Multiple Choice Problems

Q_c.No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer																				

Q1. The DE: $(5-2x^2)dy+(4xy+x^5+x^2)dx=0$ is
(a) Exact, (b) First order linear in x, (c) First order linear in y, (d) None of these

Q.2. Appropriate substitution to solve: $x^2y''+xy=x^2\sec^2(y/x)$ is
(a) $u=\sec^2(y/x)$, (b) $y=ux$, (c) $x=uy$, (d) None of these

Q.3. The DE: $y'=\sqrt{y-5}$ has a unique solution passing through the point
(a) (0,6), (b) (-2,1), (c) (2,4), (d) None of these

Q.4. The DE for the orthogonal trajectories of the family of curves: $y=c\ln x$ is
(a) $yy'-x\ln x=0$, (b) $xy'=c$, (c) $yy'+x\ln x=0$, (d) None of these

Q.5. The DE $(4x+5y)dx=-N(x,y)dy$ is exact, if $N(x,y)$ is
(a) $4y-5x$, (b) $8y^2-4x$, (c) $5x-4y$, (d) None of these.

Q.6. For the DE: $ydx+(3+3x-y)dy=0$
(a) y^2 is the integrating factor, (b) x^3 is the integrating factor, (c) $2y^4$ is the integrating factor,
(d) None of these.

Q.7. In Bernoulli's DE: $x^2y'-3y^4=2xy$ the value of n is:
(a) 4, (b) 1, (c) 2, (d) 3

Q.8. The DE: $x^2dy=(x^3y+y^{3/2})dx$: is
(a) First order linear equation, (b) Exact equation, (c) Bernoulli equation, (d) None of these

Q.9. If $f(x)=x^3$ and $g(x)=4-5mx$ are orthogonal functions on [0,1], then m is:
(a) 0, (b) -1, (c) 1, (d) None of these

Q.10. If $f(x)$ and $g(x)$ are linearly independent on $(-\infty,\infty)$ and $(A+2)f(x)+(B-3)g(x)=0$, then (A,B) is:
(a) (-2,3), (b) (2,-3), (c) (2,3), (d) None of these

Q.11. Suppose that a population P grows at a rate proportional to the square of the population present at time t, the DE of the model is:
(a) $\frac{dp}{dt}=-kp^2$, (b) $\frac{dp}{dt}=-kt$, (c) $\frac{dp}{dt}=kt$, (d) $\frac{dp}{dt}=kp^2$

Q.12. Suppose the amount x of a substance decays at a rate proportional to the amount present at time t. The DE that models this is

(a) $\frac{dx}{dt} = -kx$, (b) $\frac{dx}{dt} = kt$, (c) $\frac{dx}{dt} = -kt$, (d) $\frac{dx}{dt} = kx$

Q.13. If the roots of the characteristic equation are: 0, -2, 3, the DE is:

(a) $y'(y''-y'-6) = 0$, (b) $y'''-y''-6y' = 0$, (c) $y''-y'-6 = 0$, (d) None of these

Q.14. If $y = xe^{-3x}$ is a solution of a second order linear homogeneous equation with constant coefficients, then another solution must be

(a) $y = xe^{3x}$, (b) $y = x$, (c) $y = e^{-3x}$, (d) $y = x^2e^{-3x}$

Q.15. The simplest form of the particular solution of the DE $y''-2y'-8y = 12e^{4x}$ is

(a) $y_p = Ax^2e^{-2x}$, (b) $y_p = Ae^{4x}$, (c) $y_p = Axe^{4x}$, (d) $y_p = Axe^{-2x}$

Q.16. The simplest form of the particular solution of the DE $y''+y = \cos(2x)$ is

(a) $y_p = A\sin(2x)$, (b) $y_p = A\cos(2x) + B\sin(2x)$, (c) $y_p = Ax\cos(2x) + Bx\sin(2x),$, (d) None of these.

Q.17. An ordinary point of the differential equation $(1-x^2)y'' + xy' = \sin x$ is

(a) $x = 1/2$ (b) $x = -1$, (c) $x = 1$, (d) None of these

Q.18. If a function f is defined by $f(x) = \sin^2 x + |\sin x|$ on $(-\infty, \infty)$, then

(a) $\int_{-a}^{a} f(x)dx = \int_{0}^{a} f(x)dx$, (b) $\int_{-a}^{a} f(x)dx = 0$, (c) $\int_{-a}^{a} f(x)dx = 2\int_{0}^{a} f(x)dx$, (d) None of these

Q.19. The function $\cos x - |x\sin x| + 1$ is an

(a) neither even nor odd even function, (b) odd function, (c) even function, (d) None of these

Q.20. If a_n, b_n are the Fourier coefficients of an odd function, then

(a) $a_n = 0$, for $n \geq 0$, (b) $a_n = 0$, for $n > 1$, (c) $b_n = 0$, for $n \geq 1$, (d) None of these