Q.26 Discuss the importance of tool offsets, cutter radius compensation and tool wear compensation.

Q.27 Identify common problems in CNC machines related to mechanical, electrical, pneumatic, and electronic components.

Q.28 Explain how on-time fault finding diagnosis tools are used to diagnose and remedy these issues.

Q.29 Explain the concept of automation and its significance in CNC systems.

Q.30 Provide an overview of Flexible Manufacturing Systems (FMS) Group Technology, CAD/CAM and CIM.

Q.31 What are the primary advantages of NC, CNC and DNC systems in modern manufacturing processes? Provide examples of their applications in different industries.

Q.32 Describe the main components of CNC machines, including the Machine Control Unit and input devices.

Q.33 Discuss the importance of axis identification in CNC machines. How does it contribute to the accurate machining of components?

Q.34 Explain the concept of CNC tool holder and its significance in CNC machining operations.

Q.35 Compare different pallet systems used in CNC machines. What are the advantages and disadvantages of each?

Section-D

Note: Long answer type questions. Attempt any two questions out of three Questions. (2x10=20)

Q.36 Give a detailed specifications of CNC lathe machine.

Q.37 What are sensors? What are the main components, characteristics and factors considered in selecting a sensor? Explain the classification of sensors also.

Q.38 Explain the function and working of recirculating ball screw mechanism with a neat diagram.

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Roll No. .....

5th Sem., Branch : Mechatronics
Subject : CNC Machines & Automation

Time : 3 Hrs. M.M. : 100

SECTION-A

Note: Multiple choice Questions. All Questions are compulsory. (10x1=10)

Q.1 Which of the following is a primary advantage of CNC machines?

a) Lower initial investment
b) Higher production rates
c) Limited versatility
d) Manual operation

Q.2 What does CNC stand for ?

a) Computer Numerical Control
b) Central Numerical Control
c) Control Numerical Computer
d) Central Numeric Computer

Q.3 Which type of motion does a CNC machine control?

a) Linear motion only
b) Rotational motion only
c) Both linear and rotational motion
d) None of the above

Q.4 What is the purpose of G-Code in CNC machining?

a) To control spindle speed
b) To program tool paths
c) To monitor coolant levels
d) To adjust feed rates

Q.5 Which of the following is a common type of CNC machine?

a) Lathe b) Drill press
c) Bandsaw d) Hammer

Q.6 What is the role of CAM software in CNC machining?

a) Controlling machine operations in real-time
b) Generating tool paths from CAD designs
c) Monitoring machine temperature
d) Optimizing machine lubrication

Q.7 Which component of a CNC machine is responsible for tool movement?

a) Spindle b) Servo Motors
c) Coolant system d) Controller

Q.8 What is the advantage of using CNC machining for prototyping?

a) Low accuracy
b) High material wastage
c) Quick iteration
d) Limited design complexity

Q.9 What type of automation is commonly used in CNC machining?

a) Mechanical automation
b) Hydraulic automation
c) Pneumatic automation
d) Digital automation

Q.10 Which of the following is NOT a typical application of CNC machining?

a) Automotive manufacturing
b) Aerospace engineering
c) Textile production
d) Medical device fabrication

Section-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

Q.11 What does "Tool Offset" refer to in CNC machining?
Q.12 Which software is used to ceate 3D models of components in CNC machining?
Q.13 What is the primary function of a coolant system in CNC machining?
Q.14 Which type of automation system allows CNC machines to operate without human intervention?
Q.15 What is the significance of the "Feed Rate" in CNC machining?
Q.16 What is the function of a tool turret in a CNC lathe?
Q.17 What is the purpose of the tool offset in CNC machining?
Q.18 Which type of cutting tool is commonly used for high-speed machining in CNC operations?
Q.19 What is the function of a CNC controller?
Q.20 What is the role of CAM software in CNC machining?

Section-C

Note: Short answer type Questions. Attempt any twelve questions out of fifteen Questions. (12x5=60)

Q.21 Discuss the advantages and disadvantages of NC, CNC and DNC systems in manufacturing and provide examples of their applications in various industries.
Q.22 Explain the design features and specifications of CNC machines, including the use of sideways, balls, rollers and coatings.
Q.23 Compare and contrast open loop and closed-loop control systems in CNC machines.
Q.24 Explain the roles of actuators transducers and sensors such as tachometers, LVDTs, and encoders in CNC systems.
Q25 Describe the basic concepts of part programming in CNC machining, including NC words, part programming formats.