

**Model Question Paper**  
**Sixth Semester B.Tech Mechanical Engineering**  
**ME 010 606 L 05: Industrial Hydraulics**

Duration: 3 Hours

Maximum marks: 100

**Part A**

**Answer *all* questions.**

**Each question carries 3 marks.**

- 1) Differentiate a positive displacement pump from a non positive displacement pump.
- 2) Explain the working of a screw pump with appropriate sketches.
- 3) Draw the JIC symbol of a check valve and explain its working.
- 4) What do you understand by a flow divider?
- 5) With a neat sketch explain the working principle of hydraulic ram.

(5 x 3 = 15 Marks)

**Part B**

**Answer *all* questions.**

**Each question carries 5 marks.**

- 6) With a neat sketch explain the working of an air filter cum water separator.
- 7) Explain the working of a bent axis pump with appropriate sketches.
- 8) Discuss the importance of a pressure relief valves in hydraulic circuits.
- 9) What are the basic elements present in any hydraulic circuits?
- 10) Discuss any 5 desirable properties of hydraulic fluids.

(5 x 5 = 25 Marks)

**Part C**

**Answer *all* questions.**

**Each question carries 12 marks.**

- 11) With appropriate sketches discuss the various accumulators used in hydraulic circuits.

**OR**

- 12) Draw JIC symbols for;

- a) Gas charged bladder type accumulator,
- b) Single acting cylinder with adjustable cushion,
- c) Pressurized reservoir with return line below the fluid level
- d) Bi-directional variable displacement pump with electric motor,
- e) 2 way flow control valve with orifice,
- f) 2 position, 3 port normally open valve.

- 13) a) Discuss the constructional differences between a balanced vane pump and an unbalanced vane pump with appropriate sketches.  
b) With neat sketches discuss about internal and external gear motors.

**OR**

- 14) a) With neat sketches explain the working of single and double acting pumps.  
b) Explain the working of a radial piston pump.

- 15) a) Explain with a neat sketch the working a gate valve.  
b) With an appropriate example explain the use of shuttle valve.

**OR**

- 16) a) Explain the working of a solenoid actuated spool valve with an example.  
b) What do you understand by 3 position, 4 port , tandem centered valve?

- 17) With neat sketches discuss the concept of metering in and metering out.

**OR**

- 18) With an appropriate example illustrate the application of pressure sequence valves.

- 19) Design an appropriate circuit for a hydraulic shaper.

**OR**

- 20) With appropriate sketches explain the working of power steering.

(5 x 12 = 60 Marks)