

## Model Question Paper

[Note: (i) Answer all the ten questions in part A. Each question carries three marks.

(ii) Answer either (A) or (B) of each question in part B. Each question carries fourteen marks.

### PART - A (10 x 3 = 30 Marks)

1. State pascal's law and mention its applications.
2. If is a liquid weights 100N and occupies  $2.5\text{m}^3$ , find its density and specific weight.
3. Compare venturimeter with orificemeter.
4. Mention any three minor losses that occur in flow through pipe.
5. List the different types of accumulators.
6. Name the basic components required in hydraulic system.
7. Write any three comparison of pneumatic, hydraulic and hydro pneumatic.
8. Write about muffler.
9. Mention the types of hydro-pneumatic circuits.
10. Draw the symbol of 4/3 DCV.



**PART - B (5 x 14 = 70 Marks )**

**Note : Answer ALL questions by choosing either A or B**

11. A i) The pressure of water in a pipe line was measured by means of a simple manometer containing mercury . The mercury level in the open tube is 150 mm higher then that of the left tube . The height of water level in the left tube is 40 mm . Determine the pressure in the pipe i) in m of water ii )  $\text{KN /m}^2$  ( 7 )

ii) Explain the working of Bourdon' s tube pressure guage with a simple sketch . ( 7 )

**(OR)**

B i) State and prove Pascal's Law. ( 7 )

ii ) A Differential manometer connected to two pipes A & B . The pipe A contains carbon tetra chloride having relative density 1.594 under a pressure of  $118 \text{ KN/m}^2$  .The pipe B contains oil of specific gravity 0.8 under a pressure of  $200 \text{ KN /m}^2$  . The pipe A lies 2.5 m above pipe B . The center of pipe B is at the level of face surface of mercury in the pipe A .Find the difference in mercury level. ( 7 )

**(OR)**

12. A i) A pipe line is carrng full of water at a point 'A' in the pipe line the diameter is 600 mm and the pressure is  $70 \text{ KN/m}^2$  and velocity is 2.4 m/sec . At another point B in the same pipe line the diameter is 300 mm and the pressure is  $70 \text{ KN/m}^2$  and is 2 m higher than 'A' . Determine the direction of flow. (7)



ii) State and prove the Bernoulli's Equation. (7)

(OR)

B i) Using chezy's formula find the loss of head due to friction in a pipe 800 mm dia and 36 m long . The velocity of flow is 2m/sec . Take Chezy's constant  $C = 100$  (7)

ii) Explain the construction and working of pelton wheel turbine with neat sketch . (7)

13. A i) Explain the external gear pump with neat sketch (8)

ii) Explain the working of vane type hydraulic motor with suitable sketch (7)

(OR)

B i) Explain the construction and working of counterbalance valve. (7)

ii) Explain the working principle of spring loaded accumulator. (7)

14. A i) Draw and explain the Air - oil cylinder system (7).

ii) Explain the table movement of milling machine with a hydraulic circuit . (7)

(OR)

B i) Compare pneumatic , hydraulic and hydro-pneumatic system . (7)

ii) Draw a two hand safety circuit and explain its working. (7)

15. A i) Explain FRL unit with neat sketch . (7)



ii) Explain the working of shuttle valve with neat sketch.  
( 7 )

(OR)

B i) Explain the pneumatic circuit for the automatic operation of double acting cylinder .

( 7 )

ii) Draw a circuit and explain the operation of double acting cylinder with metering - in and metering -out control  
( 7 )