

# 22655

**12526**

**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 answer with neat sketches wherever necessary.
- (4) Figures to the right indicate full marks.
- (5) Assume suitable data, if necessary.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

- 1. Attempt any FIVE of the following: **10****
- a) State the common applications of Hydraulic System.
- b) State the desired properties of hydraulic oil used in hydraulic system.
- c) State the meaning of positive displacement pump (PDP) and non-positive displacement pump (NPDP).
- d) Draw the neat sketch of telescopic cylinder.
- e) State the function of check valve.
- f) List the functions of seals.
- g) Represent the following pneumatic components with neat ISO symbols :-
- i) Twin pressure valve
- ii) Shuttle valve.

P.T.O.

- 2. Attempt any THREE of the following: 12**
- a) Compare hydraulic system with pneumatic system.
  - b) Explain construction and working of External Gear Pump with neat sketch.
  - c) Draw and explain working and construction of 4/2 spool type DC valve.
  - d) State detail classifications of compressor.
- 3. Attempt any THREE of the following: 12**
- a) Explain the working of swash plate axial piston type hydraulic motor.
  - b) Explain the working of pressure compensated flow control valve used in hydraulic system.
  - c) Explain with neat sketch Meter in circuit for hydraulic system.
  - d) Draw and explain Bleed-off hydraulic circuit.
- 4. Attempt any THREE of the following: 12**
- a) State different actuation methods of direction control valves with their ISO symbols.
  - b) Explain with neat sketch working of direct acting pressure relief valve.
  - c) State the function of accumulator. Explain any one type of accumulator with neat sketch.
  - d) Draw a hydraulic circuit for the application which requires a slow forward stroke and rapid return stroke. Name the circuit and suggest its application with proper justification.
  - e) Draw and explain the pneumatic circuit for speed control of bidirectional air motor.

**5. Attempt any TWO of the following:****12**

- a) One application needs a single acting cylinder capable of giving longer stroke strength. However the space available to fit in that cylinder in retracted condition is comparatively less. Suggest the type of actuator to be used in such condition with justification. Explain with neat sketch.
- b) A certain application uses two double acting cylinders. A cylinder moves first in forward direction and after completion of its forward stroke, second cylinder moves in forward direction. Both cylinder returns simultaneously. Suggest the pressure control valve for the application. Draw and explain the circuit.
- c) State the application of FRL unit used in pneumatic system. Explain its working with neat sketch.

**6. Attempt any TWO of the following:****12**

- a) Explain the function of unloading valve with a suitable example of hydraulic circuit.
  - b) List common faults observed in hydraulic and pneumatic system. Suggest the remedies for the faults.
  - c) It is required to delay the controlling action by some time after the actuation of DC valve. Select the suitable valve for this application and explain its working with a pneumatic circuit.
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