Roll No.

Total No. of Pages: 02

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M.Sc. (Mathematics) (Sem. – 4) DIFFERENTIAL GEOMETRY

Subject Code: MSM401-18

M Code: 77870

Date of Examination: 13-12-2022

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 contains THREE questions carrying FIFTEEN marks each and students have to attempt any TWO questions.
- 3. SECTION-C contains THREE questions carrying FIFTEEN marks each and students have to attempt any TWO questions.

SECTON-A

- 1. Write briefly:
 - a) Define Principal normal.
 - b) Define Envelopes.
 - c) Define Developable surfaces.
 - d) Define Conjugate direction.
 - e) State Clairaut's theorem.

SECTION-B

- 2. State and prove Serret-Frenet Formulae.
- 3. a) Prove that each characteristics touches the edge of regression.
 - b) Find the envelope of a plane that forms with the rectangular coordinate planes a tetrahedron of constant volume $c^2/6$.

4. Derive the necessary and sufficient condition for the surface to be a developable surface. Hence show that the surface $xy = (z - c)^2$ is developable.

SECTION-C

- 5. State and prove Mainardi-Codazzi Equations.
- 6. State and Prove Gauss Bonnet theorem.
- 7. State and prove Tissot's theorem.

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.