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**Fifth Semester B.E. Degree Examination, Dec.2023/Jan.2024**  
**Hydraulics and Pneumatics**

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

**Module-1**

- 1 a. State Pascal law and explain structure of a hydraulic control system with sketch. (10 Marks)  
 b. Explain the construction and working of external gear type pump. (10 Marks)

**OR**

- 2 a. Discuss the construction and working of vane type motor. (10 Marks)  
 b. Describe the construction and working of radial piston pump. (10 Marks)

**Module-2**

- 3 a. With a neat sketch, explain pilot operated direction control valve. (10 Marks)  
 b. With a neat sketch, explain working of pressure sequence valve. (10 Marks)

**OR**

- 4 a. Explain any five properties of a good hydraulic fluid. (10 Marks)  
 b. Mention the types of hydraulic fluids. Explain any two hydraulic fluids. (10 Marks)

**Module-3**

- 5 a. Explain with neat circuit diagram the working of double pump hydraulic system used in any one type of application. (10 Marks)  
 b. Explain briefly the working of double acting cylinder. (10 Marks)

**OR**

- 6 a. Discuss the speed control of hydraulic cylinder using meter in circuit. (10 Marks)  
 b. Describe accumulator as emergency power source. (10 Marks)

**Module-4**

- 7 a. Discuss the characteristics of compressed air. (10 Marks)  
 b. Describe the filter and lubricators used in a pneumatic system with relevant figure. (10 Marks)

**OR**

- 8 a. With a neat sketch, explain quick exhaust valve. (10 Marks)  
 b. Sketch and explain a Rod-less cylinder. (10 Marks)

**Module-5**

- 9 a. Explain cascade method of pneumatic circuit design. (10 Marks)  
 b. With relevant line diagram, explain motion and control diagram. (10 Marks)

**OR**

- 10 a. With a neat sketch, write a note on: i) Solenoid ii) Limit switches. (10 Marks)  
 b. Explain briefly the use of relay and contactors. (10 Marks)