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***B.Tech. Degree IV Semester Special Supplementary Examination
September 2014***

**CE 1405 (A/B) FLUID MECHANICS - II
(2012 Scheme)**

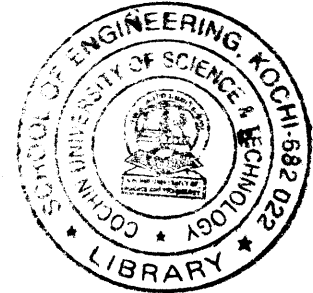
Time : 3 Hours

Maximum Marks : 100

PART A(Answer *ALL* questions)

(8 x 5 = 40)

- I. (a) Distinguish between uniform flow and non uniform flow.
- (b) Differentiate between specific energy and specific force.
- (c) Classify channel bottom slopes
- (d) Write short note on hydraulic jump.
- (e) Discuss draft tube theory.
- (f) Explain the different types of efficiencies of turbine.
- (g) Define slip and negative slip in reciprocating pumps
- (h) Why is priming necessary in centrifugal pumps?

**PART B**

(4 x 15 = 60)

- II. For a constant specific energy of 1.8N.m/N, calculate the maximum discharge that may occur in a rectangular channel 5.0m wide. (15)
- OR**
- III. (a) Derive an expression for the most economical rectangular channel section. (10)
- (b) Distinguish between laminar flow and turbulent flow. (5)
- IV. In a rectangular channel there occurs a jump corresponding to $Fr_1=2.5$. Determine the critical depth and head loss in terms of initial depth y_1 . (15)
- OR**
- V. (a) Distinguish between backwater curve and draw down curve. (5)
- (b) The depth and velocity of flow in a rectangular channel are 0.8m and 1.4m/s respectively. If a gate at the downstream end of channel is abruptly closed, what will be the height and absolute velocity of the resulting surge? If the channel is 700m long, how much time will be required for the surge to reach the upstream end of the channel? (10)
- VI. Derive an expression for the force exerted by a fluid jet on moving curved vane, if the jet striking symmetrical, moving curved vane at the centre. (15)
- OR**
- VII. A jet of water 70mm in diameter having velocity of 20m/s strikes a series of the flat plates arranged around the periphery of a wheel such that each plate appears successively before the jet. If the plates are moving at a velocity of 5m/s, compute the force exerted by the jet on the plate, the work done per second on the plate and the efficiency of the jet. (15)
- VIII. Explain the working of centrifugal pump with neat sketch. (15)
- OR**
- IX. A single acting reciprocating pump has a plunger of diameter 200mm and stroke of 300mm. If the speed of the pump is 60 r.p.m. and it delivers 15.5 litres per second of water against a suction head of 5m and a delivery head of 20m, find the theoretical discharge, coefficient of discharge, the slip, the percentage slip of the pump and power required to drive the pump. (15)