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J 3329

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2009.

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. State any four factors to be considered to justify the use of CNC machines.

2. State any four advantages of CNC machines.

3. State true or false. Justify your answer. Stepper motor can be used as feed drive in a CNC turning centre.

4. How a tool change occurs in a typical automatic tool changer?

5. List out any four CNC interpolation methods.

6. Distinguish between incremental and absolute measuring devices.

7. What is meant by cutter radius compensation and how is it programmed?

8. State the functions of the following G and M codes.
   G02 G03 M03 M04

9. How are non cutting times reduced in CNC machines?

10. What is meant by retrofitting of a lathe?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe with a neat sketch the principle of working of a CNC machine tool. (8)

(ii) Enumerate with neat sketches classification of CNC machines based on tool motion. (8)

Or

(b) (i) Describe a CNC wire EDM machine. (8)

(ii) Describe the features of a horizontal machining centre. (8)

12. (a) (i) Enumerate the principle of working of a DC variable speed drive used in a CNC machine tool. (8)

(ii) Describe the factors influencing the selection of transmission belting in the power drive of a CNC machine tool. (8)

Or

(b) (i) Explain with neat sketch working principle of recirculating ball screw. (8)

(ii) Describe the principle of working of an automatic pallet changer (APC). (8)

13. (a) (i) Discuss any four features available in a CNC control system. (8)

(ii) Enumerate with a neat sketch principle of working of linear inductosyn. (8)

Or

(b) (i) Explain the terms, 'Qualified tooling' and 'Preset tooling' in the context of CNC tooling. (8)

(ii) Describe the work holding devices suitable for CNC machine tools. (8)

14. (a) (i) Describe with a block diagram various steps involved in computer assisted part programming. (8)

(ii) Discuss APT post processor and auxiliary statem[illegible] (8)

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(b) Fig. Q 14 (b) shows a die aperture to be machined from a pre-machined block held in a vice on a CNC milling machine. Write a part program to

(i) Mill out the aperture using a 10 mm diameter slot drill. (8)

(ii) Drill and ream the dowel holes. (8)

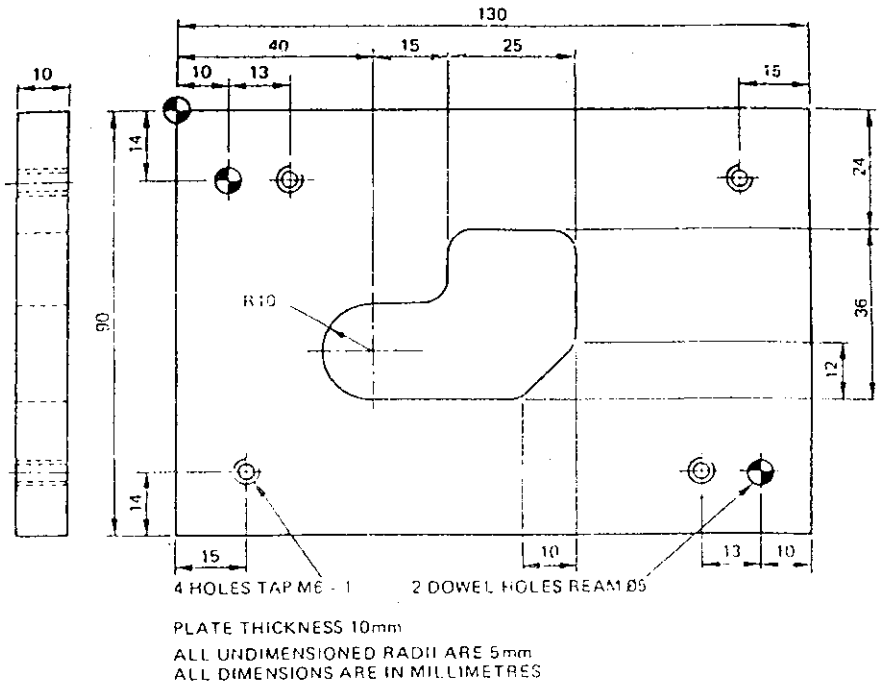

Fig 14. b)

Plate thickness 10 mm

All undimensioned radii are 5 mm

All dimensions are in millimetres

Fig. 14. (b).

15. (a) What are the factors influencing the selection of CNC machines? Discuss any seven factors.

Or

(b) Describe different types of preventive maintenance programmes for CNC machine tools.