. only II
3. Both I and II 4. Neither I nor II

13. The arrangement of the following D.E in descending order of their degrees

A) $y=\sqrt{1+y_1^{\,2}}$

B) $\left(y_1+y\right)^{2/3}=xy_2$

C) $y_2=y$

D) $\left(1+\left(y_1\right)^3\right)^{1/4}=y_2$

1. C,A,B,D 2. D,B,C,A
3. D,B,A,C 4. C,B,A,D

14. The order of the D.E in ascending order when their solutions given as

A). $y=A\cos 2x+B\sin 3x$

B) $Tan^{-1}x+Tan^{-1}y=c$

C) $y=c_1e^{2x}+c_2e^{-3x}+c_3e^{x}$

D) $y=Ax^3+Bx^2+Cx+D$

1. B,A,C,D 2. A,B,D,C
3. D,C,A,B 4. B,A,D,C

15. The general solution of $\frac{dy}{dx}=\frac{ax+h}{by+k}$ represents a parabola where

a) $a=0, b=0$

b) $a=1, b=2$

c) $a=0, b\neq 0$

1. both a, b are correct
2. only a is correct
3. only b is correct
4. only c is correct

KEY

1. 1	2. 1	3. 4	4. 1	5. 2
6. 4	7. 2	8. 3	9. 4	10. 3
11. 1	12. 1	13. 3	14. 1	15. 4

LEVEL - V

COMPREHENSIVE QUESTIONS

I. $\frac{dy}{dx}=\frac{ax+by+c}{a^1x+b^1y+c^1}$ is called a non-homogeneous first order differential equations.

I. If $\frac{a}{a^1}=\frac{b}{b^1}$ then by taking ax + by = z. Then the equation changes to variable seperable.

II. If $\frac{a}{a^1}\neq\frac{b}{b^1}$ and $a^1+b=0$ then its solution is in the form $a^1xy+\frac{b^1y^2}{2}-\frac{ax^2}{2}-c_1x-c_2y=k$ where k is a constant.

1. The solution of $\frac{dy}{dx}=\frac{x+y+1}{x+y-1}$ is

1. $e^{y-x}=c\left(x+y\right)$ 2. $e^{y-x}=c\left(x-y\right)$
3. $e^{y+x}=c\left(x+y\right)$ 4. $e^{y-x}=c\left(2x+y\right)$

2. The solution of $\frac{dy}{dx}=\frac{2x-y}{2y-x}$ is

1. $\left(y+x\right)\left(y+x\right)^3=cx^4e^{-4x}$
2. $\left(y-x\right)\left(y+x\right)^3=cx^4e^{-4x}$
3. $\left(y-x\right)^4=cx^4e^{-4x}$
4. $\left(y+x\right)\left(y-x\right)^3=cx^4e^{-4x}$

3. The solution of $\frac{dy}{dx}=\frac{x-2y+1}{2x-4y}$ is

1. $\left(x-2y\right)^2-2x=c$
2. $\left(x-2y\right)^2+2x=c$
3. $\left(x+2y\right)^2+2x=c$
4. $\left(x-2y\right)^2-2x=c$

4. The solution of $\frac{dy}{dx}=\frac{x-y}{x+y}$ is

1. $x^2-2xy-y^2=c$ 2. $x^2-2xy+y^2=c$
3. $x^2+2xy-y^2=c$ 4. $x^2+2xy+y^2=c$

II. $\frac{dy}{dx}+py=Q$ where P & Q are functions of x is called a linear differential equation. Its integrating factor is $e^{\int P(x)dx}$ and its solution is $y(I.F)=\int Q(I.F)dx$

$\frac{dx}{dy}+xP(y)=Q(y)$ is called a linear differential equation. Its integrating factor is $e^{\int Pdy}$ and its general solution is $x(I.F)=\int Q(I.F)dy$.

1. Integrating factor of $x\frac{dy}{dx}-\frac{2}{x+1}y=(x+1)$ is

1. cos x 2. log secx
3. secx 4. $(x+1)^{-2}$

2. The solution of $\frac{dy}{dx}+\frac{3x^2y}{1+x^3}=\frac{\sin^2 x}{1+x^3}$ is

1. $2y(1+x^3)=x+\sin x\cos x+c$
2. $2y(1-x^3)=x+\sin x\cos x+c$
3. $2y(1+x^3)=x-\sin x\cos x+c$
4. $2y(1-x^3)=x-\sin x\cos x+c$

3. The integrating factor of $\frac{dx}{dy}+x\tan y=y$ is

1. secy 2. cosecy 3. tany 4. coty

4. The solution of $(x+2y^3)\frac{dy}{dx}=y$ is

1. $\frac{x}{y}=y+c$ 2. $\frac{x}{y}=y^2+c$
3. $\frac{x}{y}=y^3+c$ 4. $\frac{y}{x}=y^2+c$

KEY

I	1. 1	2. 2	3. 2	4. 1
II	1. 4	2. 3	3. 1	4. 2

PREVIOUS EAMCET QUESTIONS

1. $dx+dy=(x+y)(dx-dy)\Rightarrow \log(x+y)=$ (2005)

1. x + y + c 2. x + 2y + c
3. x - y + c 4. 2x + y + c

2. $3x^2y+x^3\frac{dy}{dx}=3\cos x\Rightarrow x^3y=$ (2005)

1. $\sin x$ 2. $2\sin x+c$
3. $3\sin x+c$ 4. $3\cos x+c$

3. Observe the following statements:
I: $dy+2xy\,dx=2e^{-x^2}dx\Rightarrow ye^{x^2}=2x+c$
II : $ye^{x^2}+2x=c\Rightarrow dx=\left(2e^{x^2}-2xy\right)dy$
which of the following is correct statement? (2005)

1. Both I, II are true 2. Neither I nor II
3. I is true II is false 4. I is false II is true

4. $\frac{dy}{dx}=\frac{y+x\tan\left(\frac{y}{x}\right)}{x}\Rightarrow \sin\frac{y}{x}=$ (2005

1. cx^2 2. cx 3. cx^3 4. cx^4

5. Integrating factor of $(x+2y^3)\frac{dy}{dx}=y^2$ (2004)

1. $e^{1/y}$ 2. $e^{-1/y}$ 3. $3y$ 4. $-\frac{1}{y}$

6. D.E of $y=Ae^x+Be^{2x}+Ce^{3x}$ is (2004)

1. $y_3-6y_2+11y_1-6y=0$
2. $y_3+6y_2+11y_1+6y=0$
3. $y_3-6y_2+11y_1+6y=0$
4. $y_3-6y_2-11y_1-6y=0$

7. Assertion(A): I.F of $\frac{dy}{dx}+y=x^2$ is e^x
Reason(R): $\frac{dy}{dx}+p(x).y=Q(x)$, I.F is $e^{\int p(x)dx}$
Which one of the above is true (2004)

1. A true, R false 2. A false, R true
3. A true, R true 4. A false, R false

8. D.E of the parabolas having hereby *x*-axis as axes and origin as focus is (2003)

1. $y\left(\frac{dy}{dx}\right)^2+4x\frac{dy}{dx}=4$ 2. $2x\frac{dy}{dx}-y=0$
3. $y\left(\frac{dy}{dx}\right)^2+y=2xy\frac{dy}{dx}$ 4. $y\left(\frac{dy}{dx}\right)^2+2x\frac{dy}{dx}-y=0$

9. Solution of $\frac{dy}{dx}=\frac{x\log x^2+x}{\sin y+y\cos y}$ (2003)

1. $y\sin y=x^2\log x+c$
2. $y\sin y=x^2+c$
3. $y\sin y=x^2+\log x+c$
4. $y\sin y=x\log x+c$

10. Solution of $y^2dx+\left(x^2-xy+y^2\right)dy=0$ (2003)

1. $Tan^{-1}\left(\frac{x}{y}\right)-\log x+c=0$
2. $2Tan^{-1}\left(\frac{x}{y}\right)+\log x+c=0$
3. $\log\left(y+\sqrt{x^2+y^2}\right)+\log y+c=0$
4. $\sinh^{-1}\left(\frac{x}{y}\right)+\log y+c=0$

11. The solution of $\frac{dy}{dx}=\left(\frac{y}{x}\right)^{1/3}$ is (2002)

1. $x^{2/3}+y^{2/3}=c$ 2. $y^{2/3}-x^{2/3}=c$
3. $x^{1/3}+y^{1/3}=c$ 4. $y^{1/3}-x^{1/3}=c$

12. $y+x^2=\frac{dy}{dx}$ has the solution (2002)

1. $y+x^2+2x+2=c.e^x$
2. $y+x+2x^2+2=c.e^x$
3. $y+x+x^2+2=c.e^{2x}$
4. $y^2+x+x^2+2=c.e^{2x}$

13. The solution of $\frac{dy}{dx}+\frac{y}{3}=1$ is (2002)

1. $y=3+c.e^{x/3}$ 2. $y=3+c.e^{-x/3}$
3. $3y=c+e^{x/3}$ 4. $3y=c+e^{-x/3}$

14. The solution of $\frac{dy}{dx}+y=e^x$ is (2001)

1. $2y=e^{2x}+c$ 2. $2ye^x=e^x+c$
3. $2ye^x=e^{2x}+c$ 4. $2ye^{2x}=2e^x+c$

15. The solution of $x^2+y^2.\frac{dy}{dx}=4$ is (2001)

1. $x^2+y^2=12x+c$ 2. $x^2+y^2=3x+c$
3. $x^3+y^3=3x+c$ 4. $x^3+y^3=12x+c$

16. The family of curves in which the subtangent at any point to any curve is double the abscissa, is given by (2001)

1. $x=cy^2$ 2. $y=cx^2$ 3. $x^2=cy^2$ 4. $y=cx$

17. The solution of $xdx+ydy=x^2ydy-xy^2dx$ is (2001)

1. $x^2-1=c\left(1+y^2\right)$ 2. $x^2+1=c\left(1-y^2\right)$
3. $x^3-1=c\left(1+y^3\right)$ 4. $x^3+1=c\left(1-y^3\right)$

18. The equation of the curve passing through the origin and satisfying the differential equation $\frac{dy}{dx}=(x-y)^2$ is (2000)

1. $e^{2x}(1-x+y)=1+x-y$
2. $e^{2x}(1+x-y)=1-x+y$
3. $e^{2x}(1+x-y)=-(1+x+y)$
4. $e^{2x}(1+x+y)=1-x+y$

19. If c is a parameter, then the differential eqution whose solution is $y=c^2+\frac{c}{x}$ is (2000)

1. $y=x^4\left(\frac{dy}{dx}\right)-x\left(\frac{dy}{dx}\right)^2$
2. $y=x^4\left(\frac{dy}{dx}\right)^2+x\left(\frac{dy}{dx}\right)$
3. $y=x^4\left(\frac{dy}{dx}\right)^2-x\left(\frac{dy}{dx}\right)$
4. $y=x^4\left(\frac{d^2y}{dx^2}\right)-x\left(\frac{dy}{dx}\right)$

20. The solution of $2xy\frac{dy}{dx}=1+y^2$ is (1999)

1. $1+y^2=cx$ 2. $1-y^2=cx$
3. $1+x^2=cy$ 4. $1-x^2=cy$

21. The order of differential equation $\left(\frac{dy}{dx}\right)^3+\left(\frac{dy}{dx}\right)^2+y^4=0$ (1999)

1. 4 2. 3 3. 1 4. 2

22. The general solution of the differential equation $\frac{dy}{dx}-\frac{2xy}{1+x^2}=0$ is (1998)

1. $y=A\left(1+x^2\right)$ 2. $y=A\sqrt{1+x^2}$
3. $y=\frac{A}{1+x^2}$ 4. $y=\frac{A}{\sqrt{1+x^2}}$

23. Solution of the differential equation $\frac{dy}{dx}=(1+y^2)(1+x^2)^{-1}$ (1997)

1. $y-x=c(1+xy)$
2. $y+x=c(1+xy)$
3. $y+x=c(1-xy)$
4. $y-x=c(1-xy)$

24. If $y=A+Bx^2$ then (1995)

1. $\frac{d^2y}{dx^2}=2xy$
2. $x\frac{d^2y}{dx^2}=y_1$
3. $x\frac{d^2y}{dx^2}-\frac{dy}{dx}+y=0$
4. $x\frac{d^2y}{dx^2}+\frac{dy}{dx}+y=0$

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77. The differential equation obtained by eliminating the arbitary constants 'a' and 'b' from $xy=ae^x+be^{-x}$ is

1) $x\frac{d^2y}{dx^2}+2\frac{dy}{dx}-xy=0$

2) $\frac{d^2y}{dx^2}+2y\frac{dy}{dx}-xy=0$

3) $x\frac{d^2y}{dx^2}+2\frac{dy}{dx}-y=0$

4) $\frac{d^2y}{dx^2}+\frac{dy}{dx}-xy=0$

78. The solution of $(x+y+1)\frac{dy}{dx}=1$

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1) $y=(x+1)+ce^x$

2) $y=(x+2)+ce^x$

3) $x=-(y+2)+ce^y$

4) $x=(y+2)^2+ce^y$

79. The solution of $\frac{dy}{dx}=\frac{y^2}{xy-x^2} is$ **E-2007**

1) $e^{y/x}=kx$ 2) $e^{y/x}-ky$

3) $e^{y/x}=kx$ 4) $e^{-y/x}=ky$

80. The solution of $\frac{dy}{dx}+1=e^{x+y}$ is **E-2007**

1) $e^{-(x+y)}+x+c=0$

2) $e^{-(x+y)}-x+c=0$

3) $e^{x+y}+x+c=0$

4) $e^{x+y}-x+c=0$

KEY

1. 3	2. 3	3. 3	4. 2	5. 1
6. 1	7. 3	8. 4	9. 1	10. 1
11. 2	12. 1	13. 2	14. 3	15. 4
16. 1	17. 1	18. 1	19. 3	20. 1
21. 3	22. 1	23. 1	24. 2	25.1
26. 3	27. 2	28. 1		