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

Day : Thursday
Date : 16-06-2022

S-24372-2022

Time : 10:00 AM-01:00 PM
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 natural channel? **(05)**

b) A flow of water 60 liters/ second flows down a rectangular flume of width 400 mm. If Chezy's constant C = 60 find bottom slope necessary for uniform flow with a depth of 250 mm. **(05)**

OR

Q.1 **a)** What is specific force? **(05)**

b) Find the discharge through trapezoidal channel of width 8 m and side slope of 1H: 3V. The depth of flow of water is 4.5 m and value of Chezy's constant is 50. The bed slope of channel is 1 in 3500. **(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 the differences between Standard Step Method and Direct Step Method? **(05)**

b) Draw a neat sketch and explain profiles of Steep Slope. **(05)**

Q.3 **a)** What are the assumptions in the theory of hydraulic jump? **(05)**

b) A hydraulic jump occurs in a rectangular channel and depths of flow before and after the jump are 0.5 m and 2.5 m respectively. Calculate energy loss in the jump and critical depth of flow. **(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 8.5 m when the Froude number upstream of the jump is 7. Find the sequent depths of the flow. **(05)**

Q.4 **a)** What is water hammer phenomenon? **(05)**

b) What is drag and lift? **(05)**

OR

Q.4 **a)** What is surge tank? What are their functions? **(05)**

b) What are types of drag? **(05)**

Q.5 **a)** What is gross head and net (effective) head in case of turbine? **(05)**

b) What is governing of turbines? **(05)**

OR

Q.5 **a)** What are elements of hydropower plant? **(05)**

b) A jet of water 8 cm in diameter strikes a smooth curved plate at center with velocity of 15 m/s. The curved plate is moving in the direction of jet with velocity of 3.5 m/s. The jet is deflected through an angle of 165^0 after striking the plate. Find force exerted by the jet on the plate. **(05)**

Q.6 **a)** Explain the working of Centrifugal Pump? **(05)**

b) What is N. P. S. H. in case of centrifugal pump? **(05)**

OR

Q.6 **a)** What is static head and manometric head of centrifugal pump? **(05)**

b) What is priming? Why it is necessary? **(05)**

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