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MT-607

Viscous Fluid Dynamics-II

MA/MSC Mathematics (MAMT/MSCMT)

4th Semester Examination, 2022 (Dec.)

Time : 2 Hours] **[Max. Marks : 35**

Note : This paper is of Thirty Five (35) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

SECTION–A

(Long Answer Type Questions)

Note : Section 'A' contains Five (05) long answer type questions of Nine and Half (9½) marks each. Learners are required to answer any Two (02) questions only. (2×9½=19)

1. Discuss the starting flow in plane couette motion.

2. Discuss the temperature distribution of plane Couette flow with transpiration.

3. Discuss Stokes' flow past a sphere.

4. Discuss the temperature distribution in plane poisevilte flow.

5. Derive the boundary layer equations in two dimensional flow.

SECTION–B

(Short Answer Type Questions)

Note : Section 'B' contains Eight (08) short answer type questions of Four (04) marks each. Learners are required to answer any Four (04) questions only. (4×4=16)

1. Write Stokes equations for very slow motion. Also show that for very slow motion the pressure p is a harmonic equation.

2. Solve the Stokes equations for uniform flow past a circular cylinder of radius a.

3. Describe parameters, which are characteristics of a boundary layer.

4. Discuss Oseen's improvements to Stokes theory.

5. Write a short note on "Crocco's first integral".

6. Discuss Prandtl's theory of boundary layer.

7. Derive two dimensional boundary layer equation for the viscous incompressibel fluid flow past a thin plate.

8. Discuss the boundary layer flow once a flat plate.
