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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (CE) (2012 to 2017) (Sem.-4)

FLUID MECHANICS-II

Subject Code : BTCE-404

M.Code : 56086

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A**Answer briefly :**

- Q1 Name the four methods to control the separation of boundary layer.
- Q2 What are the differences between hydraulic jump and a surge?
- Q3 What are the forces accounted for the Navier-Stokes equation?
- Q4 Write any two factors on which the Manning's roughness depends with reasons.
- Q5 Discuss open channel flow.
- Q6 Define the term Alternate Depth.
- Q7 Estimate the longitudinal slope of the channel with depth 2.0 m having the permissible shear stress of 1.96 N/m^2 .
- Q8 State Kutter's formula for determining the constant C.
- Q9 Define Critical Velocity.
- Q10 Discuss closed conduit flow.

SECTION-B

- Q11 Discuss with reasons, the changes in the water surface profiles in a channel over a local rise in the channel bed with the help of a specific energy curve.
- Q12 A river 90 m wide and 3 m deep has a stable bed and vertical banks with a surface slope of 1 in 2500. Estimate the length of backwater curve produced by an afflux of 2 m. Assume Manning's $n = 0.035$.
- Q13 Compare the cost of pumping the same fluid at same discharge through pipes having 15 cm and 20 cm diameters. The absolute roughness of the pipe is 0.03 cm. Assume that the Reynold's number is sufficiently high, so that the viscous effect is negligible.
- Q14 Derive an expression for the loss of head due to friction in pipes.
- Q15 Differentiate between Laminar flow and Turbulent flow. Give examples of these flows.

SECTION-C

- Q16 What is Specific Energy? Draw and discuss the specific energy curve. Hence derive the condition for critical flow in a channel.
- Q17 In a rectangular channel, the specific discharge is $1.62 \text{ m}^3/\text{s}/\text{m}$ and the loss of energy in the jump is 2.2 m. Determine the two sequent depths.
- Q18 What conditions are necessary for formation of hydraulic jump? What are the elements and characteristics of hydraulic jump?

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.