

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-IV • EXAMINATION – WINTER • 2014

Subject Code: 142302**Date: 29-12-2014****Subject Name: Plastic Industrial Hydraulics and Pneumatics****Time: 02:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 (a) Define Pascal's law. In the hydraulic jack a force of 100N is exerted on the small piston. Determine the upward force on the large piston. The area of the small piston is 50cm^2 and the area of the large piston is 500cm^2 . **07**

(b) What is the difference between Oxidation and Corrosion? Describe Oxidation and Corrosion of Hydraulic fluids? **07**

Q.2 (a) Write a short note on filters and strainers used in hydraulic systems. **07**

(b) Why pressure compensated vane pump used? Explain about its working with the help of sketch. **07**

OR

(b) A gear pump has 80mm outside diameter, 55mm inside diameter and 25mm width. If the actual pump flow rate is 1800 rpm and rated pressure $0.00183\text{m}^3/\text{s}$. What is the volumetric efficiency? **07**

Q.3 (a) What are the different flow control methods? Explain about any one with the help of suitable circuit diagram. **07**

(b) What is the function of a direction control valve? Explain about four way direction control valve with the help of a sketch and mention its graphic symbol. **07**

OR

Q.3 (a) What is the purpose of a Counter balance valve? Explain about its application with the help of sketch. **07**

(b) Name four criteria by which the size of a reservoir is determined? What are the three most common reservoir designs? Explain about any one. **07**

Q.4 (a) What is Pressure intensifier and mention its application. Describe four applications of accumulators. **07**

(b) What is Servo valve? Explain about Electro-hydraulic servo valves. **07**

OR

Q.4 (a) What are the applications of hydraulic valves in moulding machines? **07**

Q.4 (b) Draw the clamp control circuit of an injection moulding machine. **07**

Q.5 (a) What is the working principle of FRL unit? How FRL unit will be constructed mention its application. **07**

(b) How to select pneumatic tubes and pipes in a pneumatic circuit? What are applications of pneumatics in plastic processing equipments? **07**

OR

Q.5 (a) Draw the symbols for the following Hydraulic elements **07**

1. Hydraulic line, 2. Pneumatic line, 3. Pump, Fixed displacement
 4. Cylinder Double end rod, 5. Intensifier, 6. Accumulator
 Spring loaded, 7. Pressure-reducing valve.

(b) 1. Hydraulic cylinders are linear actuators (True/False). **07**

2. Check valve is a _____ directional valve.

3. Piston pumps are _____ displacement pumps.

4. Symbol for Check valve _____

5. Symbol for Motor, Rotary fixed displacement _____

6. Symbol for Pressure Gauge _____

7. Shuttle valve is a type of _____ control valve.