

# CBCS SCHEME

USA

15ME72

Seventh Semester B.E. Degree Examination, July/August 2021

## Fluid Power System

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions.

- 1 a. State Pascals law. Explain in brief the advantages and applications of fluid power systems. (08 Marks)  
b. Explain in brief any EIGHT desirable properties of hydraulic fluids. (08 Marks)
- 2 a. Explain the following:  
(i) Static and Dynamic seals. (09 Marks)  
(ii) Sealing materials. (07 Marks)  
(iii) Effect of temperature on hydraulic fluid.  
b. What is a strainer? With a neat sketch explain proportional type filter. (07 Marks)
- 3 a. Explain the construction and working of balanced vane pump with neat sketch. Also explain the performance characteristics of a vane pump. (12 Marks)  
b. A hydraulic motor has a volumetric displacement of  $125 \text{ cm}^3$  and a pressure rating of 150 bar. It receives flow rate of  $0.0015 \text{ m}^3/\text{s}$  from a pump. Find the (i) Motor speed (ii) Theoretical torque and (iii) Theoretical power. (04 Marks)
- 4 a. What is hydraulic actuator? Explain Telescopic cylinder and cushioning cylinder with the help of neat sketch. (08 Marks)  
b. Explain the following :  
(i) Pump selection factor. (08 Marks)  
(ii) Application of accumulators. (08 Marks)
- 5 a. Explain the construction and working of compound relief valve with a neat sketch. Give the symbolic representation of relief valve. (08 Marks)  
b. Explain the following with neat circuits:  
(i) Sequencing circuit. (08 Marks)  
(ii) Force multiplication. (08 Marks)
- 6 a. Explain the pressure compensated flow control valve with neat sketch. (05 Marks)  
b. What is synchronization of cylinders? Explain how synchronization of cylinders is achieved using matched pump and by using flow control valves with neat circuits. (11 Marks)
- 7 a. With the help of a block diagram, explain the pneumatic system. Also mention the advantages. (08 Marks)  
b. Write a note on FRL unit. (04 Marks)  
c. Explain the impact cylinder with a neat sketch. (04 Marks)
- 8 a. Explain the following :  
(i) Quick exhaust valve. (12 Marks)  
(ii) Time delay valve. (04 Marks)  
(iii) Twin pressure valve.  
b. Write a note on characteristics of compressed air. (04 Marks)

- 9 a. Discuss the supply air throttling and exhaust air throttling types of speed control of cylinders. (10 Marks)  
b. Explain the use of relay and contactors. (06 Marks)
- 10 a. Discuss the motion diagram and control diagram types of functional diagram. (12 Marks)  
b. Write a note on use of logic gates. (04 Marks)

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