

22474

24225

3 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
(2) Illustrate your answers with neat sketches wherever necessary.
(3) Figures to the right indicate full marks.
(4) Assume suitable data, if necessary.
(5) 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) Define dynamic viscosity and kinematic viscosity.
 - b) State the function of actuator.
 - c) Draw symbols of oil filter and accumulator.
 - d) List any two applications of sequencing circuit.
 - e) State the function of FRL unit.
 - f) State the different logic gates used in a pneumatic system.
 - g) Draw the symbol of 3/2 solenoid operated spring return valve.
2. **Attempt any THREE of the following :** **12**
- a) Write the Bernoulli's Equation and explain the terms in it.
 - b) Explain the working of internal gear pump with neat sketch.
 - c) Explain with neat sketch of Hydraulic circuit used in shearing machine.
 - d) Draw the circuit diagram for surface grinding operation by using bidirectional pneumatic motor.

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- 3. Attempt any THREE of the following :** **12**
- a) Compare gear pump and vane pump on the basis of:
 - i) Construction
 - ii) Speed
 - iii) Application
 - iv) Pressure
 - b) Explain the causes and remedies in the oil hydraulic system.
 - c) Explain general layout of the pneumatic system.
 - d) Explain the construction and working of twin pressure valve as a AND Gate.
 - e) Explain the causes and remedies in the oil pneumatic system.
- 4. Attempt any THREE of the following :** **12**
- a) Draw pilot control hydraulic circuit for any one application.
 - b) Compare between meter in and meter out circuit.
 - c) State the function of proportional control valve and give any two applications.
 - d) Explain the working of two-stage reciprocating compressor.
 - e) Explain with neat sketch 4/3 direction control valve.
- 5. Attempt any TWO of the following :** **12**
- a) Compare the Hydraulic, Pneumatic and Electric systems on the basis of –
 - i) Power/Energy transmitting media
 - ii) Ease of design/construction
 - iii) Suitable for application
 - iv) Fire proof
 - v) Cleanliness
 - vi) Cost

- b) Explain with a neat sketch of an air pilot control circuit for a double acting cylinder.
- c) A pneumatic operated machine holds the steel sheet and then punches a hole. The sheet is released when the punch goes back. Suggest and draw the suitable circuit for this situation.

6. 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 its working with sketch.
 - b) Explain with neat sketch - 'Time Delay Valve'.
 - c) Construct an electro-hydraulic circuit of a single-acting cylinder with a 3/2 solenoid operated spring return valve.
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