Roll No. | | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 08

M.Tech. (Mechanical Engineering) (Sem.–2)

AUTOMATION & ROBOTICS

Subject Code : MTME-206

M.Code : 74982

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) What is the importance of automation in manufacturing? Discuss the need for flexibility in automated manufacturing systems. (10)

   b) Discuss the types of automation systems used in manufacturing companies. (10)

2. a) Discuss with an example, the principle of operation of a programmable logic controller. (10)

   b) Why automation is good for the economy? Discuss the economies of automation. (10)

3. How will you classify various transfer machines used in the industry? Explain the characteristic features of different types of automatic transfer machines giving neat sketches. (20)

4. a) Discuss the need for using automation in feeding mechanisms. Explain the following types of feeding mechanisms used in industry: bowl feeders, centrifugal feeders, step feeders, linear feeders, carpet feeders and 3 axis vibration feeders. (10)

   b) Explain the steps involved in design single model, multi model and mixed model production lines. (10)

5. a) What do you understand by flexible manufacturing automation? Explain the characteristics features of single station manufacturing cell and group technology systems giving selection criterion of these manufacturing systems. (10)

   b) What is the most popular type of drive for CNC machines today? Why a gearbox is used in the main drive of some CNC machines? (10)

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6. a) What is the significant advantage of using a Robot in a computer integrated manufacturing system? Describe the elements of a robotic system. (10)

   b) What are the different types of control systems used in robots? (10)

7. a) What are the different methods of programming of robots? Discuss the basic types of robot programming languages. (12)

   b) Describe any four types of robots based on geometry and show their work volume. (8)

8. a) Explain the applications of industrial robots for automated material handling applications. (10)

   b) What do you understand by automated guided vehicles used in industries? Explain the working of various types of automated guided vehicles used in industries. (10)

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

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