Q.P. Code: **16CE113**

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Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY::PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations December 2018
HYDRAULICS & HYDRAULIC MACHINERY
(Civil Engineering)

Time: **3 hours**   Max. Marks: **60**
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(Answer all Five Units **5 X 12 = 60** Marks)

UNIT-I

1 a. Define open channel flow and differentiate pipe flow and open channel flow.   **6M**
  b. A circular conduit flowing half full carries $500 m^3$/sec of velocity 10m/sec. If n=0.13 will the flow be subcritical (or) super-critical.   **6M**

OR

2 a. Write short notes on the following uniform & non-uniform flow. Most economical section of the channel.   **6M**
  b. A trapezoidal channel has a bottom width of 6.0M and slopes of 1:1. The depth of flow is 1.5M at a discharge of $15 m^3$/sec. Determine the specific energy and alternate depths.   **6M**

UNIT-II

3 a. Define gradually varied flow in open channels. Write down the assumptions made in GVF equations?   **6M**
  b. Name and sketch various flow profile.   **6M**

OR

4 a. Classify the hydraulic jump on the basis of frauds number.   **6M**
  b. A hydraulic jump occurs in a 4M wide rectangular channel carrying $5 M^3$/sec on a slope of 0.004, the depth after the jump is 1.2M. Find (i) depth before jump, (ii) losses of energy.   **6M**

UNIT-III

5 a. Derive an expression for the force, work done and efficiency of a moving curved vane.   **6M**
  b. A jet of 12cm diameter strikes at the centre of a smooth semispherical vane. Assume velocity of the jet and vane as 20M/sec, and 8M/sec respectively. What will be the thrust on a wheel fitted with a series of such vanes?   **6M**

OR

6 A jet of water having a velocity of 30M/sec impinges on a series of vanes with a velocity of 15M/sec. The jet makes an angle of 30° to the direction of vanes when entering and leaves at an angle of 120°. Sketch the velocity triangles at the entrance and the exist and determine the following?
  (i) The angle of the vane tips so that the water enters and leaves without shocks.
  (ii) The work done per unit wt or water entering the vanes.
  (iii)The efficiency.   **12M**

UNIT-IV

7 a. Write a brief note on the classification of hydraulic turbine.   **6M**
  b. A Pelton wheel working under a head of 400M produces 12,000 kW at 400rpm.
    If the efficiency of the wheel is 80% determine (i) Discharge of the turbine
    (ii) Diameter of the wheel, (iii) Diameter of the nozzle (assume suitable data).   **6M**

OR

8 a. Obtain an expression for unit speed, unit discharge and unit power for a turbine.   **6M**
  b. Write a short note on draft turbine.   **6M**

UNIT-V

9 a. Name the various types of pumps used in civil sub practice indicating their names. **6M**

b. Derive an expression for the head developed in the impeller of a rotodynamic pump. **6M**

OR

10 a. How will you classify the reciprocating pumps? **6M**

b. A single acting reciprocating pump has the plunder diameter of 200mm and stroke of 300mm. the pump discharges $0.6M^3$ of water per minute of 65 rpm. Find the theoretical discharge coefficient of discharge and percentage slip of the pump respective if suction and delivery heads are 6M and 18M. Find the work out power required to run the pump. **6M**

END