

ANNA UNIVERSITY OF TECHNOLOGY, COIMBATORE
B.E. / B.TECH. DEGREE EXAMINATIONS : NOV / DEC 2011
REGULATIONS : 2008
FOURTH SEMESTER : CIVIL ENGG.
080100020 - APPLIED HYDRAULIC ENGINEERING

Time : 3 Hours

Max.Marks : 100

PART - A

(10 x 2 = 20 MARKS)

ANSWER ALL QUESTIONS

1. Write the types of regimes of flow.
2. What is specific energy?
3. Define uniform flow and laminar flow.
4. Write the Chezys equation
5. If the depth increases in the direction of flow, what type of curve is formed?
6. What is horizontal slope?
7. Define negative slip
8. What is cavitation?
9. Differentiate pump and turbine.
10. Give example for reaction turbine.

PART - B

(5 x 16 = 80 MARKS)

ANSWER ALL QUESTIONS

- 11 a) Derive the equations for i) Critical depth ii) Critical velocity and iii) Minimum specific energy in terms of critical depth.

OR

- b) Find the slope of the bed of a rectangular channel of width 5m when the depth of water is 2m and the rate of flow is given as $20\text{m}^3/\text{s}$. Assume $C = 50$

- 12 a) Calculate the normal depth of flow for a trapezoidal channel having side slopes of 2H to 1V and bottom width 5 meter, discharging $8\text{m}^3/\text{s}$. Take $n = 0.025$ and slope as $1/750$

OR

- 12 b) A trapezoidal channel is to carry $142\text{m}^3/\text{minute}$ of water is designed to have minimum cross section. Find, bottom width and depth, if the bed slope is 1 in 1200, the side slopes are 45° and Chezys coefficient is 55.

- 13 a) Derive the Dynamic equation of Gradually varied flow.

OR

- 13 b) The depth of flow of water at a certain section of a rectangular channel of 2m wide is 0.3m. The discharge through the channel is $1.5\text{m}^3/\text{s}$. determine whether the hydraulic jump will occur or not, if so find its height, loss of energy per kg of water and power lost.

- 14 a) Draw a neat sketch of a Reciprocating pump and name the components, and explain the working procedure.

OR

- 14 b) i) A centrifugal pump is to discharge $0.118\text{m}^3/\text{s}$ at a speed of 1450 rpm, against a head of 25m. The impeller diameter is 250mm, its width at outlet is 50mm and manometric efficiency is 75%. Determine the vane angle at the outer periphery of the impeller. (10)

- ii) Explain coefficient of discharge, slip and percentage of slip and negative slip in reciprocating pump. (6)

