

26.4

Reg. No.

Question Paper Code

11817

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2023

Sixth Semester

Mechanical Engineering**ME8694 - HYDRAULICS AND PNEUMATICS**

(Regulations 2017)

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

- | | <i>Marks,
K-Level, CO</i> |
|---|-------------------------------|
| 1. What are the primary functions of hydraulic fluids? | 2,K1,CO1 |
| 2. State the reason why positive displacement pumps found suitable for fluid power application. | 2,K1,CO2 |
| 3. List few applications of semi rotary actuators. | 2,K1,CO2 |
| 4. Draw the ANSI symbol for 'pilot – operated check valve'. | 2,K1,CO3 |
| 5. Differentiate meter in and meter out control. | 2,K1,CO3 |
| 6. What is the purpose of synchronized hydraulic circuits and how is it attained? | 2,K1,CO4 |
| 7. When is pneumatics preferred over hydraulics? | 2,K1,CO4 |
| 8. Why are quick exhaust valves required? | 2,K2,CO5 |
| 9. State any four common causes for hydraulic system breakdown. | 2,K1,CO5 |
| 10. What are the important components of a pneumatic power pack? | 2,K1,CO1 |

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11. a) Describe the general types of fluids used for fluid power system and its properties. 13,K2,CO1
- OR**
- b) Explain in detail all the desirable properties of a good hydraulic fluid. 13,K2,CO1
12. a) With a neat sketch, explain the construction and working principle of an external gear pump. 13,K2,CO2
- OR**
- b) Explain with neat diagram the construction and working of an unbalanced vane pump. 13,K2,CO2

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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13. a) Explain using a neat sketch "end cushioning" provide in hydraulic cylinders. Also sketch at least four types of cylinder mounts available. *13.K2.CO3*

OR

- b) Discuss the functioning of an unloading valve with a diagram. *13.K2.CO3*

14. a) Design an Electro-Pneumatic Circuit to obtain automatic sequencing with ladder diagram using limit switch/ pressure switch. *13.K3.CO4*

OR

- b) Draw the block diagram of a PLC and explain the working of major elements. Also, give their applications in low cost automation. *13.K3.CO4*

15. a) List out any four operational problems associated with pumps and valves and possible causes and suitable remedy for each problem. *13.K3.CO5*

OR

- b) Draw and explain a hydraulic circuit to actuate a shaping machine ram. Incorporate the following features in the circuit. (i) Rapid tool approach. (ii) Slow cutting operation and (iii) Rapid tool retraction/return. *13.K3.CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Design a closed hydrostatic transmission circuit and explain the functions of the components in it. Also explain the function of replenishing circuit. *15.K3.CO6*

OR

- b) Three pneumatic cylinders A, B, C are used in automatic sequence of operation. A cylinder extends, C cylinder retracts, B cylinder retracts, and then A cylinder retracts, C cylinders extends and B cylinder extends. Develop pneumatic circuits by cascade method. *15.K3.CO6*