1. The degree of $x^3\frac{d^3y}{dx^3} - 2x\frac{d^2y}{dx^2} + \cos(\frac{dy}{dx}) = 0$ is
   (a) indeterminate
   (b) 3
   (c) 1
   (d) 2
2. The general solution of $(e^y + 1)cosxdx + e^y$sinxdy=0 is
   (a) (e^y+1)cosx=c
   (b) (e^y+1)sinx=c
   (c) (e^y+1)secx=c
   (d) (e^y+x)sinx=c
3. Which of the following is an intergrating factor of ydx-xdy+3x$^2y^2e^{x^3}$dx=0?
   (a) y^2
   (b) $\frac{1}{x^2}$
   (c) x^2
   (d) $\frac{1}{y^2}$
4. The general solution of $\frac{ydx-xdx}{y^2} + xe^xdx = 0\ is$
   (a) $\frac{x}{y} + (x-1)e^x = c$
   (b) $\frac{y}{x} + (x-1)e^x = c$
   (c) y+x(x-1)e^x=c
   (d) x+(x-1)ye^x=c
5. An I.F. of (xy$^3 + y)dx + 2(x^2y^2$+x+y)dy $= 0$ is
   (a) logy
   (b) $\frac{1}{y}$
   (c) y
   (d) x
6. The complete solution of $\frac{dy}{dx} + xy = x$ is
   (a) $y = 1 + ce^{-x^2/2}$
   (b) $y = 1 + ce^{-x^2}$
   (c) $y = 1 + ce^{+x^2/2}$
   (d) $y = ce^{-x^2/2}$
7. An I.F. of ylogydx+(x-logy)dy $= 0$ is
   (a) logy
   (b) ylogy
   (c) log(logy)
   (d) -logy
8. The general solution of $\frac{dy}{dx} - \frac{\tan y}{x+1} = (x+1)e^x \sec y$ is
   (a) siny = (1+x)(e^x+c)
   (b) sinx = (1+y)(e^x+c)
   (c) cosy = (1+x)(e^x+c)
   (d) cosx=(1+y)(e^y+c)
9. Mathematical formulation of Newton's law of cooling is
   (a) $\frac{dT}{dt} = -KT$
   (b) $\frac{dT}{dt} = -K(T + T_0)$
   (c) $\frac{dT}{dt} = k(T - T_0)$
   (d) $\frac{dT}{dt} = -K(T - T_0)$
10. In cortesian coordinate system for differential equation of orthogonal trajectory. we replace $\frac{dy}{dx}$ by
    (a) $\frac{dx}{dy}$
    (b) $-\frac{dx}{dy}$
    (c) $-x\frac{dx}{dy}$
    (d) $-\frac{dy}{dx}$
11. The C.F. of $(D^2 + 4D + 5)y = 13e^x$ is
    (a) $e^x(c_1 \cos 2x + c_2 \sin 2x)$
    (b) $e^{-2x}(c_1 \cos x + c_2 \sin x)$
    (c) $e^{2x}(c_1 \cos 2x + c_2 \sin 2x)$
    (d) $e^{2x}(c_1 \cos x + c_2 \sin x)$
12. The roots of A.E. of the D.E, for which the C.F. is $c_1e^{2x} + c_2cos2x + c_3sin2x$ are
    (a) Real and unequal
    (b) One real and a pair of complex roots
    (c) Real and equal
    (d) One real and two pair of complex roots
13. If f(D)=$D^2 - 2, \frac{1}{f(D)}e^{2x}$
    (a) $\frac{e^{2x}}{2}$
    (b) $\frac{-e^{2x}}{2}$
    (c) $-e^{2x}$
    (d) e^{2x}
14. The P.I. of $(D+2)(D-1)^2$y=e^{-2x} is
    (a) $\frac{x^2e^{-2x}}{9}$
    (b) $\frac{e^{-2x}}{9}$
    (c) $\frac{xe^{-2x}}{9}$
    (d) $\frac{-xe^{-2x}}{9}$
15. The P.I. of $\frac{1}{D^2+a^2}$ sinax=
    (a) $\frac{x}{2a}$sinax
    (b) $\frac{x}{2a} \cos ax$
    (c) $-\frac{x}{2a} \cos ax$
    (d) $\frac{x}{2a^2}$cosax
16. The C.F. of $(D^2 - 3D + 2)$y=cos3x is
    (a) $c_1 + c_2e^x$
    (b) $c_1e^{-x} + c_2e^{2x}$
    (c) $c_1e^x + c_2e^{2x}$
    (d) $c_1e^{-x} + c_2e^{-2x}$
17. The P.I. of $\frac{1}{(D+1)^2}x$=
    (a) x-2
    (b) x+2
    (c) x-1
    (d) x+1
18. $\frac{1}{(D-5)^3}e^{5x}$sinx=
    (a) $e^{5x}sinx$
    (b) $-e^{5x}cosx$
    (c) $e^{5x}cosx$
    (d) $-e^{5x}sinx$
19. The P.I, of $(D^2 - 1)$y=xsinx is
    (a) $-\frac{1}{2}$(xcosx+sinx)
    (b) $\frac{1}{2}$(xcosx+sinx)
    (c) $-\frac{1}{2}$(xsinx+cosx)
    (d) $\frac{1}{2}$(xsinx+cosx)
20. The P.I. of (D^2+4)y = tan 2x is
    (a) $-\cos 2x \int \frac{\sin 2x \tan 2x}{2}dx + \sin 2x \int \frac{\cos 2x \tan 2x}{2}dx$
    (b) $\cos 2x \int \frac{\sin 2x \tan 2x}{2}dx + \sin 2x \int \frac{\cos 2x \tan 2x dx}{2}$
    (c) $-\sin 2x \int \frac{\sin 2x \tan 2x}{2}dx + \cos 2x \int \frac{\cos 2x \tan 2x}{2}dx$
    (d) $-\cos 2x \int \sin 2x \tan 2x dx + \cos 2x \int \sin 2x \tan 2x dx$