

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2024

Subject Code:3151913

Date:25-11-2024

Subject Name: Oil 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.

| | | Marks |
|------------|---|-----------|
| Q.1 | (a) List the electrical device used in the control of fluid power system. | 03 |
| | (b) Write a short note on air receiver. | 04 |
| | (c) Draw ISO/ANSI symbols | 07 |
| | 1) Uni-directional fixed displacement air compressor | |
| | 2) Bi-directional variable displacement hydraulic pump | |
| | 3) Spring return type single acting cylinder | |
| | 4) Pressure reducing valve | |
| | 5) Variable restriction flow control valve | |
| | 6) Dead weight accumulator | |
| | 7) Air dryer | |
| Q.2 | (a) Define the following terms related to filtration: | 03 |
| | 1) Mesh number | |
| | 2) Silt index | |
| | 3) Beta ratio | |
| | (b) What are different sources of heat generation and what is the effect of heat generated in hydraulic system. | 04 |
| | (c) Explain construction and working of bypass filter with schematic diagram. Also state its advantage and disadvantages. | 07 |
| | OR | |
| | (c) Draw the detailed symbol of FRL unit. Explain any two components of the same in detail. | 07 |
| Q.3 | (a) Classify flow control valves. | 03 |
| | (b) Write a short note on limited rotation air motors. | 04 |
| | (c) Differentiate between a hydrostatic and hydrodynamics system. | 07 |
| | OR | |
| Q.3 | (a) Write a short note on quick exhaust valve. | 03 |
| | (b) Classify actuators based on various criteria. | 04 |
| | (c) State the different ways of control of DCV. | 07 |
| Q.4 | (a) How compressed air is generated in pneumatic system. | 03 |
| | (b) Explain construction and working of telescopic cylinder. | 04 |
| | (c) Explain construction and working of pressure compensated flow control valve. | 07 |

OR

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|------------|---|-----------|
| Q.4 | (a) State advantages and limitations of bleed-off circuit. | 03 |
| | (b) Draw basic pneumatic circuit for operating single acting cylinder using 3/2 DCV. | 04 |
| | (c) Sketch and explain hydraulic circuit for operating bi-directional motor using 4/3 DCV. | 07 |

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|------------|--|-----------|
| Q.5 | (a) Explain the principle of regenerative circuit. | 03 |
| | (b) Sketch hydraulic circuit for operating DAC using 4/2 DCV. | 04 |
| | (c) Sketch and explain pneumatic circuit for operating two SAC using one 4/2 DCV. | 07 |

OR

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|------------|---|-----------|
| Q.5 | (a) What are different circuit design softwares available in the market? Explain anyone in detail. | 03 |
| | (b) Write different steps of to be carried out for circuit simulation in the software. | 04 |
| | (c) Write a short note on programmable automation. | 07 |
