Roll No. .....

24172

B. Tech. 4th Semester (ME) Examination – May, 2017

FLUID MECHANICS

Paper : ME-208-F

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 is ***compulsory***. Students have to attempt ***five*** questions in total, at least ***one*** questions from each Section.

1. (a) What is the Pascal's Law ? 5

(b) What is the isentropic flow ? 5

(c) Define the minor losses in pipes ? 5

(d) What is prandtl mixing length hypothesis ? 5

SECTION – A

2. An open tank 30m long and 2m deep is fieled with 1.5m of oil of specific gravity 0.82. The tank is accelerated uniformly from rest to a speed of 20 m/s. What is the shortest time in which this speed may be attained without spilling any oil ? 20

3. (a) Discuss the eulerian and Lagrangian description of fluid flow ? 10

(b) Discuss the Newtonian and Non-Newtonian fluid. 10

SECTION – B

4. Work out the velocity of efflux from the nozzle located in the wall on an open reservoir. Water flows from a large tank open to atmosphere, through a 10 cm diameter wall rounded aperture in its's sides. The free surface of water is 5 m above the centre line of the aperture. Calculate the velocity of jet issuing from the hole and the discharge. If a 90° elbow is placed at exit from the aperture. Find out how high the water will reach. 20

5. (a) Discuss the Bernoulli's equation. 10

(b) Explain the continuity momentum and energy equation in detail. 10

SECTION – C

6. (a) What is the relationship between the shear stress and pressure gradient ? 10

(b) Discuss the hydraulic gradient and total energy lines. 10

7. (a) Write notes on flow regimes and Reynold's number. 10

(b) Discuss the series and parallel connection of pipes. 10

SECTION – D

8. (a) Discuss the velocity distribution in pipes. 10

(b) What is laminar and turbulent boundary layer flows ? 10

9. Write short notes on the following : 20

(a) Boundary layer concept

(b) Shear stress in turbulent flow
