Assignment 5

CNC, Industry
4.0

1- CNC machining is usually used for a large production volume …
   a. > 100 000 part
   b. < 100 000 part
   c. > 500 000 part
   d. < 500 000 part

2- Adaptive control is utilized in CNC machines to
   a. Optimize production rate
   b. Optimize production cost
   c. Optimize tool wear
   d. All answers are correct
   e. None of the answers is correct

3- A numerically controlled machine is called
   a. CNC
   b. PLC
   c. STL
   d. All answers are correct
   e. None of the answers is correct

4- PTP motion is used in the following operation on the CNC machine
   a. Drilling
   b. Turning
   c. Milling
   d. All answers are correct
   e. None of the answers is correct

5- A continuous path motion in a CNC is the
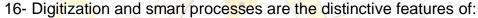   a. Contouring
   b. Drilling
   c. Boring
   d. Reaming

6- The G-code: G91 G0 X2.0 Y-2.0, leads to the tool motion: from point (5,4) to point (7,2) for the following conditions:

    a. Rapid motion & absolute positioning
    b. Rapid motion & incremental positioning
    c. Cutting motion & absolute positioning
    d. Cutting motion & incremental positioning.

7- For a CNC machine to perform a feed motion at feed rate 150, from point (10,20) to point (100,50) using the incremental positioning, the following G-Code must be given
    a. G91 G01 X90 Y30 F150
    b. G91 G00 X90 Y30 F150
    c. G90 G00 X100 Y50 F150
    d. G90 G01 X90 Y30 F150
    e. Answers a&c are correct

8- To set the spindle speed of a CNC machine at 500 rpm anticlockwise direction, the following code should be given
    a. S500 M04
    b. S500 M03
    c. G00 500 M03
    d. M03 500

9- The CNC G-code program must end with ….. to start prepare for the next job
    a. M30
    b. M31
    c. Has no end line

10- To safely operate a CNC machine, the safe start line must be entered at first to:
    a. Cancel all previous orders
    b. To select the absolute positioning and return to machine zero
    c. To select absolute positioning and return to work piece zero
    d. All answers are correct
    e. a&b are correct

11- The safe start line is written as follows:
    a. G00 G90 G54 G17 G40 G49 G80
    b. G01 G91 G54 G17 G40 G49 G80
    c. G00 G91 M0 S0 T0 F0
    d. G00 X0 Y0 Z0

12- In the CNC program the line: T1 M6 means:
    a. Position 1 and spindle speed 6
    b. Change tool and insert tool number 1
    c. Tool number 1
    d. a&c are correct

13- Automation is implemented in the following areas
    a. Material handling.
    b. Maintenance.
    c. Process planning.
    d. Product development

14- CAE is the abbreviation of:
    a. Computer Aided Emergency
    b. Computer Aided Engineering
    c. CAD Engineering
    d. CAM engineering

15- Product market success guidelines are
    a. Cost, maintenance, material
    b. Quality, time, cost
    c. Recycling, value added, marketing
    d. Marketing, design, material & processes

16- Digitization and smart processes are the distinctive features of:
    a. Cyber physical systems
    b. Smart factories
    c. Industry 3.0
    d. Industry 4.0

17- Cobots are
   a. Collaborative robots which interact with all variables in the surrounding environment
   b. Interactive CNC machines which interact with other machines
   c. Robots that fabricate smart products
   d. The future robot which interact with other cobots

18- Computer controlled systems containing sensors, actuators and embedded systems interacting together via wireless networks and internet.
   a. IoT
   b. Cyber physical systems
   c. Cobot
   d. Cloud computing

19- Factories and logistic systems that will operate and organize themselves without human interaction
   a. Cyber physical systems
   b. Internet of things
   c. Collaborative robots

20- Industry 4.0 concept is only applicable in very limited fields of future life
   a. True
   b. False

21- In the future, and due to establishment of Industry 4.0 there will be no more need for human workers

   a. True, because all workers will be replaced by cobots

   b. False, the workers will need to develop new skills matching the new technology
   c. True, because Industry 4.0 is only based on computers and will only serve computers and robots
   d. False, because Industry 4.0 is only a concept and it is very difficult to be established in the future

22- only important field of specialization for establishing Industry 4.0 is the computer technology

    a. True, because everything will be computer based and the other specializations will be obsolete

    b. False, because the transformation of all the current systems will require the competencies from all specializations to be redesigned and readapted to the new technology.

    c. True, because only computer engineers will have careers in the future

    d. False, all specializations will need to include the computer technology to be able to continue the research and development and offer continuous modifications and improvements.

    e. b& d are correct

23- This technology connects the machines and objects together within a cyber-system

    a. IoT
    b. Sensors
    c. Internet

24- This is responsible of virtually constructing and analyzing a factory

    a. Virtual commissioning
    b. Virtual reality
    c. Augmented reality
    d. Digital twin

25- It is a soft & virtual copy of a real product

    a. Virtual reality
    b. Simulation
    c. Digital twin
    d. Virtual commissioning

26- IT infrastructure that all cyber connected systems can access without the need for installation

    a. Cloud
    b. Data analytics
    c. Big data

27- RFID tags are mainly employed in smart factories to

     a. Identify and trace the products
     b. Identify and trace the raw materials
     c. Identify and trace the tools
     d. All answers are correct
     e. None of the answers is

correct

28- Virtual production aims at
     a. Early identification of problems in production
     b. Producing the digital twin
     c. Training of the workers on the production
     d. All answers are correct
     e. None of the answers is

correct.

29- What is expected from future
   workers?
     a. High interdisciplinary skills
     b. Continuous development
     c. Computer skills only
     d. All answers are correct
     e. None of the answers is correct

30- What must happen so that industry 4.0 could be implemented in the near
   future?
     a. Engagement of workers in the work strategies
     b. Cooperation between companies and factories
     c. Horizontal and vertical integration and interoperability of engineering