

Dec.-22-0178

CE-504 (Mechanics of Fluids-II)

B.Tech. 5th (CBCS)

Time : 3 Hours

Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt Five Questions in all at least one question from each unit. All questions in unit I to IV carry equal marks. Question no. 9 will be compulsory and of 20 marks.

UNIT - I

1. Derive expressions for the velocity and shear stress distributions for laminar flow between two parallel fixed plates. (10)
2. What is meant by boundary layer? How will you decide whether a boundary layer flow is attached flow, detached flow or on the verge of separation? (10)

UNIT - II

3. Show that the hydraulic mean depth of a rectangular channel having the best proportion is half of the minimum depth. (10)
4. Derive an expression for conditions of maximum discharge for a given value of specific energy. (10)

UNIT - III

5. Define hydraulic jump. Derive expressions for depth of hydraulic jump. (10)
6. What do you mean by non uniform flow? Explain the classification of slopes. (10)

UNIT - IV

7. What is governing of turbines? Explain the governing mechanisms of Kaplan hydraulic turbines. Clearly state how it differs from the governing mechanism of a Francis turbine. (10)
8. What is reciprocating pump? Define slip, coefficient of discharge and negative slip of reciprocating pumps. (10)
9. (a) Explain the Reynolds experiment with a neat sketch.
(b) Describe Manning's formula.
(c) Derive an expression for draft tube.
(d) Derive expressions for critical velocity and critical depth in non-uniform flow. (4×5=20)

