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C14-M–405

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BOARD DIPLOMA EXAMINATION, (C-14)

MARCH/APRIL—2021

DME - FOURTH SEMESTER EXAMINATION

FLUID MECHANICS AND HYDRAULIC MACHINERY

Time : 3 hours] [*Total Marks* : 80

PART—A

4×5=20

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **four** marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Define the terms *(a)* Density and *(b)* Specific volume

2. State the units of *(a)* Pressure and *(b)* Specific gravity.

3. Classify types of fluid flow.

4. Write the continuity equation of flow of liquids.

5. Write Darcy's equation for the loss of head due in pipes due to friction.

6. State the condition for maximum power transmitted through a pipe.

7. Write the equation for normal force exerted by the jet on stationary inclined flat plate with a neat diagram.

8. List the applications of water turbines.

9. Write the classification of hydraulic turbines according to the direction of flow of water in the runner.

10. How hydraulic pumps are classified?

PART—B

15×4=60

Instructions : (1) Answer *any* **four** questions.

(2) Each question carries **fifteen** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. Explain the principle of measurement of pressure by a Bourdon pressure gauge with a neat sketch.

12. State Bernoulli's equation and explain its one practical application in hydraulics with a neat sketch.

13. Water flows through a pipe 250 mm in diameter and 60 m long with a velocity of 3 m/s. Find the loss of head due to friction by using *(a)* Darcy's formula if f = 0·005 and *(b)* Chezy's formula if C = 55.

14. A jet of water moving with a velocity of 20 m/s strikes normally on a plate. The jet diameter is 50 mm. Determine the force on the plate when *(a)* the plate is fixed and *(b)* the plate is moving with a velocity of 6 m/s.

15. Explain the working of Pelton wheel with a neat sketch.

16. *(a)* Derive an expression for the normal force and work done by jet on an inclined plate moving in the direction of jet.

(b) Write any three differences between impulse turbine and reaction turbine.

17. Describe the working of centrifugal pump with a neat sketch.

18. Explain the working of a submersible pump with a neat sketch.

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