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Total No. of Pages : 02

Total No. of Questions : 18

B.Sc. (Non Medical) (2018 Batch) (Sem.-3)

DIFFERENTIAL EQUATIONS

Subject Code : BSNM-306-18

M.Code : 76905

Time : 3 Hrs.

Max. Marks : 50

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Write briefly :

1. Show that $\frac{1}{x^2}$ is integrating factor of $y dx - x dy = 0$.
2. What is Geometrical meaning of Differential equation?
3. Define Legendre's linear equation.
4. Define linear differential equation with constant coefficients.
5. Define linear & Non-Linear Partial Differential equation.
6. Form Partial Differential equation by eliminating arbitrary constants from the relation

$$Z = axe^y + \frac{1}{2}a^2e^{2y} + b.$$

7. Find general solution of $3r + 10s + 3t = 0$.
8. Define complementary function & particular integral.
9. Find general solution of $(D^2D' - 3DD'^2 + 2D'^3)z = 0$.
10. Solve $y = px + ap(1 - p)$.

SECTION-B

11. Solve $(x^2 + y^2 + 2x) dx + 2y dy = 0$.
12. Solve the equation $y'' + 2y' + y = (e^x - 1)^{-2}$ by the method of reduction of order.
13. Find the equation of integral surfaces of $xp + yq = z$, which passes through $y + x = 1$, $yz = 1$.
14. Solve by Charpit's method $q = 3p^2$.
15. Solve $x + \frac{p}{\sqrt{1+p^2}} = a$.

SECTION-C

16. a) Find the orthogonal trajectories of all parabolas with vertices at the origin & foci on the y -axis.
b) Solve $(D^2 + 1)y = \tan x$ by method of variation of parameters.
17. a) Find the equation of surfaces orthogonal to $F\left(\frac{x}{z}, \frac{y}{z}\right) = 0$
b) Find the general solution of $(r - 2s + t) = e^{x+2y} + x^3$.
18. a) Solve $(D^4 + 3D^3 + 3D^2 + D)y = e^{-x}$.
b) Solve the system of equations $\frac{dy}{dx} + y = z + e^x$, $\frac{dz}{dx} + z = y + e^x$.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.