Department of Mathematics

E content for B.A./B.Sc. Semester II, Paper I, Unit III (Part A)

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Multiple Choice Questions based on the order and degree of differential equations

Choose (order, degree) of the following differential equations:

1. $\frac{dy}{dx} = e^x$
   a. (1,1)
   b. (1,0)
   c. (0,1)
   d. (1,not defined)
2. $\frac{d^2y}{dx^2} + y = 0$
   a. (2,1)
   b. (2,0)
   c. (1,2)
   d. (0,2)
3. $\frac{d^3y}{dx^3} + x^2\left(\frac{d^2y}{dx^2}\right)^3 = 0$
   a. (3,1)
   b. (3,2)
   c. (3,3)
   d. (2,3)
4. $\frac{d^3y}{dx^3} + 2\left(\frac{d^2y}{dx^2}\right)^2 - \frac{dy}{dx} + y = 0$
   a. (3,2)
   b. (3,1)
   c. (3,0)
   d. (1,3)
5. $\frac{dy}{dx} - \cos x = 0$
   a. (1,1)
   b. (1,0)
   c. (0,1)
   d. (1, not defined)
6. $xy\frac{d^2y}{dx^2} + x\left(\frac{dy}{dx}\right)^2 - y\frac{dy}{dx} = 0$
   a. (2,2)
   b. (2,1)
   c. (1,2)
   d. (2, not defined)
7. $\frac{d^3y}{dx^3} + y^2 + e^{\frac{dy}{dx}} = 0$
   a. (3, not defined)
   b. (3,2)

c. (2,3)
d. (3,1)

8. $\frac{dy}{dx} + 2x^2y = 0$
   a. (1,2)
   b. (2,1)
   c. (1,1)
   d. (1,4)
9. $\frac{d^2y}{dx^2} + 3\left(\frac{dy}{dx}\right)^2 + 4x^3 = 0$
   a. (2,1)
   b. (2,2)
   c. (1,2)
   d. (2,3)
10. $\left[1 + \left(\frac{dy}{dx}\right)^2\right]^{\frac{3}{2}} = \frac{d^2y}{dx^2}$
   a. (3,2)
   b. (2,2)
   c. (2,3)
   d. (2, not defined)
11. $x^2\left(\frac{d^2y}{dx^2}\right)^3 + y\left(\frac{dy}{dx}\right)^5 + y^3 = 0$
   a. (2,3)
   b. (2,5)
   c. (3,5)
   d. (3,2)
12. $\left(\frac{d^2y}{dx^2}\right)^3 + \left(\frac{dy}{dx}\right)^2 + \sin\left(\frac{dy}{dx}\right) + 1 = 0$
   a. (2,3)
   b. (3,2)
   c. (2,1)
   d. (2, not defined)
13. $\frac{d^4y}{dx^4} + \sin\left(\frac{d^3y}{dx^3}\right) = 0$
   a. (4, not defined)
   b. (4, 3)
   c. (3, 4)
   d. (4, 1)
14. $\left(\frac{ds}{dt}\right)^4 + 3s\frac{d^2s}{dt^2} = 0$
   a. (2, 1)
   b. (4, 2)
   c. (2, 4)
   d. (1, 2)
15. $\left(\frac{d^2y}{dx^2}\right)^2 + cos\left(\frac{dy}{dx}\right) = 0$
   a. (2, 2)
   b. (2, 1)
   c. (1, 1)
   d. (2, not defined)

16. $\frac{d^2y}{dx^2} = cos3x + sin3x$
    a. (2, 1)
    b. (3, 3)
    c. (1, 2)
    d. (2, 3)
17. $\left(\frac{d^3y}{dx^3}\right)^2 + \left(\frac{d^2y}{dx^2}\right)^3 + \left(\frac{dy}{dx}\right)^4 + y^5 = 0$
    a. (2, 3)
    b. (3, 2)
    c. (3, 3)
    d. (3, 5)
18. $\frac{d^3y}{dx^3} + 2\frac{d^2y}{dx^2} + \frac{dy}{dx} = 0$
    a. (3, 1)
    b. (3, 2)
    c. (2, 1)
    d. (2, 3)
19. $\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^2 + 2y = 0$
    a. (1, 2)
    b. (2, 1)
    c. (2, 2)
    d. (2, 3)
20. $2x^2\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + y = 0$
    a. (2, 2)
    b. (2, 1)
    c. (1, 2)
    d. (0, not defined)

Answers

The **order** of a differential equation is the order of highest order derivative occurring in the equation and **degree** of the differential equation is the degree of highest order derivative occurring in it with the condition that the derivatives are free from radicals and fractions.

1.a 2.a 3.a 4.b 5.a 6.b 7.a 8.c 9.a 10.b

11.a 12.d 13.a 14.a 15.d 16.a 17.b 18.a 19.b 20.b

Note:1. In question no.7 degree is not defined due to the term $e^{\frac{dy}{dx}}$.

2. In question no.12 degree is not defined due to the term $\sin(\frac{dy}{dx})$.
3. In question no.13 degree is not defined due to the term $\sin(\frac{d^3y}{dx^3})$.
4. In question no.15 degree is not defined due to the term $\cos(\frac{dy}{dx})$.

For any clarifications or discussions, you may contact me at 9415462800 directly or through Whatsapp.