

BACHELOR OF TECHNOLOGY (C.B.C.S.) (2020 COURSE)
B.Tech.Sem - IV CIVIL : WINTER- 2022
SUBJECT : OPEN CHANNEL FLOW & HYDRAULIC MACHINERY

Day : Friday

Time : 02:30 PM-05:30 PM

Date : 25-11-2022

W-24372-2022

Max. Marks : 60

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat labelled diagrams **WHEREVER** necessary.

- Q.1**
- a) What is velocity distribution in open channel? (05)
 - b) A flow of water 40 liters/ second flows down a rectangular flume of width 300mm. If Chezy's constant $C = 60$ find bottom slope necessary for uniform flow with a depth of 200mm. (05)

OR

- Q.1**
- a) What is specific energy? (05)
 - b) Find the discharge through trapezoidal channel width 6m and side slope of 1H:3V. The depth of flow of water is 2m and value of Chezy's constant is 50. The bed slop of channel is 1 in 3000. (05)

- Q.2**
- a) What is gradually varied flow? Give examples. (05)
 - b) Derive the equation for gradually varied flow. (05)

OR

- Q.2**
- a) What are basic assumptions in derivation of GVF? (05)
 - b) Draw a neat sketch and explain profiles on Mild Slope. (05)

- Q.3**
- a) Write the classification of Hydraulic jump based on Froude Number. (05)
 - b) In a rectangular channel a discharge of $2\text{m}^3/\text{s}$ per meter width takes place with Froude number 5. If hydraulic jump formation takes place calculate the energy lost per meter width of channel due to jump. (05)

OR

- Q.3**
- a) Explain the procedure for location of Hydraulic jump. (05)
 - b) A energy dissipater is designed to have an energy loss of 8m when the Froude number upstream of the jump is 7. Find the sequent depths of the flow. (05)

- Q.4**
- a) What is unsteady flow? Give three examples. (05)
 - b) Derive expression for Celerity of Wave? (05)

OR

- Q.4**
- a) What is surge tank? What are their functions? (05)
 - b) What is drag and lift? (05)

- Q.5**
- a) What are elements of hydropower plant? (05)
 - b) A jet of water 7cm in diameter strikes a smooth curved plate at center with velocity of 15m/s. The curved plate is moving in the direction of jet with velocity of 3m/s. The jet is deflected through an angle of 165° after striking the plate. Find force exerted by the jet on the plate. (05)

OR

- Q.5**
- a) What are cavitations in Turbine? (05)
 - b) What is governing of turbines? (05)

- Q.6**
- a) What is static head and manometric head of centrifugal pump? (05)
 - b) What is priming? Why it is necessary? (05)

OR

- Q.6**
- a) Explain the working of Centrifugal pump. (05)
 - b) What are characteristics in case of centrifugal pump? (05)