

**Roll No.**

**Total No. of Pages : 02**

**Total No. of Questions : 08**

**M.Tech. (Mechanical Engineering) (Manufacturing Engineering & Automation) (Sem.-3)**

## INDUSTRIAL AUTOMATION

**Subject Code : MTME-301**

**M.Code : 92831**

**Date of Examination : 24-12-22**

**Time : 3 Hrs.**

**Max. Marks : 100**

**INSTRUCTIONS TO CANDIDATES :**

1. Attempt any FIVE questions out of EIGHT question.
2. Each question carry TWENTY marks.

1.
  - a) Explain in details the different strategies for automation and process improvement.
  - b) Whether automation is beneficial or not? Explain in detail by taking an example of Indian industry.
2.
  - a) Explain with diagram the classification of various manufacturing processes from the perspective of vehicle manufacturing industry.
  - b) Explain in details the different type of Automated guided vehicles (AGV) system.
3.
  - a) Explain in brief the overview of the Automatic identification methods.
  - b) Explain with diagrams the relationship between plant layout and type of production facility available in the manufacturing industry.
4.
  - a) Explain with diagram the typical cellular manufacturing systems.
  - b) Differentiate between the multi-station and single-station assembly machine.
5. Explain in details the supervisory control and data acquisition (SCADA) based architectures in relation to automation in process industries.
6.
  - a) The typical operating cycle of the PLC, called a scan, consists of three parts (i) input scan, (ii) program scan, and (iii) output scan. Briefly describe what is accomplished in each part.
  - b) Explain Programmable logic controller with neat diagram.

7.
  - a) Explain with diagrams the different configurations of Local Control Unit (LCU) architectures.
  - b) Explain in details the various applications of the distributed control system.
8.
  - a) Write a short note on the following communication protocols used in the distributed control system: (i) HART protocol, (ii) Profibus.
  - b) Explain in detail the various elements of Local Control Unit (LCU).

**NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.**