

9. Write short notes on the following :

20

- (a) Boundary layer concept
  - (b) Shear stress in turbulent flow
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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 filled 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 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

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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

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