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**Question Paper Code : 53342**

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Fourth/Fifth Semester

Manufacturing Engineering

MF 6505 — CNC MACHINING TECHNOLOGY

(Common to Mechatronics Engineering/Robotics and Automation Engineering)

(Regulation 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List out any four commonly used CNC controllers.
2. What is the primary purpose of computer aided inspection?
3. What is meant by preloading of ballscrew?
4. What are the basic functions of a bearing?
5. List any four requirements of feed drives for CNC machine tools.
6. How do you sense the direction of motion while using grating type transducer?
7. What is meant by cutter radius compensation?
8. What is meant by do loops?
9. State the advantages of inserted type cutting tools.
10. What are the objectives of preset tooling?

PART B — (5 × 13 = 65 marks)

11. (a) (i) With a neat block diagram explain the functions and advantages of Distributed Numerical Control system. (7)
- (ii) Explain with neat sketches the classification of CNC machines based on tool motion. (6)

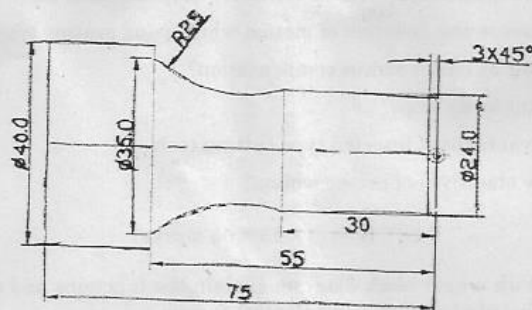
Or

- (b) Enumerate the classification of CNC machines and describe the principles of operation of CNC EDM machine with a neat sketch. (4+9)

12. (a) Explain the following in detail with neat sketches
- (i) Anti friction linear motion guideway (7)
  - (ii) Recirculation ball screw. (6)
- Or
- (b) Name the various methods used in the CNC machines to transmit torque. Explain any two of them with neat sketches.
13. (a) Describe the principles of operation of (i) Stepper motor and (ii) Linear motor with neat sketches. (7+6)
- Or
- (b) Explain the usage of (i) Laser interferometer and (ii) Inductosyn as position detection device. (7+6)
14. (a) What is meant by canned cycle? Explain any three canned cycles with examples.
- Or
- (b) Write short notes on (i) Subroutine (ii) Parametric programming and (iii) Mirror image. (4+5+4)
15. (a) Discuss the properties, advantages and limitations of Carbides, Ceramics and PCD as cutting tool materials.
- Or
- (b) Explain the tooling system for Machining centre and Turning Centre.

PART C — (1 × 15 = 15 marks)

16. (a) Write a CNC program with appropriate assumptions to machine a component made of aluminum using CNC turning centre, as shown in figure below.



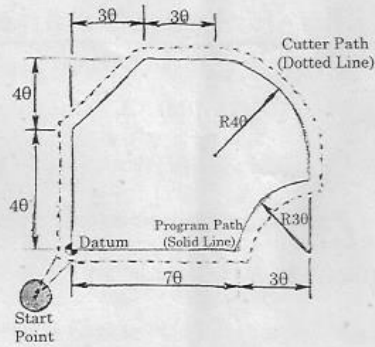
All dimensions are in mm

Or

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- (b) Write the CNC program with appropriate assumptions for manufacturing the component shown in figure below, using CNC machining centre. The thickness of the workpiece is 10 mm.



All dimensions are in mm