

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FOURTH SEMESTER B.TECH DEGREE EXAMINATION (Regular), JULY 2022**(2020 SCHEME)****Course Code: 20RBT282****Course Name: Introduction to Industrial Automation****Max. Marks: 100****Duration: 3 Hours****PART A***(Answer all questions. Each question carries 3 marks)*

1. What is FMS? Mention the types of FMS based on the number of machines in the system.
2. Enumerate the commonly used linear transfer mechanisms in Industrial scenario.
3. Explain the construction of RVDT with suitable sketches.
4. Explain the following sensor specifications with figures.
 - (i) Hysteresis
 - (ii) Non linearity
5. Explain the basic block diagram of a CNC machine.
6. Outline the factors that affect the selection of material handling equipment for a particular application.
7. Realize an AND function using 3/2 DCVs.
8. What are directional control valves? Draw the symbol of spring centered lever actuated 4/3 control valve.
9. Discuss the different inputs and outputs used in PLC.
10. Describe the Latching concept in PLC programming.

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

11. a) Explain the different configurations of an automated flow line systems. (9)
- b) Discuss the features of a continuous production system. (5)

OR

12. a) Explain the block diagram of a manufacturing system. (6)
- b) Explain the classification of an automated assembly system (8)

MODULE II

13. a) Summarize the various working principles of thermo electric position sensors. (6)
- b) Describe the working of a basic pneumatic actuator element with neat diagram. (8)

OR

14. a) Explain the working principle of LVDT with neat figures. (8)
b) Enumerate the applications of eddy current sensors in manufacturing systems. (6)

MODULE III

15. a) Explain the ball screw drive mechanism in linear motion drives. (4)
b) Summarize the five different categories of material transport system (10)

OR

16. a) Summarize the types of storage systems available in industrial scenario. (6)
b) What is AGVs? Explain any two types with neat sketches. (8)

MODULE IV

17. a) Summarize the working principles of any three non return valves. (6)
b) Explain the working principle of ON timer delay relays with neat diagrams. (8)

OR

18. a) Explain the general layout a hydraulic system. (5)
b) Design A+ B+ B- A- cylinder sequence using step counter method. (9)

MODULE V

19. a) Describe the architecture of PLC using a neat block diagram (8)
b) Explain the scanning laser optical measurement system. (6)

OR

20. a) Realize the Ladder diagram for a half adder circuit. (6)
b) Summarize the role of CMM in automation inspection field. (8)
