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Register No.:

April 2024

Time – Three hours
(Maximum Marks: 100)

- [N.B. 1. Answer all questions under Part-A. Each question carries 3 marks.
2. Answer all the questions either (A) or (B) in Part-B. Each question carries 14 marks.]

PART – A

1. Define density and give its unit.
2. Define gauge pressure and vacuum pressure.
3. State uniform and non-uniform flow.
4. What is impact of jet?
5. What is priming? List out the different methods of priming.
6. Define co-efficient of discharge.
7. List out the major elements of hydraulic system.
8. Define actuators and classify them.
9. What are the functions of an air filter?
10. Draw the ISO symbol for compressor and air motor.

PART – B

11. (a) Explain the construction and working of Bourdon tube pressure gauge with neat sketch.

(Or)

- (b) A Differential manometer connected to two pipes A and B. The pipe A contains carbon tetra chloride having relative density 1.594 under a pressure of 118 kN/m^2 . The pipe B contains oil of specific gravity 0.8 under a pressure of 200 kN/m^2 . The pipe A lies 2.5 m above pipe B. The centre of pipe B is at the level of free surface of mercury in the pipe A. Find the difference in mercury level.

[Turn over.....

12. (a) Derive an expression for the discharge through an Orifice meter.

(Or)

- (b) Water is supplied to a polytechnic campus having 3000 students from reservoir which is built 5 km away from the campus. Each student requires 25 litres of water per day. Half of the daily requirement is pumped in 8 hours. The diameter of water supply pipe is 150mm. determine the loss of head due to friction, if $f = 0.008$

13. (a) Explain the construction and working of Pelton wheel turbine with a neat sketch.

(Or)

- (b) (i) Water is lifted to a height of 18 meter by a double acting reciprocating pump having a bore of 150mm and a stroke of 300mm. If the pump has a speed of 40 rpm, find the theoretical power required. If it has an actual discharge of 400 litres per minute, find the theoretical discharge and co-efficient of discharge.(9)
- (ii) A single acting reciprocating pump has a plunger of 500 mm diameter and stroke of 0.4 m. The speed of the pump is 60 rpm and C_d is 0.97. Find Actual discharge of pump.(5)

14. (a) Explain the construction and working of hydraulic intensifier with a neat sketch.

(Or)

- (b) Draw and explain the hydraulic circuit for table movement of milling machine.

15. (a) Explain the construction and working of pressure regulating valve with neat sketch.

(Or)

- (b) (i) Explain the construction and working of double acting cylinder with a neat sketch.(7)
- (ii) Explain the construction and working of quick exhaust valve with a neat sketch.(7)
