

Total No. of Questions : 12]

SEAT No. :

P1192

[4659]-55

[Total No. of Pages : 3

B.E.(Mechanical– SW)

INDUSTRIAL HYDRAULICS & PNEUMATICS

(2008 Pattern) (402062)(Semester-I)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) *Answer 3 questions from Section I and 3 questions from Section II.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- 6) *Assume suitable data, if necessary.*

SECTION-I

- Q1)** a) Compare Fluid power system with other systems. [6]
- b) What are the criterias for selection of oils for a hydraulic system. [6]
- c) Explain static and dynamic seals. [6]

OR

- Q2)** a) Explain types of contamination. How contamination can be avoided in hydraulic system? [6]
- b) What are quick connecting and disconnecting type of couplings used in Fluid power systems. [6]
- c) State type of filters and where they are located in hydraulic system. [6]
- Q3)** a) Explain with a sketch the different parts of a typical reservoir assembly. [8]
- b) Sketch an balanced vane pump and explain its working. [8]

OR

P.T.O.

- Q4)** a) The displacement of a pump operating at 1000 rpm at a pressure of 70 bars is 100cm^3 . The input torque from the prime mover is 120Nm. If it delivers $0.0015\text{ m}^3/\text{s}$ of oil, determine [8]
- i) Volumetric efficiency
 - ii) Mechanical efficiency
 - iii) Overall efficiency
 - iv) Theoretical torque required to operate the pump.
- b) Draw the characteristics curves for a positive displacement pump and explain them. [8]

- Q5)** a) What is an accumulator? State different types of accumulators. Explain any one accumulator with a sketch. [8]
- b) What are the different centre positions used in DCV. Give advantages and disadvantages of each. [8]

OR

- Q6)** a) Explain the difference between direct and pilot operated pressure relief valve. [8]
- b) Sketch and explain a pressure compensation type of flow control valve. [8]

SECTION-II

- Q7)** a) Explain any four types of Linear actuators with neat sketch. [8]
- b) Draw a regenerative circuit and state its applications. [8]

OR

- Q8)** a) Explain with a circuit the hydraulic braking circuit. [8]
- b) Draw a hydraulic motor circuit with meter-out flow control. The flow control is required for both directions of rotation. [8]
- Q9)** a) Explain typical compressed air generation and distribution system. [8]
- b) Compare hydraulic and pneumatic systems. [5]
- c) Why is pneumatic control system termed as low cost automation. [5]

OR

- Q10)** a) What is the purpose of quick exhaust valve? Where are these valves installed? [6]
- b) Draw a sketch of a 'Regulator' used in pneumatic system. Explain its working and purpose in the system. [6]
- c) State different compressors used in pneumatic system. What is the selection criteria of compressor. [6]

Q11) a) What is a manufacturer's catalogue. How it helps to design a Fluid Power system? [6]

- b) Sequential operations of two pneumatic cylinders are required as follows:
- i) Cylinder 'A' extends
 - ii) Cylinder 'B' extends
 - iii) Cylinder 'B' retracts
 - iv) Cylinder 'A' retracts

Develop a pneumatic circuit using starting valve, pilot operated 4/2 direction control valve and cam/roller operated valves to maintain the above sequence. Do not use solenoid-operated valves. [10]

OR

- Q12)** a) Explain with an example the steps involved in designing a hydraulic circuit. [8]
- b) Draw a circuit for a high capacity hydraulic press. Discuss how you will choose the different components used in the above circuit. [8]

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