



UTTARAKHAND OPEN UNIVERSITY, HALDWANI
(NAINITAL)

उत्तराखण्ड मुक्त विश्वविद्यालय, हल्द्वानी(नैनीताल)

M.A./ M.Sc. Mathematics
ASSIGNMENT- FIRST YEAR

<i>Last Date of Submission:</i> 15 May	जमा करने की अन्तिम तिथि:	15 मई
CosourseTitle: Differential equations, Calculas of variatious and special functions	Course code:	MAT 503
Year: 2012-13	Maximum Marks :	40

Section 'A'
भाग क

Section 'A' contains 08 short answer type questions of 5 marks each. Learners are required to answers 4 questions only. Answers of short answer-type questions must be restricted to 250 words approximately.

Briefly discuss the following:

1. Solve:

$$Y_1 = 2x - (x^2 + 1) y + y^2$$

Where $(X^2 + 1)$ is an integral.

2. Solve:

$$(Yz + 2x) dx + (zx - 2z) dy + (xz - 2y) dz = 0$$

3. Solve the equation:

$$\nabla^2 \psi - 1/c^2 \partial \psi / \partial t^2 = 0$$

4. Show that:

$$J_{1/2}(x) = \sqrt{2/\pi x} \sin x$$

5. Show that:

$$H_n(x) = (-1)^n e^{x^2} d^n e^{-x^2} / dx^n$$

6. Obtain the solution of the two dimensional diffusion equation

$$\delta^2 \theta / \delta x^2 + \delta^2 \theta / \delta y^2 = 1/k \quad \partial \theta / \partial t$$

7. Solve: $xr + p = 9x^2y^3$

8. Find the extremal of the function

$$\int x^3/y^{12} dx \text{ with } y(1) = 0 \text{ and } y(2) = 3$$

Section 'B'
भाग ख

Section 'B' contains 04 long answer-type questions of 10 marks each. Learners are required to answers 02 questions only.

1. Solve the equation in series

$$2x^2y'' - xy' + (1-x^2)y = x^2$$

2. Solve:

$$y^2r-2ys + t = p+6y$$

By using Monge's method.

3. Prove:

$$\int_{-1}^1 x P_n(x) P_{n-1}(x) dx = 2n/4n^2-1$$

4. Find the eigen values and the corresponding eigen functions of the boundary value problem

$$Y''+2y'+ (1+\lambda)y =0, \quad y(0) = 0, \quad y'(a)=0$$