

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE)/(EE)/(ME)/(Civil Engg.) (2018 & Onwards) (Sem.-2)

MATHEMATICS-II

Subject Code : BTAM-201-18

M.Code : 76254

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A**Answer briefly :**

- 1) Is the differential equation $e^x (\cos y dx - \sin y dy) = 0$ exact?
- 2) Write the Laplace equation in cylindrical coordinates.
- 3) Write the 1-D diffusion equation.
- 4) Write the Euler's equation.
- 5) Convert the equation $ax^2 + by^2 = 1$ into differential equation.
- 6) Find the integrating factor, which makes the equation $(5x^3 + 12x^2 + 6y^2) dx + 6xydy = 0$ exact.
- 7) Find the solution of the differential equation $y''' - 3y' - 2y = 0$
- 8) Is $xv_x + yv_y = v^2$ a non-linear PDE?
- 9) Check if the PDE $2r - s - t - p + q = 0$, is parabolic, elliptic or hyperbolic?
- 10) Define linear ODE.

SECTION-B

- 11) Find the power series solution about $x = 0$, of the differential equation $y'' - 4y = 0$.
- 12) Solve the differential equation $y' + 4xy + xy^3 = 0$.
- 13) Solve by method of variation of parameters $y'' - 2y' + y = e^x \tan x$.
- 14) Solve $(D^2 + DD' - 6D'^2) z = y \sin x$.

SECTION-C

- 15) Find the general solution of the Lagrange's equation $2yzp + xq = 3xy$.
- 16) a) Find the complete integral of the PDE $p(3 + q) = 2qz$.
- b) Find the general solution of the PDE $(2D^2 - DD' - D'^2 + D - D') z = e^{2x+3y}$
- 17) a) Derive D'Alembert's solution of 1-D wave equation.
- b) Solve $y^2 p^2 - 3xp + y = 0$.
- 18) a) Solve $\frac{d^2 y}{dx^2} - 5\frac{dy}{dx} + 6y = e^{4x}$.
- b) Solve $2y \frac{dy}{dx} = x^2 + \sin 3x$

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.