MANAV RACHNA
vidyanatariksham

MANAV RACHNA UNIVERSITY
(FORMERLY MANAV RACHNA COLLEGE OF ENGINEERING
NAAC ACCREDITED 'A' GRADE INSTITUTION)
Declared as State Private University under section 2f of the UGC act, 1956

DEPARTMENT OF MATHEMATICS

"T3, Examination, MAY-2018"

Semester: IV	Date of Exam: 15/05/2018
Subject: Differential Equ. &MM-II	Subject Code: MAH228-T
Branch: Mathematics	Session: II
Course Type: Core	Course Nature: Hard
Time: 3 Hours	Program: B.Sc
Max.Marks: 80	Signature: HOD/Associate HOD: Amit Awasthi

Note: All questions are compulsory from Part-A (2 X 10=20 Marks). Attempt any two questions from Part-B and Part-C (15 Marks each).

PART-A

1 (a). Define linear partial differential equation with example.

(b). Solve $\frac{\partial^2 z}{\partial x^2} - a^2 \frac{\partial^2 z}{\partial y^2} = 0$

(c). Find Particular Integral of $\left(D^3 - 6D^2\,D' + 11\,D\,D'^2 - 6\,D'^3\right)z = e^{5x+6y}$

(d). Define non homogeneous linear partial differential equation with example.

(e). Solve $(D^2 - D'^2 + D - D')\,z = 0$

(f). Find P.I of $(D - D' - 1)\,(D - D' - 2)\,z = \sin\,(2x + 3y)$

(g). Define PDE of order Two with variable coefficients.

(i). write down the classification of PDE of second order.

(j). Classify the following PDEs

(i). 2 r + 4s +3 t -2 = 0 (ii). r + 4s +4 t = 0

PART-B

2 (a). Solve the PDE $(D^4 + D'^4)\,z = 0$

(b). Solve $\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial y^2} = \cos mx \cos ny$

3 (a). Solve r + s – 6t = y cos x

(b). Solve $(D^2 - D'^2 + D - D')\,z = e^{2x+3y}$

4 (a). Solve $D^2 - D')\,z = 2y - x^2$

(b). Solve $(3D^2 - 2D'^2 + D - 1)\,z = 4\,e^{x+y}.\cos(x + y)$

PART-C

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5(a). Solve $y\,s + p = \cos(x+y) - y\sin(x+y)$

(b). Solve $t - x\,q = x^2$

6 (a). Solve $x\,r + y\,s + p = 10x\,y^3$

(b). Find the characteristic equation of $y^2\, r - x^2\, t = 0$

7(a). Reduce $x^2 \dfrac{\partial^2 z}{\partial x^2} - y^2 \dfrac{\partial^2 z}{\partial y^2} = 0$ to canonical form.

(b). Reduce $\dfrac{\partial^2 z}{\partial x^2} - +2\dfrac{\partial^2 z}{\partial y \partial x} + \dfrac{\partial^2 z}{\partial y^2} = 0$ to canonical form.