

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE SEMESTER-IV EXAMINATION – SUMMER 2015**

**Subject Code: 142302****Date: 01/06/2015****Subject Name: Plastic Industrial Hydraulics and Pneumatics****Time: 10.30am-01.00pm****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) State Pascal's Law. In the hydraulic jack, a force of 100N is exerted on the small piston. The area of small piston is  $50\text{cm}^2$ , and the area of large piston is  $500\text{cm}^2$ . Determine the upward force on the large piston. **07**
- (b) What is the purpose of a heat exchanger? Name the important factors to consider when selecting a heat exchanger. **07**
- Q.2** (a) What is a positive displacement pump? Explain about working of a external gear pump with the help of a sketch. **07**
- (b) Draw the symbols for the following hydraulic elements: **07**
- i) Variable displacement pump, ii) Cylinder double acting, iii) Check valve, iv) Filter, v) Intensifier, vi) Electrical Motor, vii) Pressure reducing valve.
- OR**
- (b) A gear pump has a 80mm outside diameter, a 55mm inside diameter, and a 25mm width. If the actual pump flow rate at 1800 rpm and rated pressure is  $0.00183\text{m}^3/\text{s}$ , what is the volumetric efficiency? **07**
- Q.3** (a) What is the purpose of a directional control valve? Explain about the construction and operation of check valve. **07**
- (b) Explain about any one flow control method with the help of a circuit diagram. **07**
- OR**
- Q.3** (a) Describe the operation of compound pressure relief valve. **07**
- (b) Explain the working of a four way direction control valve. **07**
- Q.4** (a) Define accumulator. What are the types of accumulators? How the spring loaded accumulator works? **07**
- (b) What is the purpose of sealing devices? What are the common types of seals? Explain the function of each type. **07**
- OR**
- Q.4** (a) Define i) Displacement of a pump, ii) Rating of a Pump, iii) volumetric efficiency of a pump. **07**
- (b) What is unloading valve? How unloading valve works? **07**
- Q.5** (a) What is a servo valve? What are the types of servo valves? Explain about any one. **07**
- (b) What is a compressor? What is the working principle of a compressor? Explain about working of a piston compressor. **07**
- OR**
- Q.5** (a) What is the working principle of FRL unit? What are the applications of FRL unit? **07**
- (b) Describe the working of an axial piston motor bent axis design. **07**

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