# PREVIOUS YEARS QUESTION PAPERS
# CNC MACHINES AND AUTOMATION

**PAPER-2017**

***Time: Three Hours*** ***Maximum Marks : 100***

## SECTION-A

**Q.1.** *Attempt any 15 parts.* ***(15×2 = 30)***

(*i*) What is DNC machine?
(*ii*) What is feed rate?
(*iii*) What is an encoder?
(*iv*) Define work zero.
(*v*) What software is used to control the CNC machine?
(*vi*) Define spindle speed.
(*vii*) Define interpolation.
(*viii*) What is automaticity?
(*ix*) Define machine reference point.
(*x*) How is the actual machine code generated?
(*xi*) What is cutting speed?
(*xii*) What is cutter radius compensation?
(*xiii*) What are advantages of employing Anti-friction guideways?
(*xiv*) What is qualified tooling?
(*xv*) What is Preparatory function?
(*xvi*) What is parity check?
(*xvii*) Name various NC words.
(*xviii*) Define Response and damping.

## SECTION-B

**Q.2.** *Attempt any 10 parts.* ***(10× 4 = 40)***

(*i*) Differentiate between conventional and CNC machines.
(*ii*) What is PLC? Explain briefly.
(*iii*) Enlist applications of CNC machines.
(*iv*) Write short note on requirements of Work holding devices.
(*v*) Differentiate between open and close loop control system.

(*vi*) Explain briefly Automatic tool changer.

(*vii*) Explain advantages and disadvantages of automation.

(*viii*) Explain the position control and its types.

(*ix*) Explain in brief constructional details of CNC machines.

(*x*) What are three methods used for setting machine origin?

(*xi*) Explain, how tooling is used in automatic tool change function?

(*xii*) What is Do-loop? What is the format of a Do-loop?

(*xiii*) Write short note on cutting tools.

(*xiv*) Explain any two G codes and any two M codes.

(*xv*) What are the various requirements in selecting proper feedback devices for CNC machines?

## SECTION-C

**Note :** *Attempt any 3 questions.* ***(3× 10 = 30)***

**Q.3.** What are the various work holding device used in CNC machines? Explain any two of them in detail.

**Q.4.** Explain the various methods for swarf removal in CNC machines.

**Q.5.** Write note on the following :

(*i*) Sub-routine/sub program

(*ii*) Quality of a good part programmer

**Q.6.** Explain the following :

(*i*) Motion control system

(*ii*) Tool positioning system

**Q.7.** What are the common faults and their remedies found in CNC's? Describe.

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# PAPER-2018

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***Time: Three Hours*** ***Maximum Marks : 100***

## SECTION-A

**Q.1.** *Attempt any 15 parts.* ***(15×2 = 30)***

(*i*) What do you meant by CAD/CAM?

(*ii*) What are transducers?

(*iii*) Convert 27 of decimal into equivalent Binary number.

(*iv*) What is Backlash error in CNC design?
(*v*) What are the two types of feedback devices used in CNC?
(*vi*) What are paraxial control systems?
(*vii*) What is block number in a part program?
(*viii*) What do you mean by part program?
(*ix*) What is swarf removal?
(*x*) What do you mean by "Resolution"?
(*xi*) What is an Encoder?
(*xii*) What is a Qualified tool?
(*xiii*) Which type of production is best for automation?
(*xiv*) Define CNC machines.
(*xv*) Write two applications of PLC.
(*xvi*) What are the incremental coordinate systems?
(*xvii*) Why Y-Axis is not available in lathes?
(*xviii*) What do you mean by manuscript?

## SECTION-B

**Q.2.** *Attempt any 10 parts.* ***(10 × 4 = 40)***

(*i*) Explain the types of DNC.
(*ii*) Write a note on encoders.
(*iii*) Write a short note on Punched card and punched paper tape.
(*iv*) How Axis of CNC lathe machine is designated?
(*v*) What are differences between open loop and closed loop CNCs?
(*vi*) What are the basis instructions in a PLC?
(*vii*) Differentiate between absolute and incremental coordinate system.
(*viii*) Write short notes on MCU.
(*ix*) Describe any two types of input reader units.
(*x*) Differentiate between response and setting time.
(*xi*) What is tool offset and cutter radius compensation?
(*xii*) What are the special functions in CNC?
(*xiii*) Differentiate between qualified and semiqualified tool.
(*xiv*) What are the advantages of pneumatic drives over hydraulic drives?
(*xv*) Why do we require special construction features in CNCs?

## SECTION-C

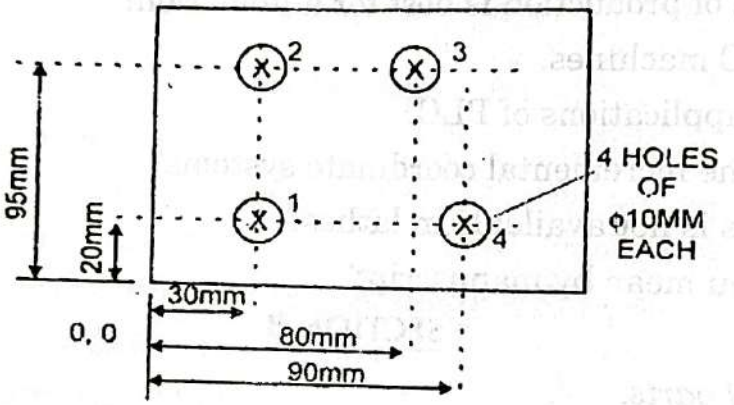
**Note :** *Attempt any 3 questions.* **(3×10 =30)**

**Q.3.** (*a*) Write note on recirculating ball screw and nut assembly and its applications.

(*b*) Write note on servo motor and its applications.

**Q.4.** Explain the procedure for developing manual part programming.

**Q.5.** Write a part program for Drilling of 4 holes as shown in Fig. Table spindle speed = 1440 R.P.M. and Feed Rate as 140 mm/min. The position of Drill Edge is zero, 80 mm above the table surface. The thickness of plate is 25 mm.

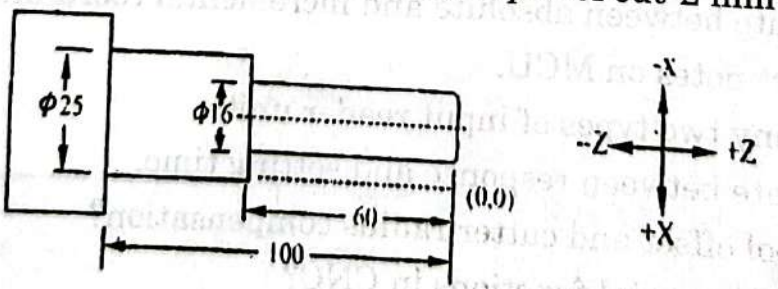



**Q.6.** (*i*) What are contouring systems? How they are different from paraxial systems?

(*ii*) Describe any two safety devices used in CNC with diagrams.

**Q.7.** Write a part program for the following diagram, assuming speed and feeds. Operation facing, cleaning cut, reduction of diameter to 16 mm from 25 mm diameter.

Feed 200 mm/min, speed 800 rpm and depth of cut-2 mm per cut.



# CNC MACHINES AND AUTOMATION

## PAPER-2019

*Time: Three Hours* *Maximum Marks: 100*

### SECTION-A

**Note:** *Objective type questions. All questions are compulsory.* ***(10×1=10)***

1. Give full form of CNC.
2. Write full form of CBN.
3. Write another name of non-feedback control system.
4. Time dependent characteristics are called ..... characteristics. (fill in the blank)
5. Write the use of tachometer.
6. Define part family.
7. Define unrecoverable fault.
8. Give another name of fixed automation.
9. Write full form of ClM.
10. Define group technology.

### SECTION-B

**Note:** *Very short answer type questions. Attempt any* ***ten*** *questions out of* ***twelve*** *questions.* ***(10×2=20)***

11. Name the types of tool positioning systems in CNC systems.
12. Write any two applications of CNC Machines.
13. Give any two criteria's for tool selection.
14. Give composition of HSS.
15. Give the block diagram of a transducer.
16. Give types of tachometer.
17. Explain any two G codes.
18. Define part programming.
19. Describe cutter radius compensation.
20. Describe a logic-pulser.
21. Write the tools used for finding on-line faults in CNC machines.
22. Write any two advantages of automation.

## SECTION-C

**Note:** *Short answer type questions. Attempt any* ***eight*** *questions out of* ***ten*** *questions.* *(8×5=40)*

**23.** Explain axis identification of a CNC system.

**24.** Differentiate conventional and CNC machines.

**25.** Write the advantages of Anti friction guide ways.

**26.** List the main requirements of slide ways in a CNC system.

**27.** Give classification of transducers.

**28.** Differentiate between encoders and decoders.

**29.** Discuss briefly the working of potentiometer.

**30.** Write short note on subroutine.

**31.** Explain the classification of faults in CNC machines.

**32.** Give the five applications of robots.

## SECTION-D

**Note:** *Long answer type questions. Attempt any* ***three*** *questions out of four questions.* *(3×10=30)*

**33.** Describe LVDT. Explain the construction, working and advantages of LVDT in detail.

**34.** Explain canned cycle with an example.

**35.** Explain different types of automation along with advantages and limitation.

**36.** Explain classification of robots in detail.

# CNC MACHINES AND AUTOMATION

## PAPER-2020

*Time: Three Hours* *Maximum Marks: 100*

### SECTION-A

**Note:** *Objective type questions. All questions **are** compulsory* ***(10×1=10)***

1. NC stands for _____
2. Write full form of LVDT.
3. _____ axis is always parallel to spindle axis.
4. ATC stands for _____
5. Write full form of CAD.
6. _____motors are used in open loop control system.
7. Name various input devices used in control system.
8. Name the type of Encoder.
9. G91 is used for _____ function.
10. Name the feedback devices used in control system.

### SECTION-B

**Note:** *Very Short answer type questions. Attempt any **ten** questions out of **twelve** questions.* ***(10×2=20)***

11. What are end effector?
12. Write short note on NCU.
13. Define law of Robotics
14. What is Tachometer?
15. Write the benefits of group technology.
16. Write the word used for feed rate with example.
17. Name different cutting tool materials.
18. Define OPTO INTERRUPTER.
19. What do you mean by Transducer?
20. Define work zero.
21. Write short note on "Online fault finding technique".
22. Write any two limitations of CNC Machine.

## SECTION-C

**Note:** *Short answer type questions. Attempt any* ***eight*** *questions out of ten questions.* *(8×5=40)*

**23.** State advantages and disadvantages of robots.

**24.** List any five difference between conventional M/C and CNC M/C.

**25.** Explain the following terms:-

(*a*) Subroutines (*b*) Do loops

**26.** Define FMS and its benefits.

**27.** Explain any two part programming format.

**28.** Define sensor and explain different type of sensors.

**29.** Write a short note on stepper motor and servo motor.

**30.** State the difference between open loop control system and close loop control system.

**31.** Define Tool Magazine and its types.

**32.** State the difference between Absolute and incremental programming.

## SECTION-D

**Note:** *Long answer type questions. Attempt any* ***three*** *questions out of four questions.* *(3×10=30)*

**33.** What are the common problems in mechanical component of a CNC machine?

**34.** What are the main requirement of slideways in CNC system and also discuss difference type of slideways?

**35.** Define Numeric control. What are the different components of an NC system.

**36.** Explain canned cycle with an example.

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