

Register No.: ..... Name: .....

**SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)**

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

**FIRST SEMESTER M. TECH DEGREE EXAMINATION (Regular), FEBRUARY 2022****ROBOTICS AND AUTOMATION****(2021 Scheme)****Course Code : 21RA103****Course Name: Fluid Power Automation****Max. Marks : 60****Duration: 3 Hours****PART A***(Answer all questions. Each question carries 3 marks)*

1. Discuss in detail the future of the fluid power industry in India.
2. List the applications of Hydraulic Power Packs.
3. Draw and explain the constructional details of a Spool valve.
4. Explain the different types of Electro-Hydraulic Servo Valves.
5. Design an AND and NAND gate using DCV's.
6. Explain the details of Meter-Out Circuits with neat sketches.
7. Explain the working of UP- Counter and DOWN- Counter in PLC Ladder Programming.
8. Write a short note on PLC programming languages.

**PART B***(Answer one full question from each module, each question carries 6 marks)***MODULE I**

9. Compare Hydraulic pumps and Hydraulic motors with the help of neat sketches. (6)

**OR**

10. Explain the stages of operation of Lobe Pumps with neat sketches. (6)

**MODULE II**

11. a) Illustrate the working of a Spring-Return Single-Acting Cylinder with the help of a diagram. (4)  
b) Compare the graphical symbols of different linear actuators. (2)

**OR**

12. Explain the function of Cushioning in Cylinders and why it is important in Hydraulic Cylinders? (6)

**MODULE III**

13. How a counter balance valve works? Explain the operational details with neat diagram. (6)

**OR**

14. Draw the hydraulic circuit for controlling a double acting cylinder and explain the details of operation. (6)

**MODULE IV**

15. Explain the characteristics and performance of electro hydraulic servo valves. (6)

**OR**

16. List the different methods for shifting servo valve tool. Explain with neat schematics. (6)

**MODULE V**

17. Design a hydraulic sequence circuit for the sequence A+B+B-A- using K-V Map method. (6)

**OR**

18. Design a hydraulic sequence circuit for A+B+A-B- sequence using cascade method. (6)

**MODULE VI**

19. a) Draw and explain the architecture of a PLC with a neat block diagram. (4)  
b) How PLC got more attention than Relay logic in industries? (2)

**OR**

20. Two double acting cylinders, A and B are used to perform an operation in the bottle filling unit. The operation is started by the push button switch SW1 and stopped by SW2. Draw the hydraulic circuit, PLC wiring diagram and PLC ladder logic to implement A+B+A-B- task. (6)

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