C 3318

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Fifth Semester

Mechatronics Engineering

MH 1301 — CNC TECHNOLOGY

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What production environment requires CNC machines?

2. What are the advantages of CNC compared to NC?

3. Write short notes recirculating roller packs.

4. What are the important requirements of a CNC machine spindle?

5. List out any four CNC interpolation methods.

6. What is tool preset?

7. What is a part program?

8. Explain circular pocketing with an example.

9. What are the aspects considered while selecting a particular CNC machine from a wide variety of available CNC machines?

10. What are the actions taken before introducing CNC machines in an industry?

PART B — (5 × 16 = 80 marks)

11. (a) (i) What are the factors that contributed to the development of numerical control. Discuss in detail. (8)

(ii) What are the fundamental aspects of machine control? (8)

Or

(b) (i) What are the controllable components of a CNC machine? (8)

(ii) What are the important specifications of a CNC machine? (8)

12. (a) (i) Discuss backlash measurement and compensation. (8)

(ii) What are the different types of automatic tool changers? Explain any one. (8)

Or

(b) How can a conventional lathe be retrofitted with CNC control? Explain in detail.

13. (a) How the incremental and absolute rotary encoders used in CNC machines? Explain with diagrams. (16)

Or

(b) Discuss in detail the following :

(i) Magnetic sensors for spindle orientation. (4)

(ii) Qualified tools. (4)

(iii) Work holding devices used in CNC machines. (8)

14. (a) Write a CNC part program for the rotational component shown in figure 14. (a) using G amd M codes. Any missing dimension can be proportionately assumed.

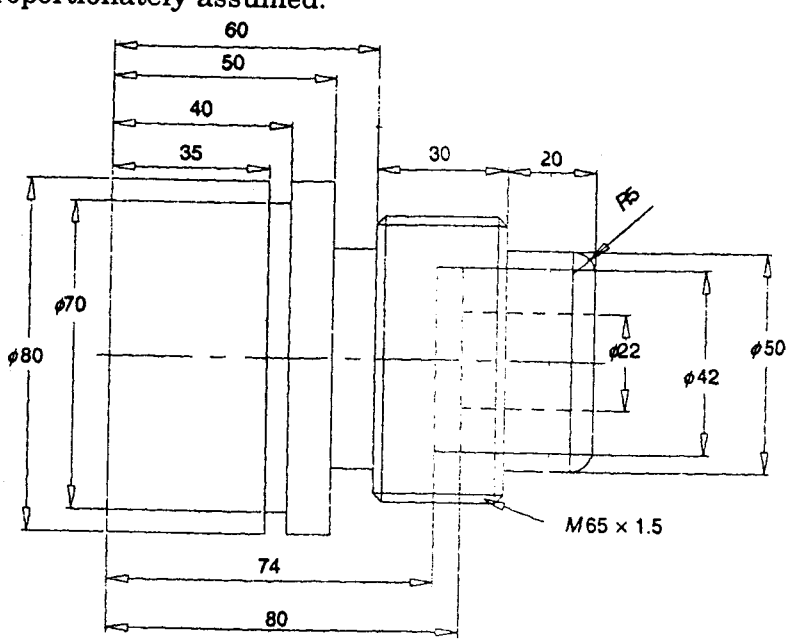

Fig. (14) (a)

Or

(b) What are the steps in CAD/CAM approach to part programming? (16)

15. (a) Discuss the various costs involves in the operation of a CNC machine. (16)

Or

(b) What are the predictive maintenance techniques that can be used for the CNC machines? (16)
