

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER- VI EXAMINATION – SUMMER 2026

Subject Code:3164106

Date:29-05-2026

Subject Name: 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.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Define the pascal's law statement. **03**
(b) Write the application of fluid power system. **04**
(c) Discuss the necessity of fluid power engineering in recent time. **07**
- Q.2** (a) Enlist the various hydraulic actuators. **03**
(b) Explain the hydraulic cushioning in piston cylinder arrangement. **04**
(c) Differentiate between the hydraulic, pneumatic and electric drive. **07**
- OR**
- Q.3** (b) Explain the Hydraulic system (including all components) with neat sketch. **07**
(a) Draw the ANSI symbol of FRL unit. **03**
(b) What is importance of intercooler in multistage compressor? **04**
(c) Write the function of pressure reducing valve in hydraulic system and explain with neat sketch. **07**
- Q.3** (a) Draw the ISO/ANSI symbol of 2/2 DCV, 4/2 DCV and 5/2 DCV **03**
(b) Define Positive displacement pump and write limitation of it. **04**
(c) Write the function of FCV with reverse free flow in hydraulic system and explain with neat sketch. **07**
- Q.4** (a) Enlist six the desirable hydraulic fluid (oil) properties in hydraulic system. **03**
(b) Classify the directional control valve according to the actuation method. **04**
(c) Explain the quick exhaust valves with neat sketch. **07**
- Q.4** (a) Classify the hydraulic pump. **03**
(b) Write the limitation of 4/2 DCV. **04**
(c) Explain the time delay valve with neat sketch. **07**
- Q.5** (a) Write the properties of air which is being used in pneumatic system. **03**
(b) Discuss the importance of memory valve in fluid power system. **04**
(c) Draw the pneumatic circuit of single acting cylinder controlled through 3/2 DCV direct operated with spring return with power source and FRL unit. **07**
- Q.5** (a) Write the logic function to operate twin pressure valve. **03**
(b) Write the advantages and limitation of diaphragm type compressor. **04**
(c) Consider a simple operation where a double-acting cylinder is used to transfer parts from a magazine. The cylinder is to be advanced either by operating a push button or by a foot pedal. Once the cylinder is fully advanced, it is to be retracted to its initial position. A 3/2-way roller lever valve is to be used to detect the full extension of the cylinder. Design a pneumatic circuit for the above-mentioned application. **07**
