



C09-M-406

3506

BOARD DIPLOMA EXAMINATION, (C-09)

SEPTEMBER/OCTOBER - 2020

DME—FOURTH SEMESTER EXAMINATION

HYDRAULICS AND FLUID POWER SYSTEMS

Time : 3 hours]

[Total Marks : 80

PART—A

3×10=30

Instructions : (1) Answer **all** questions.

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

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

(4) Take specific weight of water is 9.81 kN/m^3 .

(5) Take specific gravity of mercury is 13.6.

1. Define pressure of a fluid and write SI unit for it.

2. List the different types of fluid flows.

3. What are the uses of syphon?

4. Find the force of jet impinges on a fixed and vertical flat plate by a horizontal water jet of velocity 10 m/sec, with a jet diameter of 35 mm.

5. What are the differences between impulse and reaction turbines?

6. Define specific speed of a turbine.

- * 7. State the use of air vessel in reciprocating pump.
8. What are the essential components of a hydraulic circuit?
9. Write the applications of pneumatics.
10. What is a hydro-pneumatic system?

PART—B

10×5=50

- Instructions :** (1) Answer *any five* questions.
 (2) Each question carries **ten** marks.
 (3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.
 (4) Take specific weight of water is 9.81 kN/m^3 .
 (5) Take specific gravity of mercury is 13.6.

11. Calculate the specific weight, density and specific gravity of a liquid having a volume of 6.25 m^3 and weights 57 kN. Take density of water as 1000 kg/m^3 .
12. A 50 m long pipe is placed at an angle of 30° with horizontal. At the higher end, the diameter of pipe is 210 mm which is gradually increases to 310 mm at the lower end where the pressure is 260 kPa. If discharge through the pipe is 160 lit/sec of water, find the pressure at the upper end.
13. In a water power scheme, the water is available at a head of 200 m and carried through a pipe length of 800 m. Determine the minimum diameter of the pipe that will convey water for an output of 1000 kW at 80% efficiency. Take $f = 0.008$.
- * 14. A jet of water of diameter 10 cm strikes a flat plate normally with velocity of 15 m/sec. The plate is moving with a velocity of 6 m/sec in the direction of jet and away from the jet. Find (a) force exerted by jet on the plate, (b) work done by jet on the plate per sec and (c) efficiency of the jet.

- * 15. A Pelton wheel working under a head of 475 m produces 12500 kW at 600 r.p.m. If the overall efficiency of the wheel is 85% and speed ratio is 0.45, determine (a) discharge of the turbine, (b) diameter of the wheel and (c) diameter of the nozzle.
16. Explain the construction and working principle of single-acting reciprocating pump.
17. What are the different types of hydraulic accumulators? Explain any one of them.
18. Explain pneumatic clamp with a neat sketch.
