

22/11/13

Reg. No.

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

B.E. DEGREE END SEMESTER EXAMINATIONS, Nov/ Dec 2013

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. Make neat sketches of a horizontal and a vertical machining centre and indicate the primary X, Y and Z axes of motion.
2. List out any four CNC interpolation methods.
3. What is meant by preloading of ballscrew?
4. State true or false. Justify your answer. Aerostatic guideways can be effectively used in CNC machining centre.
5. State any four requirements of spindle drives for CNC machine tools.
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 parametric and sub programs.
9. State various weekly activities to be performed in the preventive maintenance of CNC machine tools.
10. What is meant by the following ISO coding system of carbide inserts used in turning?
TNGG220404

PART B - (5X16=80 Marks)

- 11 i) Enumerate the salient features of CNC machining centre. (8)
- ii) Discuss the classification of CNC machines based on type of tool motion. (8)
- 12a i) What are the limitations of friction guideways? Explain with neat sketches working principle of any two antifriction LM guideways. (10)
- ii) Enumerate with neat sketch the principle of planetary recirculating roller screw. (6)
- (or)
- 12b i) Describe the structural configuration of CNC machining and turning centre. (8)
- ii) Explain various design criteria to be considered in the design of spindle for CNC applications (8)
- 13a i) List out various feed drives. Compare the advantages and limitations of them. (8)
- ii) A stepper motor has 220 step angles. Its output shaft is directly coupled with

(OR)

- b) i) Discuss on the methodology of concept selection. Consider suitable product of your own choice (8)
ii) What are the benefits of concept selection in improving product characteristics (8)

13. a) i) Explain the importance of 3'S in product development process (8)
ii) Discuss on any two types of product architecture. Compare their own merits and limitations. (8)

(OR)

- b) i) What do you mean by fundamental and incidental interactions in product architecture? Explain. (8)
ii) What are the benefits of concept selection in improving product characteristics (8)

14. a) i) Enumerate the process and importance of value analysis (8)
ii) What are the tools adopted to evaluate product performance? Explain their importance (8)

(OR)

- b) i) Describe the product based on 'technology driven' and 'user driven' (8)
ii) How are customer needs investigated and applied in industrial design. Give your own product as example (8)

-
15. a) i) How are prototypes classified? Explain any four of them (8)
ii) Suggest a method to rapidly make a prototype of 'human skull'. Explain (8)

(OR)

- b) i) Discuss on the method of reducing the cost of a component and that of assembly (8)
ii) What is meant by Rapid tooling? Explain its advantages and limitations. (8)