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Question Paper Code : 10919

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

Fourth Semester

Mechanical Engineering

ME 8451 – MANUFACTURING TECHNOLOGY – II

(Common to : Industrial Engineering/Industrial Engineering and Management/Mechanical Engineering (Sandwich)/Mechanical and Automation Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention the main sources of heat in a metal cutting operation.
2. Define the term : Machinability.
3. Recall the formula to calculate the amount of set over in a turned component.
4. List any four advantages of a Swiss type automatic lathe.
5. Define tapping and how it is performed.
6. State the limitations of gear cutting using formed cutter method.
7. Mention any four parameters to be considered in selection of grinding wheel.
8. Write a short note about broaching process.
9. Recall the need of servo motor for table drives in a CNC machine.
10. State the importance of micromachining in Industry 4.0 era.

PART B — (5 × 13 = 65 marks)

11. (a) Describe the different types of chips with neat sketches.

Or

- (b) Illustrate the nomenclature of a single point cutting tool with a neat sketch.

12. (a) Describe the procedure of cutting threads on a solid cylindrical shaft using a lathe. Also, write the role of change gear mechanism in the above process?

Or

- (b) With a suitable sketch, explain the principal parts of a Capstan lathe.

13. (a) With a neat sketch, illustrate how external and internal keyways can be cut in a shaping machine. (6+7)

Or

- (b) Describe in detail about the following milling cutters: (4+4+5)

(i) plain milling cutter

(ii) angle milling cutter and

(iii) end mill cutter

14. (a) With a neat sketch, elaborate on the construction and working of a horizontal spindle surface grinder.

Or

- (b) Illustrate the construction and working of a vertical broaching machine with a neat sketch.

15. (a) Demonstrate the construction and working of any one type of automatic tool changing (ATC) mechanism used in a CNC machining centre.

Or

- (b) With a neat sketch, explain the construction and working of a recirculating ball screw mechanism. (3+10)

PART C — (1 × 15 = 15 marks)

16. (a) With a neat sketch, Discuss the process of generating a spur gear shown in Fig.16 (a) by Gear Hobbing process.

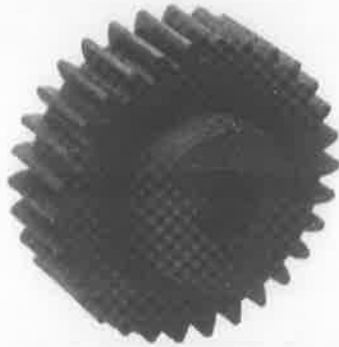


Fig.16 (a) Spur gear

Or

- (b) The component shown in Fig.16 (b) has to be machined in a CNC vertical machining center which has a FANUC controller. Write a program to machine the part assuming appropriate data. The raw material is a rectangular block of size 80 mm (width) × 100 mm (length) × 5 mm (thickness).

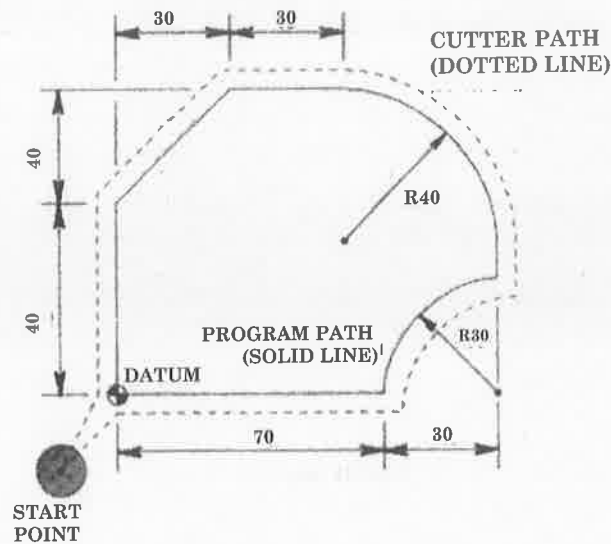


Fig.16 (b) Component

