

## **2.15 30270 CNC MACHINE**

### **UNIT-1 LITERATURE SURVEY**

- 1.1.1 Introduction
- 1.1.2 Fundamental of numerical control
- 1.1.3 Advantage of NC systems
- 1.1.4 CNC concepts
- 1.1.5 Advantages of CNC

### **UNIT-2 INTRODUCTION TO CNC MACHINES**

- 2.1.1 Introduction
- 2.1.2 Fundamentals of numerical control
- 2.1.3 NC system
- 2.1.4 Classification based on feedback control
- 2.1.5 Feedback devices
- 2.1.6 Classification based on motion control system
- 2.1.7 Classification based on circuit technology
- 2.1.8 NC co-ordinate system
- 2.1.9 Axis identification
- 2.1.10 Procedure for developing manual part program
- 2.1.11 The punched tape in NC
- 2.1.12 Tap coding and format
- 2.1.13 Comparison of ordinary and NC machine tools
- 2.1.14 Methods of improving accuracy
- 2.1.15 Methods of reducing production time

### **UNIT-3 CONSTRUCTION FEATURES OF CNC MACHINE**

- 3.1.1 Introduction
- 3.1.2 Control system design
- 3.1.3 Mechanical system design
- 3.1.4 Drive system
- 3.1.5 Location of transducers
- 3.1.6 Swarf removal

### **UNIT-4 CNC MACHINE OPERATING SYSTEM**

- 4.1.1 Introduction
- 4.1.2 Part programming
- 4.1.3 Method of writing a part program
- 4.1.4 Computer numerical control (CNC)

### **UNIT-5 PROGRAMMABLE LOGIC CONTROLLER (PLC) CHARACTERISTICS**

- 5.1.1 Introduction
- 5.1.2 Procedure for developing manual part program

- 5.1.3 Tape programming format
- 5.1.4 Method of writing a part program

## **UNIT-6 SETTING THE MACHINE**

- 6.1.1 Introduction
- 6.1.2 Part programming point to point machining
- 6.1.3 Part programming point to point machining along straight line
- 6.1.4 Part programming point to point machining along curved surface
- 6.1.5 Part program for lathe operation
- 6.1.6 Part program for milling machine operations
- 6.1.7 Part programming of drilling operation (point to point)

## **UNIT-7 CNC PROGRAMMING**

- 7.1.1 The APT language
- 7.1.2 Geometry statements
- 7.1.3 Motion statements
- 7.1.4 Post processor statement
- 7.1.5 Auxiliary statements
- 7.1.6 The macro statement in APT
- 7.1.7 APT word definitions

## **UNIT-8 CNC METAL CUTTING TOOLS**

- 8.1.1 Introduction
- 8.1.2 Cutting tool for CNC machines
- 8.1.3 Types of motions in machining
- 8.1.4 Turning and boring 8.1.5 Milling

## **UNIT-9 TROUBLE SHOOTING OF MACHINING PROCESSES**

- 9.1.1 Introduction
- 9.1.2 Types of motions in machining
- 9.1.3 Turning and boring
- 9.1.4 Drilling and reaming
- 9.1.5 Milling

## **UNIT-10 INTRODUCTION TO FMS, CIM SYSTEM AND ROBOTS**

- 10.1 Introduction
- 10.2 Depending on peripherals present in FMS, we can have different types of FMS
- 10.3 Types of flexibility
- 10.4 Design of FMS
- 10.5 Problems faced in implementation of FMS
- 10.6 Computer integrated manufacturing (CIM)
- 10.7 Basic concepts in robotics
- 10.8 The manipulator

10.9 Programming

10.10 Applications of robots

**Reference Book:** Introduction to NC/CNC Machines by Vishal

