1. The family of curves with differential equation $\frac{dy}{dx} + \frac{\sqrt{1+y^2}}{\sqrt{1+y^2}} = 0$ is
   (a) $\sinh^{-1}x + sinh^{-1}$y=c
   (b) $\sin^{-1}x + sin^{-1}$y=c
   (c) $\sin^{-1}x - sin^{-1}y$ =c
   (d) $\sinh^{-1}x - sinh^{-1}$y=c
2. The general solution of exact equation Mdx+Ndy=0 is
   (a) $\int_{y-const} Mdx + \int (termsofMnotcontaingx)dy = c$
   (b) $\int_{y-const} Mdx \int (termsofNnotcontaingx)dy = c$
   (c) $\int (Mdx + Ndy) = c$
   (d) $\int_{y-const} Mdx + \int_{x-const} Ndy = c$
3. An I.F. of $(x^2y - 2xy^2)dx - (x^3 - 3x^2y)dy=0$ is
   (a) x^2y^2
   (b) $\frac{1}{x^2y^2}$
   (c) $-\frac{1}{x^2y^2}$
   (d) $2x^3y_5x^2y^2$
4. The general solution of $\frac{ydx-xdx}{y^2} + xe^x dx = 0\ is$
   (a) x+(x-1)ye^x=c
   (b) $\frac{y}{x} + (x-1)e^x = c$
   (c) $\frac{x}{y} + (x-1)e^x = c$
   (d) y+x(x-1)e^x=c
5. An I.F.of (x-y)dx-dy = 0 is
   (a) x
   (b) $\frac{1}{x}$
   (c) e^{-x}
   (d) e^x
6. The general solution of $y^1 + 2xy = e^{-x^2}$ is
   (a) $e^{x^2} = yx + c$
   (b) $ye^{x^2} = x + c$
   (c) $y = xe^{x^2} + c$
   (d) $x = ye^{x^2} + ce^{-x^2}$
7. The general solution of $(1+y^2)dx = (tan^{-1}$y-x)dy is
   (a) $x = \tan^{-1} + 1 + ce^{-\tan^{-1}}y$
   (b) $y = \tan^{-1} y - 1 + ce^{-\tan^{-1}}y$
   (c) $x = \tan^{-1} y - 1 + c$
   (d) $x = \tan^{-1} y - 1 + ce^{-\tan^{-1}}y$
8. An I.F. of $x\frac{dy}{dx} + y = x^3y^6$ is
   (a) y^5
   (b) y^{-5}
   (c) x^{-5}
   (d) x^5
9. The temperature of a body initially at 80^0 C reduce to 60^0 C in 12 min. If the temperature of the surrounding air is 30^0 C, find the temperature of the body after 24 min.
   (a) 45^0 C
   (b) 40^0 C
   (c) 46^0 C
   (d) 48^0 C
10. The D.E. of orthogonal trajectoreies of the family of curves $ay^2 = x^3$. where a is parameter is
    (a) $3x\frac{dy}{dx} + 2x = 0$
    (b) $3x\frac{dx}{dy} + 2y = 0$
    (c) $3x\frac{dy}{dx} + 2y = 0$
    (d) $3y\frac{dx}{dy} + 2x = 0$
11. The complete solution of (D^2-1) y=ois y=
    (a) $c_1e^x + c_2e^{-x}$
    (b) $(c_1 + c_2x)\cos x$
    (c) $(c_1 + c_2x)e^x$
    (d) $c_1\cos x + c_2\sin x$
12. Auxiliary equation of $\frac{d^3y}{dx^3} = \frac{dy}{dx}$ has
    (a) Two equal real roots
    (b) One real and a pair of complex roots.
    (c) Unequal roots
    (d) Repeated roots
13. The paritular value of $\frac{1}{D+1}$ x=
    (a) x+1
    (b) $x^2 - 1$
    (c) x-1
    (d) $x^2 + 1$
14. The P.I. of (D^2+5D+6)y=e^x is
    (a) $\frac{e^x}{6}$
    (b) $\frac{e^x}{12}$
    (c) $\frac{-e^x}{6}$
    (d) $\frac{-e^x}{12}$
15. The P.I. of $(D-2)^2$y=8sin2x is
    (a) cos2x
    (b) $\frac{-1}{8}$cos2x
    (c) -cos2x
    (d) $\frac{1}{8}$cos2x
16. The P.I. of $(D^2 + a^2)$y=cosax is
    (a) $\frac{x\cos ax}{a}$
    (b) $\frac{x\sin ax}{2}$
    (c) $\frac{-x\cos ax}{2a}$
    (d) $\frac{x\sin ax}{2a}$
17. The P.I. of $\frac{1}{D-2}2^x$
    (a) $\frac{2^x}{\log 2+2}$
    (b) $\frac{2^x}{\log 2-2}$
    (c) $\frac{2^x}{x\log 2-2}$
    (d) $\frac{2^x}{x\log +2}$
18. V is function of x, $\frac{1}{f(D)}e^{ax}V$=
    (a) $e^{ax}\frac{1}{f(a)}V$
    (b) $e^{ax}\frac{1}{f(D)}V$
    (c) $e^{ax}\frac{1}{f(D+a)}V$
    (d) $e^{ax}\frac{1}{f(D-a)}V$
19. The C.F. of $(D^3 - 3D^2 - 6D + 8)y = xe^{-3x}$ is
    (a) $c_1e^x + c_2e^{4x} + c_3e^{-2x}$
    (b) $c_1e^{-2x} + c_2e^x + c_3e^{-4x}$
    (c) $c_1e^x + c_2e^{-2x} + c_3e^{-4x}$
    (d) $c_1e^{-2x} + c_2e^{-x} + c_3e^{4x}$
20. Given $(D^2 + a^2)$y = sec ax, By the method of variationof parameters P.I = A cos ax +B sin ax then A =
    (a) -log (cos ax)
    (b) $\frac{1}{a^2}\log(\cos ax)$
    (c) log (cos ax)
    (d) $-\frac{1}{a^2}\log(\cos ax)$