Reg. No. | | | | | | | | |

B.E. DEGREE END SEMESTER EXAMINATIONS, April/ May 2012

MANUFACTURING ENGINEERING BRANCH

V SEMESTER (REGULATIONS 2008)

MF 9305 CNC MACHINING TECHNOLOGY

Time: 3 Hours Maximum: 100 Marks

Answer ALL questions

PART A - (10 X 2 = 20 marks)

1. State any four advantages of CNC.
2. List out any four commonly used CNC controllers.
3. What is meant by bifurcated structure and why is it used?
4. Sketch and indicate the errors that can be compensated by using flexible couplings.
5. Distinguish between open loop and closed control system in the context of CNC control system.
6. What are the limitations of grating type axis measuring system?
7. What is meant by cutter radius compensation: how is it programmed?
8. Distinguish between parametric and sub programs.
9. State various daily activities to be performed in the preventive maintenance of CNC machine tools.
10. Describe briefly ISO classification of carbide inserts.

PART B – (5X16=80 Marks)

11 i) Discuss the classification of CNC machines based on type of tool motion. (8)
ii) Describe salient features of CNC turning centre. (8)

12a i) What are the requirements of guideways used in CNC machine tools? Explain with neat sketches working principle of any two antifriction guideways. (10)
ii) Enumerate with neat sketch the principle of planetary recirculating roller screw. (6)

(or)

12b i) State the limitations of ACME threaded lead screw? Describe with neat sketch working principle of Ballscrew. State its advantages. (10)
ii) Describe the structural configuration of CNC machining centre. (6)

13a i) List out various feed drives. Compare advantages and limitations of them. (8)

ii) A stepper motor has 220 step angles. Its output shaft is directly coupled with a leadscrew with pitch = 5 mm. The worktable of a positioning system is driven by the leadscrew. The table must move a distance of 60 mm from its current position at a travel speed of 160 mm/min. Determine

How many pulses are required to move the table the specified distance (4)

What is the required motor speed and pulse rate to achieve the table speed? (4)

(or)

13 b) Explain with neat sketches working principle of the following:

i) Angular gratings (8)

ii) Laser inductosysn (8)

14 a i) Enumerate with example any four canned cycles. (8)

ii) Describe with neat block diagram various steps involved in the development of proven part program in CNC machining. (8)

(or)

14 b) Write manual part program for the component shown in Fig Q. 14 b).

List the assumptions made.

15 a) Discuss briefly any four important requirements of cutting tool materials.

Enumerate any four cutting tool materials used in CNC machine tools.

(or)

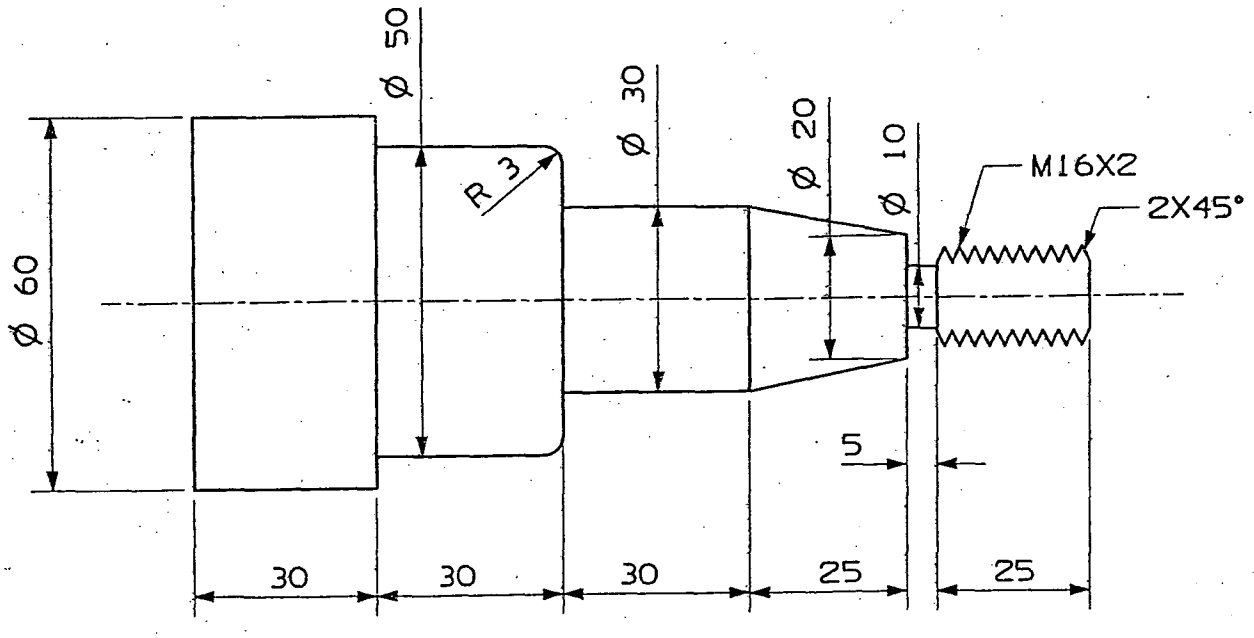
15b) Write short notes on

i) Qualified tooling

ii) Preset tooling

iii) Chucks

iv) V' blocks and angle plates (4X 4 = 16)



ALL DIMENSIONS ARE IN mm.

Fig Q 14 b)