

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

**SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)**

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

**FIFTH SEMESTER B.TECH DEGREE EXAMINATION (R), DECEMBER 2023****MECHANICAL ENGINEERING****(2020 SCHEME)****Course Code : 20MET395****Course Name: Fluid Power Automation****Max. Marks : 100****Duration: 3 Hours****PART A*****(Answer all questions. Each question carries 3 marks)***

1. Why hydraulic power is essential to perform heavy duty works?
2. List the names of six basic components required in a hydraulic circuit.
3. What are the uses of pneumatic systems?
4. What is positive displacement pump?
5. Enumerate any two applications of single acting pneumatic cylinders
6. Explain the significance of directional control valve.
7. Describe the function of a Karnaugh map.
8. What are the benefits of electrical control of hydraulic systems?
9. List the main components of PLC
10. What is timer in PLCs?

**PART B*****(Answer one full question from each module, each question carries 14 marks)*****MODULE I**

11. a) What are prime movers? Explain with an example. (7)
- b) Why air cannot be used for all fluid power applications? (7)

**OR**

12. a) How is pressure developed in a hydraulic system? (7)
- b) Explain the working of a piston pump (7)

**MODULE II**

13. a) What is cylinder cushion? Explain its significance. (7)
- b) How rotary movements are generated by fluid power? (7)

**OR**

14. a) Explain the working of an accumulator. Why it is use? (7)
- b) With neat figure explain the construction of a double acting cylinder. (7)

**MODULE III**

15. a) How does a pilot check valve differ from a simple check valve? (7)  
b) What is a four-way, spring-centered, three-position valve? (7)

**OR**

16. a) Write short notes on solenoid. List any two applications. (7)  
b) Explain the significance of a pressure relief valve. (7)

**MODULE IV**

17. a) Develop AND, OR and XOR logic gate in ladder programming. (7)  
b) What are shift registers? (7)

**OR**

18. a) Design and draw a hydraulic circuit for hydraulic lift and explain it. (7)  
b) List and describe the fundamental electrical components used in electro pneumatics. (7)

**MODULE V**

19. On a conveyor, cartons with two colours are moved. The larger boxes are recognized by a sensor, and a pneumatic system is employed to move them to a different conveyor for segregation. To complete this task, build a pneumatic circuit with the appropriate sensor and actuators. (14)

**OR**

20. Develop pneumatic circuit and ladder diagram for automated welding machine. (14)

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