RUILINU.						

Total No. of Pages : 02

Total No. of Questions : 11

## M.Sc. (Mathematics) (2018 Batch) (Sem.–1) ORDINARY DIFFERENTIAL EQUATIONS AND SPECIAL FUNCTIONS Subject Code : MSM-104-18 M.Code : 75132

Time : 3 Hrs.

## Max. Marks : 70

### INSTRUCTIONS TO CANDIDATES :

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

# SECTION-A

- 1. State Piano's theorem.
- 2. State Expansion theorem.
- 3. What is Hermit polynomial?
- 4. Write Rodrigue's formula.
- 5. Solve  $\frac{dy}{dx}$  2xy ex

## SECTION-B

- 6. Derive Abel-Liouville Formula.
- 7. State and prove Fundamental existence and uniqueness theorem.
- 8. Find nontrivial Solution of the Sturm-Liouville problem



#### SECTION-C

9. Find the power series solution of the differential equation in power of x .

$$\Box_{\mathbf{x}} \Box_{\mathbf{x}} \Box$$

10. Define Bessel equation of order p, and obtain its solution.

11. Prove that, 
$$L_n \supseteq x \square n! \prod_{m \square 0}^{\square} \frac{2^n \square m}{m! \square n} \prod_{m \square} n \square m$$

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