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.

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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 m³s. 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

UNIT – IV

8. A centrifugal pump is to discharge 0.118 m³/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

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