

Model Question Paper  
SIXTH SEMESTER B.TECH CIVIL ENGINEERING  
**CE 010 606 L02 Open Channel Flow and Coastal Hydraulics (Elective I)**

Time 3 hrs

Max marks 100

**Part A (Answer ALL Questions)**

1. Differentiate between normal depth and critical depth in open channel flow
2. What do you mean by mild slope and critical slope in open channel flow
3. What are the different types of hydraulic jump
4. Explain the term celerity of wave
5. Differentiate between periodic oscillatory and periodic progressive waves

(3X5)

**Part B (Answer ALL Questions)**

6. What is section factor? What are the various characteristics of critical state of flow
7. What are the assumptions used for deriving the Dynamic Equation of Gradually Varied Flow
8. Discuss the practical applications of hydraulic jump
9. What is wave breaking? Explain
10. Give brief description about beach nourishment

(5X5)

**Part C (Answer ALL Questions)**

11. From the basics, derive the Manning's Equation for velocity in an open channel flow

OR

12. A flow of 100 l/s flows down in a rectangular channel of width 0.6m and having adjustable bottom slope. If Chezy's C is 56 determine the bottom slope necessary for uniform flow with a depth of flow 0.3m. Also find the conveyance and the state of flow.
13. Derive the Dynamic equation for Gradually Varied Flow in wide rectangular channel of width B.

Or

14. A rectangular flume 2m wide carries discharge at the rate of 2 cumecs. The bed slope of the flume is 0.0004. At certain section the depth of flow is 1m. Calculate the distance of the section downstream where the depth of flow is 0.9m. Solve by single step method.

Assume rugosity coefficient as 0.014. Is the slope of the channel mild or steep? How is this type of surface profile classified?

15. Derive the equation for the loss of energy  $\Delta E = \frac{(y_2 - y_1)^3}{4y_2y_1}$  in hydraulic jump.

Or

16. A horizontal rectangular channel 4m wide carries a discharge of 16cumecs. Determine whether a jump may occur at an initial depth of 0.5m or not. If a jump occurs, determine the sequent depth to this initial depth. Also determine the energy loss in the jump.

17. What are the modes of wave transformation? Explain

Or

18. Explain small amplitude wave theory

19. What is wave forecasting? Explain SMB method

Or

20. What is breakwater? How is it classified? Explain one in detail

(12X5)