

B.Tech 6th Semester Exam., 2022

(New Course)

AUTOMATION IN MANUFACTURING

Time : 3 hours

Full Marks : 70

Instructions :

- (i) All questions carry equal marks.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No. 1 is compulsory.

1. Answer any seven of the following questions :

- (a) Define automation.
- (b) Which type of control system is suitable in applications like food industry, petrochemical and industries involving robots?
- (c) Which G-code gives point-to-point movement?
- (d) Name the basic geometric building block provided in a CAD/CAM package.

- (e) How can the speed and position in CNC be controlled?
- (f) What effect does overloading have on fluid power and electrical systems?
- (g) Can we simulate transportation, manufacturing and health system?
- (h) Why are designs periodically modified?
- (i) Which technique is used for solution of nonlinear programming?
- (j) Name any two of the available softwares used in computer-aided design (CAD).

- 2. Why is automation necessary in manufacturing field? Write its advantages and disadvantages.
- 3. What is PLC? Explain the working of PLC.
- 4. Classify CNC machines. Explain which one is suitable for small-scale industries and why.
- 5. Discuss the CIM wheel with neat sketch. Briefly discuss various elements of CIM.
- 6. Explain the concept of flexible manufacturing system.

7. Explain the following commands in geometric modelling :

(a) Scaling

(b) Mirror

(c) Rotation

8. Explain system modelling. Write differences between continuous and discrete event.

9. Write a CNC program using appropriate G and M code to turn component as shown in the figure below. Raw material—MS $\phi 32 \times 50$ mm, cutting speed $V = 40$ m/min and feed = 0.1. Assume suitable data for depth of cut :


