

Printed Pages—3

ME—604

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 4052

Roll No.

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B.Tech.

SIXTH SEMESTER EXAMINATION, 2005-2006

FLUID MACHINERY

Time : 3 Hours

Total Marks : 100

- Note :**
- (i) Answer **ALL** questions.
 - (ii) All questions carry equal marks.
 - (iii) In case of numerical problems assume data wherever not provided.
 - (iv) Be precise in your answer.

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1. Attempt **any four** parts of the following : (5x4=20)
- (a) Define Dynamic force. How is it distinguished from hydrostatic pressure ?
 - (b) Derive impulse momentum equation.
 - (c) How is the absolute path of jet falling on a moving vane determined ?
 - (d) Derive an expression for the dynamic force exerted by fluid jet on a stationary inclined plate.
 - (e) State the functions of the casing of a Pelton turbine. Why has it no hydraulic function to perform ?
 - (f) What should be the qualities of a governor ?

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2. Attempt *any four* parts of the following : (5x4=20)

- (a) Show with the help of a line sketch as to how the speed of a reaction water turbine is governed by servomotor.
- (b) Prove that a draft tube prevents for the loss of head of reaction turbine.
- (c) Describe briefly an inward flow turbine.
- (d) Why does it become necessary to install a water turbine below the tail race level ?
- (e) What is specific speed and how does it differ in definition from the other specific quantities ?
- (f) Draw the following characteristics of a Kaplan turbine :
 - (i) P_t vs N_1 and
 - (ii) P_1 vs Q_1

3. Attempt *any two* parts of the following : (10x2=20)

- (a) What are the functions of a volute casing of a centrifugal pump ?
- (b) Define specific speed of a centrifugal pump and derive an equation for the same.
- (c) A centrifugal pump impeller has diameter at inlet and outlet as 360mm and 720mm respectively. The flow velocity at outlet is 2.4 m/s and the vanes are set back at an angle of 45° at the outlet. If the manometric efficiency is 70%, calculate the minimum starting speed of the pump.

4. Attempt *any two* parts of the following : (10x2=20)
- (a) Define slip, negative slip and coefficient of discharge of a reciprocating pump.
 - (b) Explain with the help of delivery curves, how the resultant rate of discharge can be made uniform in different types of reciprocating pumps.
 - (c) Why is the speed of reciprocating pump lower than that of centrifugal type ? On what factors does the speed of the reciprocating pump depend ?
5. Attempt *any two* parts of the following : (10x2=20)
- (a) What is the difference between a hydraulic coupling and a hydraulic torque converter ? Where are they used in practice ?
 - (b) With the help of a neat sketch explain the working of a hydraulic press. Where is a hydraulic press used ?
 - (c) Differentiate a hydraulic lift and crane. How do these differ in working principle ?

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