1. The number of arbitrary constant in a general solution of a D.E. of order n is
   (a) n+1
   (b) n-1
   (c) n+2
   (d) n
2. The general solution of $(x^2 - ay)dx = (ax - y^2)dy$ is
   (a) $\frac{x^3}{3} + axy + \frac{y^3}{3} = c$
   (b) $\frac{x^3}{3} + axy - y^3 = c$
   (c) $\frac{x^3}{3} + axy - \frac{y^3}{3} = c$
   (d) $\frac{x^3}{3} - axy + \frac{y^3}{3} = c$
3. Which of the following is an intergrating factor of $ydx-xdy+3x^2y^2e^{x^3}dx=0$?
   (a) $\frac{1}{y^2}$
   (b) x^2
   (c) $\frac{1}{x^2}$
   (d) y^2
4. An >I.F. of (xy sinxy+cosxy)ydx+(xysinxy-cosxy)xdy=0 is
   (a) $\frac{1}{2xy\cos xy}$
   (b) $\frac{1}{2xy\sin xy}$
   (c) 2xysinxy
   (d) 2xycosxy
5. An I.F.of (x-y)dx-dy = 0 is
   (a) e^{-x}
   (b) $\frac{1}{x}$
   (c) x
   (d) e^{x}
6. An integrating factor of $x\log x\frac{dy}{dx} + y = 2\log x$ is
   (a) e^{logx}
   (b) log(logx)
   (c) $\frac{1}{x\log x}$
   (d) logx
7. The general solution of $(1+y^2)dx = (tan^{-1}y-x)dy$ is
   (a) $y = \tan^{-1}y - 1 + ce^{-\tan^{-1}}y$
   (b) $x = \tan^{-1}y - 1 + c$
   (c) $x = \tan^{-1} + 1 + ce^{-\tan^{-1}}y$
   (d) $x = \tan^{-1}y - 1 + ce^{-\tan^{-1}}y$
8. An I.F. of $\frac{dy}{dx} - y\tan x = -y^2\sec x$ is
   (a) secx
   (b) sinx
   (c) cosecx
   (d) cosx
9. The rate at which bacteria multiply is proportional to the instantanous number present. If the original number doubles in 2 hr, in how many hours will it triple?
   (a) $\frac{2\log 3}{\log 2}$ hrs
   (b) $\frac{\log 3}{\log 2}$ hrs
   (c) $\frac{\log 2}{\log 3}$ hrs
   (d) $\frac{2\log 2}{\log 3}$ hrs
10. The D.E. of orthogonal trajectories of the family of curves $y^2 = 4ax$, where a is the parameter is
    (a) $y\frac{dy}{dx} = -2x$
    (b) $x\frac{dy}{dx} = 2y$
    (c) $y\frac{dy}{dx} = 2x$
    (d) $x\frac{dy}{dx} = -2y$
11. $y = e^{-x}\left[c_1\cos\sqrt{3}x + c_2\sin\sqrt{3}x\right] + c_3e^{2x}$ is the general solution of
    (a) $y^{111} + 4y = 0$
    (b) $y^{111} + 8y = 0$
    (c) $y^{111} - 8y = 0$
    (d) $y^{111} - 2y^{11} + y^1 - 2y = 0$
12. $y=(c_1 + c_2x)e^x + c_3e^{-2x}$ is the general solution of
    (a) $\frac{d^3y}{dx^3} + 3\frac{dy}{dx} - 2y = 0$
    (b) $\frac{d^3y}{dx^3} + 3\frac{dy}{dx} + 2y = 0$
    (c) $\frac{d^3y}{dx^3} - 3\frac{dy}{dx} - 2y = 0$
    (d) $\frac{d^3y}{dx^3} - 3\frac{dy}{dx} + 2y = 0$
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 $(D+2)(D-1)^2y=e^{-2x}$ is
    (a) $\frac{-xe^{-2x}}{9}$
    (b) $\frac{x^2e^{-2x}}{9}$
    (c) $\frac{e^{-2x}}{9}$
    (d) $\frac{xe^{-2x}}{9}$
15. The P.I. of $(D-2)^2y=8\sin 2x$ is
    (a) cos2x
    (b) $\frac{-1}{8}\cos 2x$
    (c) -cos2x
    (d) $\frac{1}{8}\cos 2x$
16. The P.I. of $(D^2+1)y=\cos x$ is
    (a) $\frac{-\cos x}{2}$
    (b) $\frac{-x\sin x}{2}$
    (c) $\frac{-x\cos x}{2}$
    (d) $\frac{x\sin x}{2}$
17. The P.I. of $(D^3 - 1)y = x^3$ is
    (a) $-x^3 - 6$
    (b) $x^3 + 6$
    (c) $x^3 - 6$
    (d) $-(x^3 - 6)$
18. $\frac{1}{(D-2)^2}xe^{2x}=$
    (a) x^3e^{2x}
    (b) $\frac{x^2e^{2x}}{2}$
    (c) $\frac{x^3e^{2x}}{6}$
    (d) $\frac{x^3e^{2x}}{12}$
19. The C.F. of $(D^3 - 3D^2 - 6D + 8)y = xe^{-3x}$ is
    (a) $c_1e^{-2x} + c_2e^{-x} + c_3e^{4x}$
    (b) $c_1e^{x} + c_2e^{4x} + c_3e^{-2x}$
    (c) $c_1e^{-2x} + c_2e^{x} + c_3e^{-4x}$
    (d) $c_1e^{x} + c_2e^{-2x} + c_3e^{-4x}$
20. The wronskian of two functions y_1, y_2 is
    (a) $y_1, y_2 - y_2, y_1^1$
    (b) y_1, y_2^1
    (c) $y_1^1y_2 + y_2^1y_2$
    (d) $y_1, y_2^1 - y_2, y_1^1$