Roll No. .....

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B. Tech. 5th Semester (ME) Examination – March, 2021

FLUID MACHINES

Paper : PCC-ME-309-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Section. Question No. **1** is ***compulsory***. All questions carry equal marks.

1. (a) Define the terms impact of jet and jet propulsion.

(b) Classification of hydraulic turbines.

(c) Show the main parts of Kaplan turbine by figure.

(d) Types of casing adopted for Centrifugal pump.

(e) Hydraulic Press.

(f) Differentiate between Centrifugal pumps and Reciprocating pumps. $2.5 \times 6 = 15$

SECTION – A

2. Derive an expression for force exerted by a jet of water on series of vanes. Also find the value of maximum efficiency. 15

3. Define governing of impulse turbine. Draw and explain the characteristic curves of hydraulic turbines. 15

SECTION – B

4. Define radial flow reaction turbine and also explain its main parts. Derive an expression for work done and hydraulic efficiency of inward flow reaction turbine using velocity triangles. 15

5. A conical draft tube having diameter at top as 2.0 m and pressure head at 7 m of water (vacuum), discharge water at outlet with velocity of 1.2 m/s at the rate of 25 m^3/s. If atmospheric pressure head is 10.3 m of water and looses between inlet and outlet of draft tubes are negligible, find the length of draft tube immersed in water. Total length of tube is 5 m. 15

SECTION – C

6. Explain the function of multistage of centrifugal pumps. Define the term cavitations, its effects and methods to reduce cavitations. 15

7. What are the various methods of dimensions analysis to obtain a functional relationship between various parameters affecting a physical phenomenon ? Describe with an illustration. 15

SECTION – D

8. Write an expression for discharge, work done and power required to drive a double acting reciprocating pump. Explain the term slip in reciprocating pump. 15

9. Write short notes on : $5 \times 3 = 15$

   (i) Hydraulic intensifier

   (ii) Hydraulic Ram

   (iii) Hydraulic crane
