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B.E. DEGREE END SEMESTER EXAMINATIONS, NOV/ DEC 2011

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 CNC interpolation methods.
2. Briefly explain any two features of CNC machining centre.
3. What are the advantages of timing belts?
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. How do you sense the direction of motion while using grating type transducer?
7. What is meant by tool nose radius compensation: how is it programmed?
8. Distinguish between diametric and radius programming.
9. State true or false. Justify your answer. PCD can be used for machining alloy steels.
10. State various weekly activities to be performed in the preventive maintenance of CNC machine tools.

PART B – (5X16=80 Marks)

- 11 i) Describe with neat sketches classifications of CNC machines based on tool motion. (8)
- ii) Discuss with neat diagram features of CNC turning centre. (8)

- 12a i) What are the limitations of friction guideways. Describe with neat sketches working principle of any two antifriction guideways. (10)
- ii) Enumerate with neat sketch the principle of recirculating roller screw. (6)

- (or)
- 12b i) Describe with neat sketch working principle of Ballscrew. State its advantages and limitations (10)
- ii) Describe briefly the salient features of CNC spindle assembly. (6)

- 13a) Enumerate with neat sketches working principle of the following:
 - i) Laser interferometer (8)
 - ii) Angular gratings (8)

(or)

- 13 b i) List out various feed drives used in CNC machine tools. Explain any one (8)
- ii) A stepper motor has 220 step angles. Its output shaft is directly coupled with to 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)

- 14a) Write short notes on
- i) Canned turning cycle (5)
 - ii) Mirror image (5)
 - iii) Parametric programming (6)

(or)

- 14 b) Fig. Q14 b) shows a die aperture to be machined from a pre-machined block held in a vice on a milling machine. Write a part program to
- (i) Mill out the aperture using a 10mm diameter slot drill. (6)
 - (ii) Drill and ream the dowel holes. (8)
 - (iii) Mention the assumptions made. (2)

- 15 a) Enumerate the terms, "qualified", "semi-qualified", "preset tooling" and "indexable inserts" in the context of CNC tooling.

(or)

- 15b) Write short notes on
- i) HSS
 - ii) CBN
 - iii) Hydraulic Chucks
 - iv) Machine vices (4X 4 = 16)

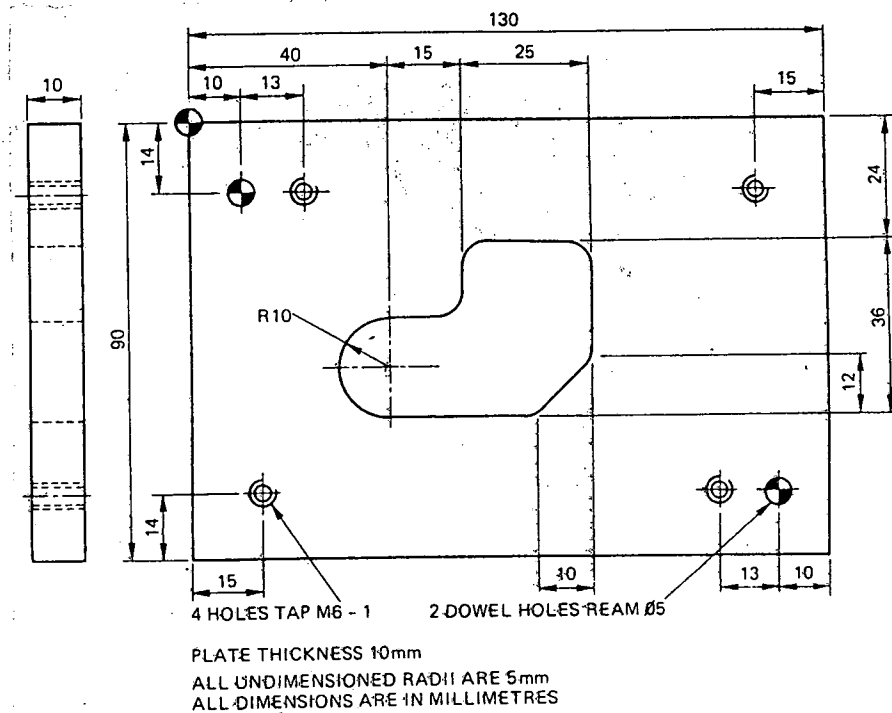


Fig. Q 14 b)