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Question Paper Code : 41380

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2024.

Third/Fourth Semester

Mechanical Engineering

ME 3493 — MANUFACTURING TECHNOLOGY

(Common to Mechanical Engineering (Sandwich)/Mechanical and Automation Engineering/Mechatronics Engineering/Robotics and Automation)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Compare orthogonal and oblique cutting.
2. What are the factors responsible for built-up edge in cutting tools?
3. Write down the formula for calculating taper turning angle by compound rest method.
4. What are the functions of feed rod and lead screw?
5. What is the difference between up milling and down milling?
6. What is the need of truing and dressing operations in a grinding wheel?
7. State the limitations of CNC machine tools.
8. Mention the type of ball screws.
9. What is a canned cycle?
10. What is a preparatory function? How is it important in CNC programming?

PART B — (5 × 13 = 65 marks)

11. (a) What is a chip breaker? Describe the different types of chips produced during metal machining with neat sketches.

Or

- (b) (i) State the parameters that influence the life of tool and discuss. (6)
(ii) Explain the geometry of a single point cutting tool with suitable sketches. (7)

12. (a) (i) Describe the turret indexing mechanism. (6)
(ii) Discuss about the bar feed mechanism. (7)

Or

- (b) (i) Discuss the features of ram type and saddle type Turret. (9)
(ii) What is meant by "Tool layout" of a Turret lathe? (4)

13. (a) (i) Explain various milling cutters with neat sketches? (7)
(ii) How will you cut the following types of surfaces on milling machines?
(1) Flat surfaces
(2) Slots and splines. (6)

Or

- (b) (i) Describe gear cutting by forming and shaping. (8)
(ii) Give the specification of grinding wheel. (5)

14. (a) (i) Narrate the design considerations of CNC machines. (6)
(ii) Discuss about slide ways used in CNC machine tools. (7)

Or

- (b) With a block diagram, explain the various sub-systems and functions of a modern CNC controller.

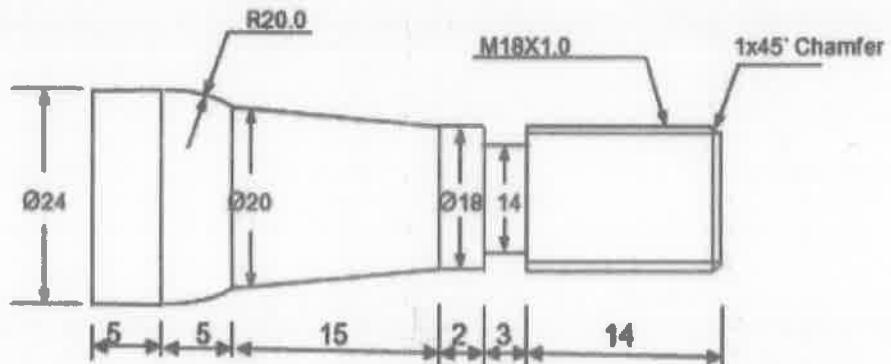
15. (a) Explain the following in CNC machining :
(i) Linear interpolation (4)
(ii) Circular interpolation (4)
(iii) Cubic interpolation. (5)

Or

- (b) (i) What are the different types of contouring system in a CNC machine? Explain with neat sketches. (7)
(ii) Explain various types of input devices used in modern CNC controller for loading programs. (6)

PART C — (1 × 15 = 15 marks)

16. (a) Write a part program for the component shown in Fig. 16 (a)

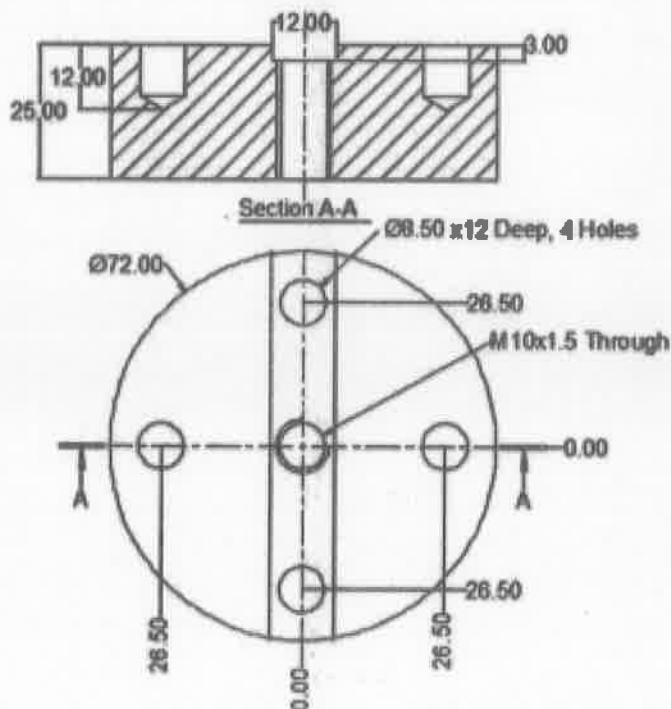


CNC turning

Fig. 16(a)

Or

- (b) Write a part program for the component shown in Fig. 16 (b)



CNC Milling

Fig. 16 (b)