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Reg. No. : .....

Name : .....

Third Semester B.Tech. Degree Examination, January 2015

(2008 Scheme)

08.303 : FLUID MECHANICS AND MACHINES (MPU)

Time : 3 Hours Max. Marks : 100

Instructions *: i) Answer* ***all*** *questions from Part* ***A***.

ii) Answer ***one full*** *question from* ***each*** *Module in Part* ***B***.

iii) Assume ***any missing*** *data* ***suitably***.

PART – A

1. State the advantages of mechanical pressure gauge over manometers.
2. Describe about a Pitot-static tube.
3. Distinguish between Laminar and Turbulent flow in pipes.
4. Prepare a short notes on Water Hammer.
5. Describe briefly the function of Draft Tube.
6. Derive an expression for specific speed of a Turbine.
7. List down the constructional features of a Kaplan Turbine.
8. Explain the classification of pumps.
9. Explain the working of Lobe Pump.
10. What is priming ? Why is it necessary ? **(10×4=40 Marks)**

P.T.O.

PART – B

Module – I

11. a) What is a Venturimeter ? Derive an expression for discharge through a Venturimeter. 10

    b) A pipeline carrying oil of specific gravity 0.87 changes in diameter from 200 mm at a position A to 500 mm diameter at position B. Which is 4 m at a higher level. If the pressures at A and B are 1 bar and 0.6 bar respectively and the discharge is 0.2 m^3/s. Find the loss of head and direction of flow. 10

12. a) Prove and interpret the Darcy-Weisbach equation for turbulent flow through circular pipe of constant diameter. 10

    b) What is equivalent pipe ? Derive an expression for equivalent size of pipe. 10

Module – II

13. a) What are the important component parts of a Impulse Turbine and what are their functions ? 10

    b) It is desired to generate 1000 kW of power and survey reveals that 450 m of static head and a minimum flow of 0.3 m^3/s is available. Comment whether the task can be accomplished by installing a Pelton wheel that turns at 1000 rpm and has an efficiency of 80%. 10

14. a) What is meant by cavitation ? What is Thoma's cavitation factor ? Explain its significance for water turbines. 10

    b) Explain the factors which decide the choice for a particular hydraulic turbine for a hydro-power project. 10

Module – III

15. a) Enumerate the salient points of difference between centrifugal and reciprocating pumps. **10**

    b) A pump impeller is 37.5 cm diameter and it discharges water with velocity components of 2 and 12 m/s in the radial and tangential 2 directions respectively. The impeller is surrounded by a concentrical cylindrical chamber with parallel sides, the outer diameter being 45 cm. If the flow in the chamber is a free spiral vertex, find the component velocities of water on leaving and the increase in pressure if there is no loss. **10**

16. Prepare short notes on following :

    a) Shape Numbers.

    b) Indicator diagram.

    c) Manometric head.

    d) Hydraulic Ram. **(4×5=20 Marks)**

(3×20=60 Marks)