Computer Integrated Manufacturing

Assignment Week-1

1. When did the idea of “digital manufacturing” gain prominence?
   a) 1960s
   b) 1970s
   c) 1980s
   d) 1990s

2. _____ is the process of converting raw materials, components or parts into finished goods that meet a customer’s expectations and specifications.
   a) Designing
   b) Manufacturing
   c) Developing
   d) Prototyping

3. Why do businesses sell finished products at a premium in manufacturing?
   a) To cover the cost of raw materials
   b) To make a profit and cover manufacturing costs
   c) To encourage customers to buy more raw materials
   d) None of these

4. Which functional areas are linked through the computer in a CIM system?
   a) Research, Development, Implementation, Marketing
   b) Design, Analysis, Planning, Purchasing
   c) Raw Material, Production, Transportation, Marketing
   d) Feedback, Evaluation, Planning, Execution

5. _____ is the initial stage in the CIM process that involves creating digital representation of products.
   a) Prototype Manufacture
   b) Determining Efficient Manufacturing Methods
   c) Computer-Aided Design
   d) Ordering of Materials

6. Which is not a function of the Manufacturing Support System?
   a) Business functions
   b) Product design
   c) Manufacturing planning
   d) Circular economy

7. Product assembly is performed solely with the help of humans.
    a) True
    b) False

8. _____ will perform complex manufacturing, quality control, reduce materials waste, allowing machines to adapt and improve their performance over time.
    a) Artificial Intelligence
    b) Digital Manufacturing
    c) Internet of Things (IOT)
    d) Subtractive Manufacturing

9. _____ is a chip, an extension card, or a stand-alone device that interfaces with a peripheral device.
    a) Programmable card
    b) Remote card
    c) Adaptive charger
    d) Controller

10. Which function are part of CIM addition to firm?
    a) Only CAD/CAM
    b) Only business functions of the firm
    c) Both of these
    d) None of these

Computer Integrated Manufacturing

Assignment Week-2

1. _____ is a majorly iterative process.
   a) Automation
   b) Marketing
   c) Design
   d) Production

2. Which is not a benefit of CAD?
   a) Productivity Increase
   b) Supports Changeability
   c) Automation of repeated task
   d) Unrealistic product rendering

3. _____ display pictures by dividing the display screen into thousands (or millions) of pixels, arranged in rows and columns.
   a) Color monitor
   b) Graphics monitor
   c) Flat panel display
   d) Raster

4. In the coordinate system, for which coordinate do we have a choice to point it into the screen or out of the screen?
   a) Coordinate Y
   b) Coordinate Z
   c) Coordinate X
   d) None of these

5. _____ is a transformation, which allows a copy of the object to be displayed while the object is mirrored about a line or a plane.
   a) Refraction
   b) Reflection
   c) Reverse
   d) Rotation

6. Which of the following is NOT a type of reflection?
   a) Reflection about the x-axis
   b) Rotation about the Z-axis
   c) Reflection about an axis perpendicular to xy plane
   d) Reflection about line y=x

7. The positive value of the pivot point rotates in the _____ direction.
   a) clockwise
   b) reverse
   c) counterclockwise
   d) forward

8. It is desirable to express all geometric transformations in the form of matrix multiplication only.
   a) True
   b) False

9. The mixture of cyan and magenta will result in the _____ colour.
   a) yellow
   b) green
   c) blue
   d) red

10. In homogeneous coordinates, how is an n-dimensional space represented?
    a) (n-1) dimensional space
    b) (n+1) dimensional space
    c) (n+2) dimensional space
    d) (n/2) dimensional space

Computer Integrated Manufacturing

Assignment Week -3

1. A geometric model contains a description of the modelled object's shape.
   a) True
   b) False

2. _____ is the technique of creating technical drawings whether in 2D or 3D.
   a) Designing
   b) Drafting
   c) Prototyping
   d) Transforming

3. What is a planar surface?
   a) A flat 2D surface
   b) Curved surface
   c) Ruled surface
   d) 3D surface

4. A _____ is a mathematical defined curve used in two-dimensional graphical applications.
   a) B-splines curve
   b) NURBS curve
   c) Bezier curve
   d) Parabola curve

5. Evaluation of NURBS reasonably fast and numerically unstable.
   a) True
   b) False

6. Which of the following is not an advantage of NC?
   a) Simpler fixtures
   b) Shorter lead time
   c) Great accuracy and repeatability
   d) High investment cost

7. The _____ of a Bezier curve can be altered by moving the control points.
   a) shape
   b) colour
   c) plane
   d) phase

8. The implicit of a hyperbola is given by:
   a) $\frac{x}{a} - \frac{y}{b} = 1$
   b) $\frac{x}{a} - \frac{y}{b} = 0$
   c) $\frac{x^2}{y^2} - \frac{y^2}{b^2} = 1$
   d) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 0$

9. _____ defines ±3σ of the mechanical error distribution association with the axis.
   a) Accuracy
   b) Repeatability
   c) Control resolution
   d) Precision

10. Which component of a stepper motor is responsible for creating the electromagnetic field?
   a) Rotor
   b) Bearings
   c) Stator coils
   d) Driver circuit

Computer Integrated Manufacturing

Assignment Week-4

1. What is the most fundamental defining characteristic of a CNC machining centre?
   a) Automatic tool changer
   b) Good quality surface finish
   c) Table clamping mechanism
   d) Spindle orientation

2. The chuck in a CNC Turning machine spins at various:
   a) PPM
   b) MRRs
   c) RPMs
   d) None of these

3. According to the orientation of spindle, CNC machining center can be classified as:
   a) VMCs
   b) HMCs
   c) UMC
   d) All of these

4. Multi-axis cutting tools can move in many directions, enabling the most precise cuts possible on the materials at-hand.
   a) True
   b) False

5. _____ is composed of high carbon steel with a reasonable amount of element alloys like chromium, tungsten, and molybdenum.
   a) Cemented carbide
   b) High speed steel
   c) Clamping system
   d) Retention knob

6. Cemented carbide consist of fine particles of carbide cemented into a composite by a binder metal.
   a) True
   b) False

7. The large nose angles and side cutting angle on the ceramic helps to_____.
   a) avoid coolants
   b) reduce feed rate
   c) increase feed rate
   d) to reduce the tendency of chipping

8. _____ is used in computerized numerical control machine tools to improve the production and tool carrying capacity of the machine.
   a) Tool turret
   b) Automatic tool changer
   c) Tombstone
   d) Modular fixture

9. A tombstone is used for supporting complex workpieces.
   a) True
   b) False

10. What is the first step in the tool change process for a CNC machine when replacing a tool?
    a) Moving the tool change arm to the spindle
    b) Stopping the spindle at the correct orientation
    c) Indexing the tool magazine to the correct position
    d) Picking the tool from the spindle

Computer Integrated Manufacturing

Assignment Week-5

1. An actuation device could be a servomotor, a hydraulic actuator, or a step motor.
   a) True
   b) False

2. NC part programming creates NC _____, which provides the instructions that drive cutters and control machine operations.
   a) codes
   b) symbols
   c) inputs
   d) system

3. What term is used to describe the process where instructions given to the servos are modified according to the measured response of the system?
   a) Open-loop control
   b) Feedback control
   c) Closed-loop control
   d) Servo coordination

4. The Z-axis is considered the most important in machining in the XYZ system.
   a) True
   b) False

5. _____ is a good example of a Point-to-Point (PTP) machine.
   a) Lathe
   b) Rolling Machine
   c) A hole-drilling machine
   d) Machining Center

6. What is the most common motion configuration in many aspects for CNC machines?
   a) Two-axis
   b) Three-axis
   c) Four-axis
   d) Six-axis

7. Automatically programmed tool uses language statements to define part-shape and tool-motion as well as machine tool dependent data.
   a) True
   b) False

8. Which of the following terms is used for commands in NC program that may stay in effective indefinitely until explicitly cancelled or changed by some other command?
    a) Non-modal commands
    b) Single-use commands
    c) Modal commands
    d) Temporary commands

9. _____ is the smallest unit of a CNC program?
    a) Word
    b) Block
    c) Character
    d) Program

10. A block in CNC programming is always a combination of alpha-numeric characters.
    a) True
    b) False

Computer Integrated Manufacturing

Assignment Week-6

1. What does CAD stand for in the context of Solid Works?
   a) Computer Animated Design
   b) Computer-Aided Design
   c) Creative Application Development
   d) Control and Analysis Design

2. Which Solid Works tool is used to create a 3D shape by sweeping a 2D sketch along a path?
   a) Loft
   b) Extrude
   c) Sweep
   d) Revolve

3. In SolidWorks, what does the term "assembly" refer to?
   a) 2D sketch
   b) Collection of parts that fit together
   c) Simulation analysis
   d) Texturing a 3D model

4. How can you create a section view in SolidWorks?
   a) Ctrl + S
   b) Insert > Section View
   c) Tools > Section
   d) View > Section

5. In SolidWorks, what does the "Spline" tool allow you to create?
   a) Helical curves
   b) Curved surfaces
   c) Smooth curves without defined points
   d) Tangent lines

6. Which of the following is not CAM software?
   a) CATIA
   b) Fusion 360
   c) Ultimaker Cura
   d) Siemens NX Cam

7. In PowerMill, what is the basic purpose of the "NC Code" module?
   a) Simulate machine movements
   b) Generate numerical control code
   c) Analyze toolpath efficiency
   d) Control the machine's power supply

8. In PowerMill, what does the term "Input Parameters" refer to?
   a) The speed at which the machine is powered on
   b) Values that define the machining process, such as stepovers and stepdowns
   c) The precision of the machine's movements
   d) The rotation speed of the cutting tool

9. What does the "Profile Form" in PowerMill allow you to define?
   a) The material properties of a part
   b) The geometric limits of the machining area
   c) The toolpath strategy for finishing operations
   d) The shape and dimensions of a profile to be machined

10. In PowerMill, what is the purpose of the "Stock Models" feature in the context of NC Programs?
    a) Simulate the remaining material after previous operations
    b) Specify the cutting conditions, such as feeds and speeds
    c) Generate G-code
    d) Define the geometric limits of the machining area

Computer Integrated Manufacturing

Assignment Week-7

1. CAD stands for Computer Aided Data in the context of Group Technology.
   a) True
   b) False

2. What are the results that group technologies have at the organizational level?
   a) Systematic design and redesign
   b) High-quality level
   c) Less process planning time and setup time
   d) All of these

3. _____ is the planning of production and manufacturing modules in a company or industry.
   a) Process planning
   b) Production planning
   c) Machining planning
   d) Design layout

4. Visual inspection is one of the ways to identify part families.
   a) True
   b) False

5. Which operation in process planning provides a coating on the work surface?
   a) Operation to enhance properties
   b) Finishing operations
   c) Secondary process
   d) Basic process

6. Variant CAPP is based on _____.
   a) Artificial Intelligence
   b) Group Technology
   c) Robotics
   d) Virtual Reality

7. What is identified as the first key to implementing a generative system?
   a) Database development
   b) Decision rules development
   c) Material Processing
   d) Artificial Intelligence

8. The standard process plans in Retrieval CAPP System are stored in offline databases.
    a) True
    b) False

9. Which activity required for new process technologies must be planned and managed?
    a) Decisions
    b) Investment project management
    c) Facilities planning
    d) Manufacturing

10. _____ utilizes the resources allocation of the activities of employees, materials and production capacity, in order to save different customers.

    a) Process planning
    b) Production planning
    c) Manufacturing planning
    d) None of these

Computer Integrated Manufacturing

Assignment Week-8

1. An FMS is capable of producing a single part family or a limited range of part families.
   a) True
   b) False

2. What are the duties performed by the human labors?
   a) NC part programming
   b) Changing and setting cutting tools
   c) Maintenance and repair of equipment
   d) All of these

3. _____ layout allows recirculation of pallets back to the first station in the sequence after unloading at the final station.
   a) In-line
   b) Loop
   c) Open field
   d) Rectangular

4. Which component of AIDC is responsible for converting electrical signal into digital data and finally back into original alphanumeric characters?
   a) Data decoding
   b) Machine reading
   c) Data encoding
   d) Alphanumeric conversion

5. What is a characteristic of Smart Card in AIDC technology?
   a) Utilizes bar code
   b) Involves touch screens
   c) Small plastic cards embedded with microchips
   d) None of these

6. Which of the following is used to drive high current electromagnetic loads?
   a) General – Purpose outputs
   b) Pilot Duty outputs
   c) Discrete inputs
   d) None of these

7. In FMS planning, size and weight determine the size of processing equipment and material handling equipment.
   a) True
   b) False

8. _____ is defined as the three-dimensional space within which the robot can manipulate the end of its wrist.
   a) Work volume
   b) Wrist assembly
   c) Data robot
   d) Polar configuration

9. Contact linear bar code readers focuses a light beam on the bar code and a photodetector reads the reflected signal.
   a) True
   b) False

10. If we perform NAND operation on 1 and 1, what will be its output?
   a) 0
   b) 1
   c) 0.5
   d) None of these

Computer Integrated Manufacturing

Assignment Week-9

1. Documentation is not a part of Computer-Aided Quality Control.
   a) True
   b) False

2. _____ is a procedure in which an unknown quantity is compared to a known standard, using an accepted and consistent system of units.
   a) Measurement
   b) Displacement
   c) Reverse engineering
   d) None of these

3. Resolution in measurement refers to the operating range of the instrument.
   a) True
   b) False

4. Which of the following is an advantage of digital measuring instruments?
   a) Complex interfacing with computers
   b) Limited ease of reading
   c) Finite number of input values
   d) Ease of reading and interfacing to a computer

5. Off-line programs include motion commands, measurement commands, and report formatting commands and is prepared off-line.
   a) True
   b) False

6. _____ compares measurements with part drawing dimension and tolerance.
   a) Tolerance analysis
   b) Part coordinate system
   c) Geometric feature
   d) Probe calibration

7. What is the primary purpose of a Coordinate Measuring Machine (CMM)?
   a) Object fabrication
   b) Measuring geometrical characteristics
   c) Mechanical assembly
   d) Object design

8. _____ is the technique to define and separate regions of interest in the image.
    a) Edge detection
    b) Thresholding
    c) Segmentation
    d) None of these

9. Control charts measure and monitor common causes of variations in the process.
    a) True
    b) False

10. The process average is measured using a _____ chart.
    a) X-bar
    b) R
    c) U
    d) None of these

Computer Integrated Manufacturing

Assignment Week-10

1. Rapid manufacturing has developed as the next stage, in which the need for tooling is eliminated.
   a) True
   b) False

2. The subtractive manufacturing process is considered as _____ compared to other methods.
   a) sustainable
   b) efficient
   c) wasteful
   d) None of these

3. Which of the following is a method of rapid tooling?
   a) Keltool
   b) Investment casting
   c) Sprayed metal tooling
   d) All of these

4. In Selective Laser Sintering, prior heating is required to bring the temperature of the powder below the sintering temperature.
   a) True
   b) False

5. _____ in RM will enable increasingly complex designs to be realized that are fully optimized for the function that they are required for.
   a) Digital freedom
   b) Parts consolidation
   c) Geometrical freedom
   d) None of these

6. Which TECHB software feature controls the amount of material inside the printed object?
   a) Layer height
   b) Infill density
   c) Brim thickness
   d) Print speed

7. What does the term ‘extrusion temperature’ refers to in 3D printing?
   a) Cooling temperature of the printed layers
   b) Melting point of the filament

c) Speed of the extruder motor
d) Thickness of the support structures

8. How does adjusting the print bed temperature impacts the 3D printing process?
   a) Changes the layer height
   b) Alters the color of the printed object
   c) Affects layer adhesion to the build platform
   d) Modifies the infill pattern

9. What role does the 'Timeline' play in Fusion 360?
   a) It shows a history of changes made to the design
   b) It controls the speed of animations
   c) It determines the rendering settings
   d) It displays the print progress in 3D printing

10. Which file format is commonly used for 3D printing and is supported by most 3D printers?
    a) JPG
    b) PNG
    c) STL
    d) GIF

Computer Integrated Manufacturing

Assignment Week-11

1. As per the material handling principles, the material should be moved individually rather than in lots.
   a) True
   b) False

2. Which of the following is the objective of material handling?
   a) To increase manufacturing costs
   b) To provide better working conditions
   c) To decrease storage capacity
   d) To slow down material flow

3. In material handling, what determines whether the material must be moved in individual units, as batches, or continuously?
   a) Flow rate
   b) Scheduling
   c) Routing
   d) Buffer stocks

4. In which of the following areas can Automated Guided Vehicles be utilized?
   a) Assembly line
   b) Storage and distribution
   c) Flexible manufacturing system
   d) All of these

5. Cranes are majorly used for vertical lifting of materials.
   a) True
   b) False

6. What does PLM stand for?
   a) Project Lifecycle Management
   b) Product Lifecycle Management
   c) Process Lifecycle Management
   d) Program Lifecycle Management

7. What does the ‘Source’ object represent in Tecnomatix Plant Simulation?
   a) The end point of the material flow
   b) The starting point of the material flow
   c) A placeholder for objects
   d) A component for sorting

8. In Tecnomatix Plant Simulation, what does the ‘Event Controller’ object control?
    a) Material handling
    b) Angular conversion
    c) Buffer management
    d) Flow control

9. Which distribution in Tecnomatix Plant Simulation is characterized by its flexibility and is often used for modeling uncertainty with shape parameters?
    a) Uniform Distribution
    b) Triangular Distribution
    c) Beta Distribution
    d) Normal Distribution

10. What is the purpose of the ‘Availability’ object in Tecnomatix Plant Simulation?
    a) Simulation of production processes
    b) Representation of a single process step
    c) Simulation of resource availability
    d) Simulation of sorting processes

Computer Integrated Manufacturing

Assignment Week-12

1. Reinforcement learning is characterized by learning through rewards and punishment without explicit training.
   a) True
   b) False

2. Which type of AI involves machines with the ability to perform any intellectual task that a human can do?
   a) Narrow AI
   b) General Intelligence
   c) Super Intelligence
   d) Weak AI

3. What is one of the dimensions of Digital Manufacturing?
   a) Data center management
   b) Customer relationship management
   c) Smart factory
   d) Employee training development

4. The Internet of Things (IOT) merges the digital and physical universe, making the manufacturing more smarter but less responsive.
   a) True
   b) False

5. Which of the following is the core application of Big Data in manufacturing?
   a) Pollution control
   b) Risk management
   c) Disposal management
   d) Marketing management

6. The use of IOT sensors in manufacturing equipment enables condition-based maintenance alerts.
   a) True
   b) False

7. What is the main advantage of AR application in manufacturing?
   a) Better feedback
   b) Better preview
   c) Detailed models
   d) All of these

8. Cyber security has become a critical component of effective management in manufacturing.
    a) True
    b) False

9. _____ is the engineering application of computers and computer- controlled machines for the definition and inspection of the quality of products.
    a) CAQ
    b) CMM
    c) FMS
    d) GT

10. Both AR and VR help in automating the process by using distance controlling.
    a) True
    b) False