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## GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-IV • EXAMINATION - WINTER • 2014

Subject Code: 142302 Date: 29-12-2014 **Subject Name: Plastic Industrial Hydraulics and Pneumatics Total Marks: 70** Time: 02:30 pm - 05:00 pm **Instructions:** 1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. (a) Define Pascal's law. In the hydraulic jack a force of 100N is exerted on 07 the small piston. Determine the upward force on the large piston. The area of the small piston is  $50 \text{cm}^2$  and the area of the large piston is 500cm<sup>2</sup>. (b) What is the difference between Oxidation and Corrosion? Describe 07 Oxidation and Corrosion of Hydraulic fluids? 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. (b) A gear pump has 80mm outside diameter, 55mm inside diameter and 07 25mm width. If the actual pump flow rate is 1800 rpm and rated pressure 0.00183m<sup>3</sup>/s. What is the volumetric efficiency? Q.3 What are the different flow control methods? Explain about any one 07 with the help of suitable circuit diagram. What is the function of a direction control valve? Explain about four 07 way direction control valve with the help of a sketch and mention its graphic symbol. OR (a) What is the purpose of a Counter balance valve? Explain about its 07 Q.3 application with the help of sketch. (b) Name four criteria by which the size of a reservoir is determined? What 07 are the three most common reservoir designs? Explain about any one. What is Pressure intensifier and mention its application. Describe four 07 0.4 applications of accumulators. What is Servo valve? Explain about Electro-hydraulic servo valves. (b) 07 What are the applications of hydraulic valves in moulding machines? 0.4 07 Draw the clamp control circuit of an injection moulding machine. Q.4 07 What is the working principle of FRL unit? How FRL unit will be 07 Q.5 constructed mention its application. (b) How to select pneumatic tubes and pipes in a pneumatic circuit? What 07 are applications of pneumatics in plastic processing equipments? OR (a) Draw the symbols for the following Hydraulic elements Q.5 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.

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