

Roll No.

24196

**B. Tech. 4th Semester (Civil)
Examination – May, 2023**

FLUID MECHANICS-II

Paper : CE-204-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. Attempt total five questions, selecting one question from each Unit. All questions carry equal marks.

1. Write short notes on : $4 \times 5 = 20$
- (a) Gradient line.
 - (b) Water Hammer
 - (c) Characteristic curves of Turbine.
 - (d) Manometric Head
 - (e) Surges.

UNIT - I

2. What do you mean by Prandtl's mixing Length Theory ? Find an expression for shear stress due to Prandtl length theory. 20
3. Determine the wall shearing stress in a pipe of diameter 100 mm which carries water. The velocities at the pipe center and 30 mm from the pipe center are 2 m/s and 1.5 m/s respectively. The flow in pipe is given as turbulent. 20

UNIT - II

4. A trapezoidal channel has side slopes of 3 horizontal to 4 vertical and slope of its bed is 1 in 2000. Determine the optimum dimensions of the channel, if it to carry water at 0.5 m/s. Take Chezy's constant as 80. 20
5. (a) Derive the condition for the best slope of the most economical trapezoidal channel. 10
(b) Derive an expression for the discharge through a channel by Chezy's formula. 10

UNIT - III

6. Describe briefly the function of various main components Pelton turbine with neat sketches. 20
7. (a) How are the drag and lift forces caused on a body immersed in a moving fluid ? 10
(b) Differentiate between Friction Drag and Pressure Drag. 10

24196- (P-3)(Q-9)(23) (2)

UNIT - IV

8. A centrifugal pump is to discharge $0.118 \text{ m}^3/\text{s}$ at a speed of 1450 rpm against a head of 25 m. The impeller diameter is 250 mm, its width at outlet is 50 mm and manometric efficiency is 75%. Determine the vane angle at the outer periphery of the impeller. 20
9. What is a reciprocating pump ? Describe the principle and working of a reciprocating pump with a neat sketch. Why is a reciprocating pump not coupled directly to the motor ? 20

24196- (P-3)(Q-9)(23) (3)