**Differential Equations**

**MCQ-Single Correct**

1. If  and y(0) = 1 , then  is equal to :

(1) 1/3 (2) -2/3

(3) -1/3 (4) 4/3 **[2017]**

2. If a curve y = f(x) passes through the point ( 1 , -1 ) and satisfies the differential equation,

y(1 + xy) dx = x dy , then  is equal to :

1. - 4/5 (2) 2/5

(3) 4/5 (4) -2/5 **[2016]**

3. Let y(x) be the solution of the differential equation  , . Then y(e) is equal to :

(1) 0 (2) 2

(3) 2e (4) e **[2015]**

4. Let the population of rabbits surviving at a time t be governed by the differential equation  If p(0) = 100, then p(t) equals

(1) 400 – 300et/2 (2) 300 – 200e-t/2

(3) 600 – 500et/2 (4) 400 – 300e-t/2 **[2014]**

5. At present, a firm is manufacturing 2000 items. It is estimated that the rate of change of production P w.r.t. additional number of workers x is given by . If the firm employs 25 more workers, then the new level of production of items is

(1) 3000 (2) 3500

(3) 4500 (4) 2500 **[2013]**

6. A spherical baloon is filled with 4500 π cubic meters of helium gas. If a leak in the balloon causes the gas to escape at the rate of 72 π cubic metres per minute, then the rate ( in meters per minute ) at which the radius of the balloon decreases 49 minutes after the leakage began is

(1) 2/9 (2) 9/2

(3) 9/7 (4) 7/9 **[2012]**

7. The population p(t) at time t of a certain mouse species satisfies the differential equation  If p(0) = 850 , then the time at which the population becomes zero is

(1)  (2) ln 18

(3) 2 ln 18 (4) ln 9. **[2012]**

8. Consider the differential equation . If y(1) = 1, then x is given by

(1)  (2) 

(3)  (4)  **[2011]**

9. Solution of the differential equation cos x dy = y(sin x – y) dx,  is

(1) y sec x = tan x + c (2) y tan x = sec x + c

(3) tan x = (sec x + c)y (4) sec x = (tan x +c)y **[2010]**

10. The differential equation which represents the family of curves  where c1 and c2 are arbitrary constants is

(1) y’ = y2 (2) y’’ = y’y

(3) yy’’ = y’ (4) yy’’ = (y’)2 **[2009]**

11. The solution of the differential equation  satisfying the condition y(1) = 1 is

(1) y = ln x + x (2) y = x ln x + x2

(3) y = xe(x-1) (4) y = x ln x + x **[2008]**

12. The differential equation of the family of circles with fixed radius 5 units and centre on the line y = 2 is

(1) (x-2)y’2 = 25 – (y-2)2 (2) (y-2)y’2 = 25 - (y-2)2

(3) (y-2)2y’2 = 25 – (y-2)2 (4) (x-2)2y’2 = 25 – (y-2)2 **[2008]**

13. The normal to a curve at P(x,y) meets the x-axis at G. If the distance of G from the origin is twice the abscissa of P, then the curve is

(1) an ellipse (2) a parabola

(3) a circle (4) a hyperbola **[2007]**

14. The differential equation of all circles passing through the origin and having their centres on the x-axis is

(1)  (2) 

(3)  (4)  **[2007]**

15. The differential equation whose solution is Ax2 + By2 = 1, where A and B are arbitrary constants is of

(1) second order and second degree (2) first order and second degree

(3) first order and first degree (4) second order and first degree **[2006]**

16. The differential equation representing the family of curves y2 = 2c(x + ) , where c > 0, is a parameter, is of order and degree as follows:

(1) order 1, degree 2 (2) order 1, degree 1

(3) order 1, degree 3 (4) order 2, degree 2 **[2005]**

17. If  then the solution of the equation is

(1)  (2) 

(3)  (4)  **[2005]**

18. The differetnatial equation for the family of curves x2 + y2 -2ay = 0 , where a is an arbitrary constant is

(1) 2(x2 – y2)y’ = xy (2) 2(x2 + y2)y’ = xy

(3) (x2 – y2)y’ = 2xy (4) (x2 + y2)y’ = 2xy **[2004]**

19. The solution of the differential equation y dx + (x + x2y) dy = 0 is

(1)  (2) 

(3)  (4) logy = Cx **[2004]**

20. The degree and order of the differential equation of the family of all parabolas whose axis is x-axis, are respectively

(1) 2,1 (2) 1,2

(3) 3,2 (4) 2,3 **[2003]**

21. The solution of the differential equation , is

(1)  (2) 

(3)  (4)  **[2003]**

22. The solution of the equation 

(1)  (2) 

(3)  (4)  **[2002]**

23. The order and degree of the differential equation  are

(1) 1, 2/3 (2) 3,1

(3) 3,3 (4) 1,2 **[2002]**