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**Seventh Semester B.E. Degree Examination, Dec.2016/Jan.2017**  
**Hydraulics and Pneumatics**

Max. Marks:100

Time: 3 hrs.

**Note:** Answer any FIVE full questions, selecting atleast TWO questions from each part.

**PART - A**

- 1 a. State Pascal's law. Explain its applications, with a neat sketch. (04 Marks)  
 b. Explain the working of unbalanced vane pump. Also obtain an expression for its theoretical discharge. (10 Marks)  
 c. A pump having a displacement of  $25\text{cm}^3$ , operates with a pressure of 250 bar and speed of 1390 rpm. Volumetric efficiency of 0.85 and mechanical efficiency of 0.80. Calculate  
 i) Pump delivery in LPM    ii) Input power at pump shaft in KW    iii) Drive Torque at pump shaft. (06 Marks)
  - 2 a. With neat sketches, explain First, Second and Third class lever system. (06 Marks)  
 b. An 8 cm diameter hydraulic cylinder has 4cm diameter rod. If the cylinder receives the flow at 100 LPM and 12MPa. Find i) Extension and Retraction speeds    ii) Extension and Retraction load carrying capacities. (04 Marks)  
 c. Explain with a neat sketch : i) Balanced vane motor    ii) Swash plate piston motor. (10 Marks)
  - 3 a. Explain the working principle of pilot operated check valve with a neat sketch. Illustrate the graphical symbol of the valve (10 Marks)  
 b. Explain with the aid of sketches :  
 i) Non - compensated flow control valve    ii) Compensated flow control valve. (10 Marks)
  - 4 a. Explain the following : i) Meter In and Meter Out circuit    ii) Classification of accumulator and explain any 2 types. (10 Marks)  
 b. With a neat sketch, explain Hydraulic circuit for sequencing of Two cylinders. (10 Marks)
- PART - B**
- 5 a. How are hydraulic seals classified? Explain positive and non positive seals. (06 Marks)  
 b. With the aid of sketches, explain the following : i) Return line filtering    ii) Suction line filtering    iii) Pressure line filtering. (06 Marks)  
 c. Sketch and explain the "Reservoir System". (08 Marks)
  - 6 a. Differentiate between Hydraulic and Pneumatic systems. (05 Marks)  
 b. Sketch and explain the cushion assembly for a pneumatic cylinder. (07 Marks)  
 c. Write short notes on : i) Cylinder mounting arrangement    ii) Rod less cylinder. (08 Marks)
  - 7 a. Explain with a suitable circuit diagram :  
 i) Shuttle valve    ii) Quick exhaust valve. (10 Marks)  
 b. Briefly explain the following : i) OR gate    ii) AND gate. (10 Marks)
  - 8 Write short notes on :  
 a. Solenoids.  
 b. Air Driers.  
 c. Air filters.  
 d. Motion Diagrams. (20 Marks)

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