

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII(NEW) EXAMINATION – SUMMER 2019****Subject Code:2171912****Date:14/05/2019****Subject Name:Oil Hydraulics & Pneumatics****Time:02:30 PM TO 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) State the Pascal's law. Explain the principle of Bramah's press principle. **03**
 (b) Draw the circuit of a simple hydraulic system, in standard symbols, and explain briefly the function of its basic elements. **04**
 (c) Classify the pumps used for the hydraulic system and explain external and internal gear pump with neat sketches. **07**
- Q.2** (a) Distinguish between Hydraulic system & Pneumatic system. **03**
 (b) What is the influence of following properties of hydraulic fluid on hydraulic systems? **04**
 (i) Bulk Modulus
 (ii) Demulsibility
 (iii) Foaming tendency
 (iv) Volatility
 (c) What is the purpose of the filter in a hydraulic system? Where is it located in hydraulic circuit? **07**
- OR**
- Q.3** (c) Write a short note on fire resistant and bio-degradable oils. **07**
 (a) State salient functions of oil reservoir. Draw hydraulic symbol of a power pack. **03**
 (b) State different types of Accumulator. Explain one in detail. **04**
 (c) What is Hydrostatic transmission? Explain the change in torque, power and speed by hydraulic motor with different combination of motor and pump. Give its applications. **07**
- OR**
- Q.3** (a) How does a pressure relief valve differ from a pressure reducing valve? **03**
 (b) What is pressure compensated flow control valve? How does pressure compensation take place? **04**
 (c) State and explain four main center conditions of 4/3 spool type direction control valve. Draw hydraulic symbols of each position for 4/3 solenoid operated spring centered direction control valve. **07**
- Q.4** (a) Give difference between Meter-in and Meter-out circuit. **03**
 (b) Draw a schematic of a swash plate axial piston pump. Explain briefly its working and construction. **04**
 (c) Explain the difference between regenerative and sequence control circuit for hydraulic control with neat sketch and suitable example. **07**
- OR**
- Q.4** (a) What are different sources of heat generation and what is the effect of heat generated in hydraulic system. **03**
 (b) Discuss the role of automation in pneumatic and hydraulic control systems. **04**
 (c) Explain construction and operation of shuttle valve and twin pressure valve. Illustrate their application through a typical pneumatic circuit. **07**
- Q.5** (a) Write a short note on the Quick Exhaust valve. **03**

- (b) Draw the detailed symbol of FRL unit. Explain any two component of the same in detail **04**
- (c) Explain construction and operation of time delay valve. Illustrate its application in setting delay in closing time through a typical pneumatic circuit. **07**

OR

- Q.5**
- (a) Explain ‘cushioning’ of pneumatic cylinder. **03**
 - (b) Explain cascade system for circuit design using assumed sequence. **04**
 - (c) In a press stamping operation to be performed using a stamping machine. Before stamping, work-piece has to be clamped under stamping station. Then stamping tool comes and performs stamping operation. Work-piece must be unclamped only after stamping operation. **07**
