

22345

23242

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.

Marks

1. Attempt any FIVE of the following :

5 × 2 = 10

- (a) Define surface tension.
- (b) Draw a neat sketch of Bourdon's pressure gauge.
- (c) State the Bernoulli's theorem.
- (d) State merit and limitation of hydraulic system (any two).
- (e) Draw a neat sketch of 4/2 DCV valve with its symbol.
- (f) Define cavitation in centrifugal pump.
- (g) Draw a neat sketch of Quick Exhaust Valve.

2. Attempt any THREE of the following :

3 × 4 = 12

- (a) List out minor losses in pipe fitting with neat sketches.
- (b) What are the effect of contaminants in the oil ?
- (c) What is FRL unit ? Explain its function with the help of sketch and draw separate and combined symbol of FRL unit.
- (d) Explain the concept of Absolute vacuum, Gauge pressure and Atmospheric pressure with a neat diagram.



3. Attempt any THREE of the following :

3 × 4 = 12

- (a) Describe the working of sequencing circuit in hydraulic system.
- (b) Suggest suitable system with reasoning for following application :
- JCB
 - Robot arm
 - Universal Testing M/cs.
 - Bolt Tightening Gun
- (c) Describe the following terms :
- Ideal fluids
 - Real fluids
- (d) Write Darcy's formula for head loss due to friction. State the meaning of each terms.

4. Attempt any THREE of the following :

3 × 4 = 12

- (a) Rearrange the following components and draw block diagram of general pneumatic system.
- Flow control valve
 - Direction control valve
 - FRL unit
 - Actuator
- (b) From Figure no. 01 to study the diagram and identify the valve activation types (any **four**).

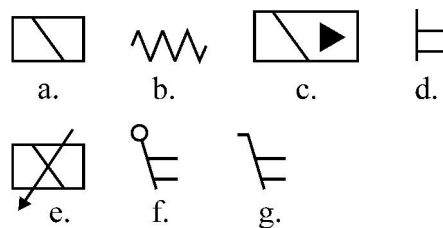


Fig. No. 1

- (c) To study the given figure no. 02 and answer the following question :

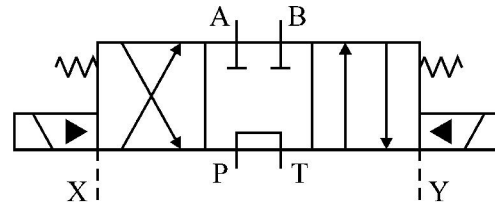


Fig. No. 2

- (i) Identify the component and state its function.
 - (ii) State its application
- (d) “Flow control valve play the important role in hydraulic system.” Justify your answer.
- (e) A rectangular plate 3 meter long and 1 m wide is immersed vertically in water in such a way that 3 meter side is parallel to the water surface and is 1 meter below it. Find :
- (i) Total pressure on the plate &
 - (ii) Position of centre of pressure

5. Attempt any TWO of the following :

2 × 6 = 12

- (a) Explain construction and working of venturimeter with its neat sketches.
- (b) Classify pneumatic actuators on the basis of (i) Motion (ii) Mode of action (iii) Displacement (iv) Describe telescopic cylinder with sketch.
- (c) From a given hydraulic circuit answer the following questions (figure no. 3) :

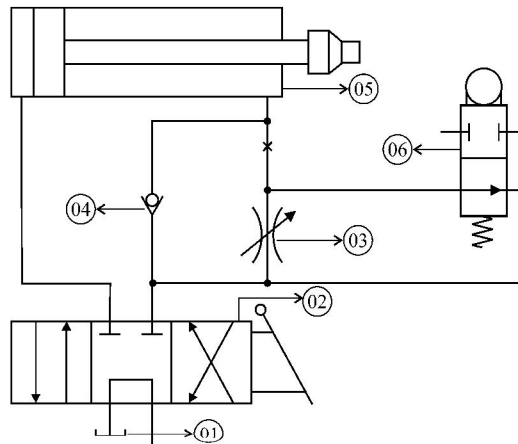


Fig. No. 3

- (i) Name the component represented by arrow.
- (ii) Name the circuit and gives its application.

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P.T.O.

6. Attempt any TWO of the following :

2 × 6 = 12

- (a) Why pressure relief valve is used in hydraulic circuit ? Justify your answer with neat sketches.
- (b) Below some problems are mentioned, write probable causes and remedy of it.
- Excessive noise in hydraulic pump
 - Excessive heat in oil
 - Pressure control valve not functioning correctly
 - Pressure not building in air receiver
- (c) From a given pneumatic circuit answer the following questions (figure no. 04) :

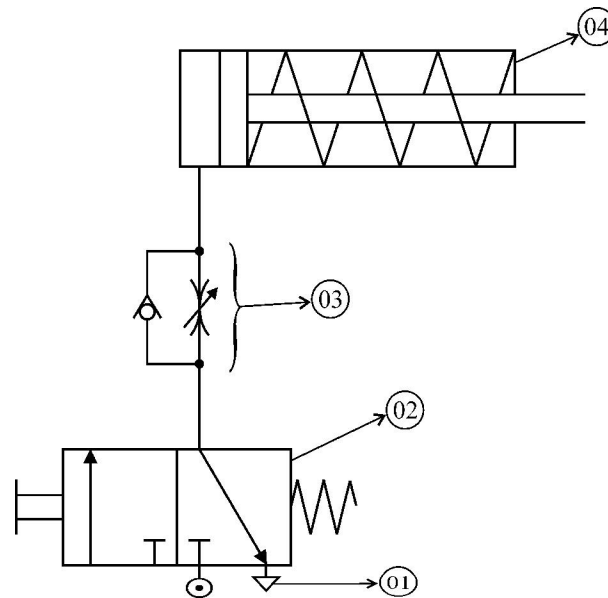


Fig. No. 4

- Redraw the pneumatic circuit and identify the component. 4
- State its application. 2
