

April 2019

Time – Three hours
(Maximum Marks: 75)

- [N.B: (1) Q.No. 8 in PART – A and Q.No. 16 in PART – B are compulsory.
Answer any FOUR questions from the remaining in each PART – A
and PART – B
(2) Answer division (a) or division (b) of each question in PART – C.
(3) Each question carries 2 marks in PART – A, 3 marks in Part – B
and 10 marks in PART – C.]*

PART – A

1. Define specific weight of a fluid.
2. Define Pascal's law.
3. Define uniform flow of fluid.
4. Write any two differences of Francis and Kaplan turbines.
5. Differentiate plunger and piston pumps.
6. List out the important elements of pneumatic systems.
7. Define de-emulsibility.
8. Define hydraulic gradient line.

PART – B

9. Differentiate gauge pressure, vacuum pressure and absolute pressure.
10. Write short notes on hydraulic press.
11. State any three assumptions made in Bernoulli's theorem.
12. Derive an expression for the force exerted and work done by the jet on a series of moving plates.
13. Write short notes on FRL unit.
14. Compare hydraulic system with pneumatic system.
15. Explain the working of any one type of accumulator.
16. Differentiate metering-in and metering-out circuits.

PART – C

17. (a) Explain with a sketch, the working principle of a Bourdon's tube pressure gauge. Mention its applications.

(Or)

- (b) (i) Explain the pressure measurement by inclined tube micro manometer.
(ii) The vacuum pressure in a pipe line carrying water was measured by U-tube manometer. The difference of mercury between the limbs is 0.05m and the free surface of mercury in the open limb is 0.1m below the centre line of the pipe. Find the absolute pressure head in the pipe in terms of metre of water.

18. (a) A pipe line is carrying water at a point A the diameter is 600mm, the pressure is 70 kN/m^2 and the velocity is 2.4 m/sec . At another point B which is 2m higher than A in the same pipe, the diameter is 300mm and the pressure is 14 kN/m^2 . Determine the direction of flow.

(Or)

- (b) (i) Derive the Chezy's formula for the loss of head due to friction in pipes
(ii) A pipe of 1m diameter and 1km long delivers water to a town at the rate of $10 \text{ m}^3/\text{sec}$. Calculate the loss of head due to friction if $f=0.04$.

19. (a) With a neat sketch, explain the working of Pelton wheel.

(Or)

- (b) Explain the construction and working of submersible pump with neat sketch.

20. (a) Draw a pneumatic circuit for the direct control of single acting cylinder and explain.

(Or)

- (b) Draw the pneumatic circuit for the automatic operation of double acting cylinder and explain.

21. (a) (i) Explain spring loaded accumulator with sketch.
(ii) Explain the working of pressure intensifier with a neat sketch.

(Or)

- (b) (i) Explain the operation of internal gear pump with neat sketch.
(ii) Explain the hydraulic circuit with ISO symbols for the quick return motion of a shaper.
