Printed Page:- 03 **Subject Code:- AMTME0201**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech

SEM: II - THEORY EXAMINATION (2022-2023)

Subject: Digital Manufacturing and Automation

Time: 3 Hours **Max. Marks: 70**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* **three Sections -A, B, & C.** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION A **15**

1. Attempt all parts:-

1-a. Control loop unit of M.C.U is always [CO1] 1

(a) a hardware unit

(b) a software unit

(c) a control unit

(d) none of the mentioned

1-b. When referring to CNC programming, which of the following is the command coed to move the tool in the counterclockwise direction? [CO2] 1

(a) G01

(b) G02

(c) G03

(d) G17

1-c. A material's machinability rating is a(n) _____ value given to a particular material's ease with which it is machined. [CO3] 1

(a) Objective

(b) Subjective

(c) Letter

(d) Standardized

1-d. Which among the following is not the functionality of Robots [CO4] 1

(a) Reprogrammability

(b) Multifunctionality

(c) Efficient Performance

(d) Responsibility

1-e. The following cell formation technique is based on Component shape and design? [CO5] 1

(a) Production flow analysis

(b) Component flow analysis

(c) Composite component

(d) Simulation

2. Attempt all parts:-

2.a. Explain the important features of CNC machines. [CO1] 2

2.b. Distinguish between Canned cycle and parametric subroutines. [CO2] 2

2.c. What do you understand by smart manufacturing. [CO3] 2

2.d. What are the three basic modes of material handling operation. [CO4] 2

2.e. Differentiate between the GT and the FMS. [CO5] 2

SECTION B **20**

3. Answer any <u>five</u> of the following:-

3-a. Explain clearly the difference between NC and CNC machine. [CO1] 4

3-b. With help og diagram explain the working of interpolator. [CO1] 4

3-c. Explain with neat sketch, axis designation for CNC turning center and CNC vertical milling machines. [CO2] 4

3-d. What are canned cycles? Discuss how a canned cycle is useful in writing a part program? **[CO2]** 4

3.e. Explain why it is more convenient to use the longest tool as a reference for establishing the Z offsets on a vertical spindle machining center. [CO3] 4

3.f. What are the benefits of industrial robots? [CO4] 4

3.g. Explain different types of machine cells and layouts in GT [CO5] 4

SECTION C **35**

4. Answer any <u>one</u> of the following:-

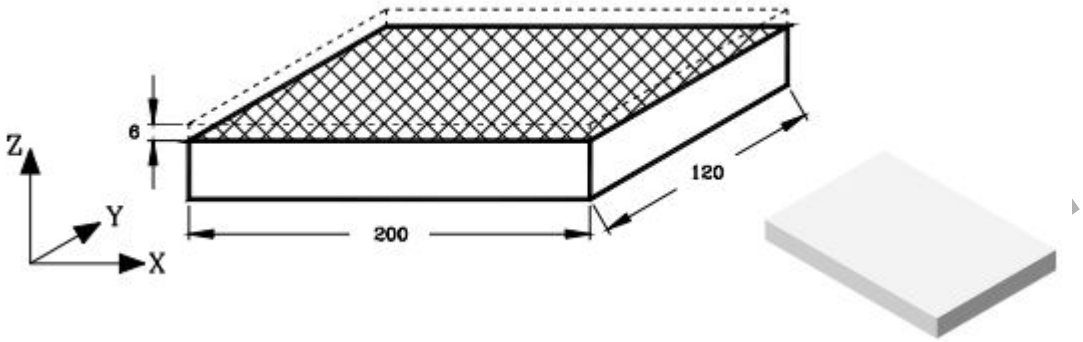
4-a. What is a CNC Post Processor & Explain the structure of Post processor [CO1] 7

4-b. Classify CNC machines tools on the basis of : (i) Types of motion control (ii) According to programming Method.(iii) According to types of controllers. [CO1] 7

5. Answer any <u>one</u> of the following:-

5-a. Explain what instruments are required for the introduction of adaptive control on machines. [CO2] 7

5-b. Write a surface finishing programme for the below figure. Consider the face mill diameter as 10mm. Use sub-programming method. 7



[CO2]

6. Answer any <u>one</u> of the following:-

6-a. Explain different types of cutting-tool materials .Also Write down the properties of cutting tool materials. [CO3] 7

6-b. What are uniqueness required for a work holding devices. [CO3] 7

7. Answer any <u>one</u> of the following:-

7-a. What are the three levels of safety sensor systems in robotics defined by National Bureau of Standards? [CO4] 7

7-b. Which parameters are to be considered for robot specification & selection of robot? Explain in detail. [CO4] 7

8. Answer any <u>one</u> of the following:-

8-a. What are the objectives of CIM? Which major functional areas of the manufacturing enterprise considered for achieving CIM objectives? [CO5] 7

8-b. Explain all the methods of grouping parts into part families. [CO5] 7