

Code No: 157BQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, February/March - 2022

**FLUID POWER SYSTEMS****(Mechanical Engineering)****Time: 3 Hours****Max. Marks: 75****Answer any five questions****All questions carry equal marks**

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- 1.a) State the Pascal's law and discuss applications in fluid power systems. What are the different energy losses to be considered for the design?
- b) Explain various components used in hydraulic systems along with their symbols of representation in the circuit diagram. [7+8]
- 2.a) Describe the various functions of hydraulic fluids and discuss their desirable characteristics.
- b) What are the various applications of fluid power systems? Explain them with different control circuits. [7+8]
- 3.a) List various types of control valves used in hydraulic system and explain their functions along with their applications.
- b) What are different forces acting in longitudinal and lateral directions of spool valve? Discuss them. [7+8]
- 4.a) Describe the flapper valve function along with its design procedure and analyse different forces.
- b) To make pressure compensation, the valves are arranged either in series or parallel. Discuss the importance of above arrangements for flow control. [7+8]
- 5.a) Explain the working of hydraulic regenerative circuit with a neat sketch and discuss its major limitations.
- b) What do you understand by the synchronization of control circuits? Explain with a suitable example. [7+8]
- 6.a) Classify various types of accumulators used for the control circuits and discuss their applications.
- b) Explain the construction and working principle of bladder type of accumulator with a neat diagram. [8+7]
- 7.a) What are the advantages, disadvantages and applications of pneumatic systems used for different control circuits? Explain.
- b) Explain the valve arrangements for operation of logic controls of pneumatic systems and discuss the importance. [7+8]
- 8.a) Describe the working of program control unit and electro-pneumatic control unit and compare them.
- b) Draw the pneumatic control circuit for the operation of assembly of different components in a assembly system. [8+7]