



**C16-M-402**

**6447**

**BOARD DIPLOMA EXAMINATION, (C-16)**

**OCTOBER/NOVEMBER—2024**

**DME – FOURTH SEMESTER EXAMINATION**

**HYDRAULIC AND FLUID POWER CONTROL 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.

1. Define (a) Surface tension and (b) Mass density.
2. State Bernoulli's theorem and write down the equation.
3. Write down Darcy's equation for loss of head due to friction in terms of discharge in a pipe flow and mention units of each term.
4. Write any three differences between Impulse and Reaction turbines.
5. What is priming? Why is it necessary?
6. A jet of water 50 mm diameter strikes a flat vertical stationary plate normally with a velocity of 30 m/s. Find the force exerted by the plate.
7. List out any six applications of hydraulic power system.
8. State any three advantages of hydraulic power system.
9. List out any three materials used for seals.
10. State any three functions of direction control valve.

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1

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## PART—B

10×5=50

- Instructions :** (1) Answer *any five* questions.  
(2) Each question carries **ten** marks.  
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. Explain the working of a differential U-tube manometer with a neat sketch and derive the expression for pressure head.
12. A venturimeter having throat diameter 100 mm is used for measuring the flow rate of oil of specific gravity 0.8 in a pipe of diameter 200 mm. The oil-mercury differential gauge shows a deflection of 250 mm. Find the discharge of oil, if the coefficient of discharge of venturimeter is 0.98.
13. Water is supplied from a reservoir through a 300 mm diameter pipe 600 m long to a turbine which is situated 108 m below the free surface of water. Discharge through the pipe is 81 lit/sec. Find the head loss and the power transmitted by the pipe. Take friction factor,  $f = 0.01$ .
14. A 20 mm diameter jet of water moving with a velocity of 20 m/s strikes on flat vertical plate normally. Find the force exerted if the plate moves with a velocity of 5 m/s in the direction of the jet. Find also the work done and efficiency. Take specific weight of water =  $9810 \text{ N/m}^3$  and  $g = 9.81 \text{ m/s}^2$ .
15. Explain the working of Pelton wheel with a neat sketch.
16. Explain the construction details of centrifugal pump with a neat sketch.
17. Explain the functions of the elements of hydraulic circuit with a neat sketch.
18. Compare the pneumatic circuit with hydraulic circuit in any five aspects.

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