

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VIII • EXAMINATION – SUMMER 2013

Subject Code: 180204**Date: 09/05/2013****Subject Name: Automotive Hydraulics and Pneumatics****Time: 10:30 am TO 01:00 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) (i) State the basic advantages of hydraulic system over mechanical system. **07**
(ii) What precautions are to be taken to save oil from contamination?
- (b) (i) Through a hydraulic pipe of 15 mm diameter flow oil at a flow rate of 12 litre/min. Find out the flow velocity. **07**
(ii) Calculate the hydrostatic pressure at the bottom of a hydraulic oil container filled with oil ($\rho = 0.8 \text{ Kg/cm}^3$) up to a height of 800 mm.
- Q.2** (a) Draw and explain constructional features of a 5/3-direction control valve of linear type along with its graphical symbol. **07**
(b) Give Hydraulic/Pneumatic Symbol for following: **07**
1. Double acting cylinder
 2. 3/2 directional control valve normally closed
 3. Pressure relief valve
 4. Non return valve
 5. Pressure regulator
 6. Quick Exhaust valve
 7. Pressure regulator
- OR**
- (b) What types of fluids are available for hydraulic system? Explain two of them. **07**
- Q.3** (a) Explain the construction and operation of a two stage electro hydraulic servo valve. **07**
(b) Explain the working principle of screw compressor and state its advantages over reciprocating compressor. **07**
- OR**
- Q.3** (a) Explain the working principle of external gear pump and determine its performance measures. **07**
(b) Explain the operation of a check valve with a neat sketch. **07**
- Q.4** (a) With neat sketch explain the operations of a pressure-reducing valve. Sketch its graphical symbol. **07**
(b) With a neat sketch explain the construction and operation of pilot operated sequence valve. **07**
- OR**
- Q.4** (a) Draw a hydraulic circuit diagram of a pneumatic system having a double acting cylinder which has a rapid approach speed, then a slow feed motion and at the end of stroke the cylinder returns rapidly. **07**
(b) Explain the various mechanics of hydraulic mounting. **07**
- Q.5** (a) Explain different pneumatic sensors used in machine tool. **07**
(b) Enlist the various faults, probable causes and also their remedial action for the following pneumatic system components **07**
1. Compressor
 2. Air cylinder
 3. FRL unit
 4. Pipe line
- OR**
- Q.5** (a) Describe hydro-pneumatic air suspension with neat diagram. **07**
(b) Explain following fluidic gate **07**
- (a) FLIP ó FLOP
 - (b) NOR Gate
