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Examination October 2020

B.Sc. F.Y (Sem-I)

2162 Mathematics MAT - 102 (Differential Equations)

Time: One Hour **Max. Marks: 25**

Solve any 25 questions

1 The condition for the differntial equation Mdx + Ndy = 0 be exact differential equation

(A) $\frac{\partial M}{\partial Y}=\frac{\partial N}{\partial X}$ (B) $\frac{\partial M}{\partial Y}=\frac{-\partial N}{\partial X}$ (C) $\frac{\partial M}{\partial X}=\frac{\partial N}{\partial Y}$ (D) $\frac{\partial M}{\partial X}=\frac{-\partial N}{\partial Y}$

2 A differential equation is an equation that involves.....

(A)Integral (B)Differentials (C)Implicit function (D)None of these

3 Ordinary differentials equations refers to

(A)Single independent variables (B)Two independent variables (C)More than two independent variables (D)None of these

4 The equation $\frac{dy}{dx}+PY=\phi$, where P and Q are functions 2 of x or constant is called as.....equations

(A)Exact (B)Homogeneous (C)Linear (D)Non- homogeneous

5 A exact differential equation is formed by 2 equating an exact differential to

(A)Function of 'x' (B)Zero (C)Function of 'y' (D)All of these

6 Solution of ordinary differential equation is.....

(A)Relation between the variable x and y (B)Relation between the variable x and constant (C)Relation between the variable x and constant (D)None of these

7 The integrating factor of the linear differential equation $\frac{dy}{dx}+Py=\phi$ is____

(A) $e^{-\int pdx}$ (B) $e^{\int \phi}de$ (C) $e^{-\int de}$ (D) $e^{\int pdx}$

8 The integrating factor of the linear differential equation $x\frac{dy}{dx}-ay=(x+1)$ is _____

(A) x^a (B) $\frac{1}{x^a}$ (C) $\frac{1}{x^4}$ (D) x^{+4}

9 The general solution of $\frac{d^n y}{dx^n}+p_1\frac{d^n-1\,y}{dx^n-1}+p_2\frac{d^n-2\,y}{dx^n}-2+.....+p_n y=x$ dis given by

(A)Y = C.F. + P.I (B)Y = C.F. (C)Y = P.I. (D)None of these

10 $\frac{1}{f(D^2)}\sin ax=----------$

(A) $\frac{1}{f(a^2)}\sin ax=----------$ (B) $\frac{1}{f(-a^2)}\sin ax=----------$ (C) $\frac{1}{f(a)}\sin ax=----------$ (D) $\frac{1}{f(-a)}\sin ax=----------$

11 The general solution of $\frac{d^2 y}{dx^2}+3\frac{dy}{dx}-54y=0$ is -____

(A) $Y=c_1e^{6x}+c_2e^{-9x}$ (B) $Y=c_1e^{-6x}+c_2e^{-9x}$ (C) $Y=c_1e^{6x}+c_2e^{9x}$ (D) $Y=c_1e^{-6x}+c_2e^{9x}$

12 The particular integral of the differential equation

$\frac{d^2 y}{dx^2}-5\frac{dy}{dx}+6y=e^{4x}$ _____ is

(A) $P.I=e^{4x}/2$ (B) $P.I._2=e^{4x}$ (C) $P.I.=e^{4x}/4$ (D) $P.I.=4e^{4x}$

13 The integral factor for the differential equation $\cos^{2x}\frac{dy}{dx}+y=\tan x\,is----------$

(A) $e^{\tan e}$ (B) $\cos x$ (C) $e^{\cos x}$ (D) $Sec^2 x$

14 The general solution of the differential equation $2\frac{d^2 y}{dx^2}+5\frac{dy}{dx}-12y=0$

(A) $Y=c_1e^{-4x}+c_2e^{3/2x}$ (B) $Y=c_1e^{-4x}+c_2e^{-3/2x}$ (C) $Y=c_1e^{4x}+c_2e^{3/2x}$ (D) $Y=c_1e^{4x}+c_2e^{-3/2x}$

15 The particular integral of the differential equation

$\frac{d^2 y}{dx^2}+2\frac{dy}{dx}+y=e^{2x}$

(A) e^{2x} (B) $e^{2x}/9$ (C) $9e^{2x}$ (D) $e^{2x}/3$

16 The general solution of the differential equation

$a^2\frac{d^y}{dx^2}-2x\frac{dy}{dx}-4y=0$

(A) $Y=c_1x^4+c_2x^{-1}$ (B) $Y=c_1x^{-4}+c_2x^{-1}$ (C) $Y=c_1x^{-4}+c_2x$ (D) $Y=c_1x^4+c_2x$

17 The partial differential equation corroponding to z = ax + by + ab is _____

(A)z = px + qy (B)z = pq (C)z = px + qy + pq (D)None of these

18 The integrating factor of the linear equation

$\frac{dy}{dx}+y=e^{-x}$ is _____

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(A) e^{x} (B) e^{-x} (C) e^{2x} (D) e^{-2x}

19 The partial differential equation can be formed by .....

(A)Eliminating arbitrary constant (B)Eliminating arbitrary function (C)Both a and b (D)None of these

20 The partial differential equation obtained from the equation z = (x + a) (y +b) is ____

(A)z = pq (B)p +q = z (C)z = p^2q^2 (D)p-q = z

21 The particular integral of the equation

$x^2\frac{d^2y}{dx^2}+7x\frac{dy}{dx}+5y=x^5$ is ____

(A) x^5 (B) $\frac{x^5}{5}$ (C) $\frac{x^5}{60}$ (D) $\frac{x^5}{25}$

22 The general solution of the differential equation $\frac{d^2y}{dx^2}-m^2y=0$ is ____

(A) $(c_1+c_2x)e^{mx}$ (B) $c_1e^{mx}-c_2e^{-mx}$ (C) $c_1e^{mx}+c_2e^{-mx}$ (D) None of these

23 The equation $\frac{dy}{dx}+PY=\phi y$, where P and Q are functions of x or constant is called as

(A)Bernoull's constant (B)Lagrange's constant (C)Linera equation (D)None of these

24 The order of equation of the differential equation is the order of.....

(A)Highest order derivative appearing in equation (B)Lower order derivative appearing in equation (C)Both a and c (D)None of these

25 $\frac{1}{f}(D)e^{ax}V_1$ =____

(A) $e^{ax}\frac{1}{f(D+a)}v_1$ (B) $e^{ax}\frac{1}{f(D-a)}v_1$ (C) $\frac{1}{f(D+a)}v_1$ (D) $e^{ax}\frac{1}{f(a)}v_1$

26 The partial differential equation obtained from the equation $I=e^{xy}\Theta(x-y)$ is

(A) $p+q=mz$ (B) $P-q=mz$ (C) $pq=mz$ (D) $p^2+q^2=mz$

27 The general solution of the differntial equation $\frac{d^2y}{dx^2}=x.e^{x}$ is____

(A) $y=xe^{x}-2e^{x}+4x+c_2$ (B) $y=xe^{x}+4x+c_2$ (C) $y=xe^{x}+4x^2+c_2$ (D) $y=xe^{x}+3e^{x}+4x+c_2$

28 The partial integral of the differential equation $f(d)y=x$ is found by the formula

(A) $P.I.=\frac{1}{f}(D)x$ (B) $P.I.=\frac{1}{f}(D)y$ (C) $P.I.=\frac{1}{D^2}x$ (D) None of these

29 The integrating factor of linear equation $(x+1)\frac{dy}{dx}-ny=e^{x}(x+1)^{n+1}$

(A) $(x+1)^{n}$ (B) $(x+1)^{-n}$ (C) $(x+1)$ (D) $(x+1)^2$

30 $\frac{1}{f(\Theta)}x^{m}$

(A) $\frac{1}{m}x^{m}$ (B) $\frac{1}{f(m)}x^{m}$ (C) $\frac{1}{f(-m)}x^{m}$ (D) $\frac{1}{f(m^2)}x^{m}$