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Reg. No. : .....

Name : .....

Fourth Semester B.Tech. Degree Examination, June 2017
(2008 Scheme)
08.404 : FLUID MECHANICS – II (C)

Time : 3 Hours Max. Marks : 100

PART – A

I. Answer **all** questions :

a) With a figure, explain the concept of specific energy.

b) What are the various types of flow in a channel ? Explain briefly.

c) What is meant by non-uniform flow ? State the assumptions in the derivation of gradually varied flow.

d) Write a short note on hydraulic jump. Explain different types.

e) What is meant by dimensional homogeneity ? Explain with an example.

f) Differentiate distorted and undistorted model. Explain briefly scale effect.

g) Compare the velocity triangles for impulse turbine and reaction turbine.

h) Explain the term slip and percentage slip with respect to pump. **(8×5=40 Marks)**

PART – B

Answer **any one full** question from **each** Module.

Module – I

II. a) What is meant by economic section ? Derive the expression for the most economic section of trapezoidal channel. **10**

b) Define critical flow. Derive the condition of critical flow for a rectangular channel. A trapezoidal channel has a bottom width of 6 m and side slope of 2 horizontal to 1 vertical. If the depth of flow is 1.2 m at a discharge of 10 m^3/s, compute the specific energy and critical depth ? **10**

OR

III. a) Derive the expression for the condition of uniform flow. Derive Chezy's uniform flow formula. **10**

b) Define specific force. Derive the relationship between sequent depths in a rectangular channel. In a rectangular channel, there occurs a jump corresponding to $F_r = 2.5$. Determine the critical depth and head loss in terms of the initial depth y_1. **10**

Module – II

IV. a) Derive the relation between water surface slope and channel bottom slope. Explain the characteristics of surface profile in prismatic channel. **10**

b) Explain the steps of computation of length of surface profile by direct step method. **10**

OR

V. a) Explain Model Laws. What is the application of model laws in engineering ? **10**

b) A rectangular channel 7.5 m wide has a uniform depth of flow of 2.0 m and has a bed slope of 1 in 3000. If due to weir constructed at the downstream end of the channel, water surface at a section is raised by 0.75 m, determine the water surface slope with respect to the horizontal at this section. Assume Manning's n = 0.025. **10**

Module – III

VI. a) i) Explain the terms :
a) Manometric efficiency b) Priming of centrifugal pump.

ii) Draw the characteristic curves for an axial flow pump. **10**

b) A centrifugal pump works at a speed of 1000 r.p.m. and manometric head is 14.5 m. the vane angle at outlet is 30° with the periphery. The diameter of the impeller at outlet is 30 cm and the width is 5 cm. Find the discharge of the pump if the manometric efficiency is 95%. **10**

OR

VII. a) What is meant by draft tube ? Explain different types. **10**

b) What is the role of air vessel in the smooth functioning of reciprocating pump ? **10**