

Code: 17D04105

M.Tech I Semester Regular &amp; Supplementary Examinations January/February 2019

**DESIGN OF HYDRULIC & PNEUMATIC SYSTEMS**

(Common to MD &amp; CAD/CAM)

(For students admitted in 2017 &amp; 2018 only)

Time: 3 hours

Max. Marks: 60

Answer all the questions

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- 1 (a) What is a semi-rotary actuator? Explain any one with neat sketch.  
(b) Explain open loop and closed loop circuit.

**OR**

- 2 Explain detail about selection, specification and characteristics of hydraulic pump.

- 3 (a) With a sketch, explain the working of a 4/3 closed centre DCV.  
(b) Sketch a fixed flow pressure compensated flow control valve and explain its working.

**OR**

- 4 Explain the function and working principle of pressure reducing valve and sequence valves.

- 5 Draw a neat sketch and explain the function of following:

- (a) Synchronizing with flow control valves.  
(b) Synchronizing with matching pumps.

**OR**

- 6 Construct a hydraulic circuit for earth mover and explain its working principle.

- 7 Develop a circuit for the sequence A1B1B0A0 using step counter method for single cycle operation and explain the working.

**OR**

- 8 Consider an automatic drilling machine. The complete cycle is as follows:  
Cylinder A extends to clamp the work piece, then cylinder B extends to drill a hole and then retracts. Cylinder A then retracts to unclamp the work piece. Design a control circuit applying the K-V mapping method. The circuit is provided with a start valve to avoid continuous cycling.

- 9 (a) Write a note on application of hydraulic/pneumatic systems for robotic control.  
(b) State the common faults in a hydraulic system.

**OR**

- 10 (a) With a block diagram, explain the functions of PLC.  
(b) Sketch a PLC based circuit for the extension and retraction of a cylinder and explain.

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