

November 2022

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.
2. What is manometer? State its types.
3. State Laminar and turbulent flow.
4. State the laws of fluid friction for laminar flow.
5. Write any three differences between Kaplan and Francis turbine.
6. What is separation?
7. Write about hydraulic Systems.
8. Write the working principle of single acting cylinder with the aid of ISO symbol.
9. Classify the compressors.
10. State the purpose of relief valve in a pneumatic system.

PART - B

11. (a) State and prove Pascal's Law.

(Or)

- (b) A differential manometer connected to two pipes reads 250mm of mercury. Water flows through one pipe and oil through the other. Find the pressure difference between two pipes if the level of pipes are same. The pressure of water is greater than the pressure of oil and the height of water column from the centre of pipe of level of mercury is 450mm. Take relative density of oil as 0.8.

[Turn over.....

12. (a) A pipe 300 m long has a slope of 1 in 100 tapers from 1.5 m diameter at the higher end 0.625 m diameter at the lower end. The discharge of water through the pipe is 100 liters/sec. If the pressure at the higher end is 110 kN/m^2 , find the pressure at the lower end.

(Or)

- (b) Water is supplied to factory from a hydro power station by means of a pipe of 200 mm diameter and 12 km long. The pressure at the power station is 45000 kN/m^2 . Find the maximum power that can be transmitted to the factory. Assume $F=0.028$.

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

(Or)

- (b) Explain the construction and working of single acting reciprocating pump with neat sketch.

14. (a) Explain construction and working of hydraulic pressure relief valve with neat sketch.

(Or)

- (b) Draw and explain the circuit diagram for the operation of double acting cylinder with metering out control.

15. (a) Explain the construction and working of Single stage reciprocating compressor unit with neat sketch.

(Or)

- (b) Draw and explain the operation of double acting cylinder using speed control circuit.
