

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Question Paper Code : 40916

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 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 various parts of single point cutting tool.
2. What is chip thickness ratio?
3. List any two special attachments in lathe.
4. Mention the use of chucks in lathe.
5. Compare automatic and semi automatic lathe.
6. Write down any four operations performed by shaper.
7. What is meant by centerless grinding?
8. Write any two physical properties of aluminium oxide in grinding machine.
9. State any two advantages of NC machines.
10. List the methods of creating part programming.

PART B — (5 × 13 = 65 marks)

11. (a) If the relationship for H.S.S tools is $VT^{1/8} = C_1$ and for tungsten carbide tool is $VT^{1/5} = C_2$. Assume a speed of 25m/min and tool life of 3 hours for both the tools. Compare their cutting lives at 32m/min.

Or

- (b) A 100 mm diameter bar is turned by means of a tool for which $\phi = 90^\circ$ and $\alpha = 15^\circ$. The depth of cut is 5 mm and the feed is 0.25 mm/rev. If the mean length of a cut chip representing one rotation of the work piece is 92 mm, find the shear plane angle?

12. (a) (i) Classify lathe machines (5)
(ii) Explain the working of swiss type automatic screw machine with sketch. (8)

Or

- (b) Describe a semiautomatic spindle lathe machine with sketch.

13. (a) Explain the principal parts and angles of a plain milling cutter with sketch.

Or

- (b) (i) Explain the principle of operation of gear hobbing operation. (7)
(ii) What are the advantages of gear hobbing? (6)

14. (a) Explain the external cylindrical grinding process and surface grinding process. (13)

Or

- (b) Compare pull broach and push broach. List its advantages and limitations. (13)

15. (a) Explain wafer machining. List its advantages over other machining process. (13)

Or

- (b) Explain open loop and closed loop systems.

PART C — (1 × 15 = 15 marks)

16. (a) In an orthogonal turning operation, the following data were obtained.

Chip thickness = 0.5 mm

Width of cut = 2 mm

Feed = 0.2 mm/rev

Cutting force = 1200 N

Thrust force = 280 N

Cutting speed = 60 m/min

Rake angle = 12°

Calculate the following :

- (i) Chip thickness ratio (3)
- (ii) Shear angle (3)
- (iii) Velocity of chip along tool force (3)
- (iv) Friction force along tool force (3)
- (v) Specific power (3)

Or

- (b) A shaper is operated at 130 cutting strokes per minute and is used to machine a work piece of 300 mm in length and 122 mm in width. Use a feed of 0.7 mm per stroke and a depth of cut of 5 mm. Calculate the total machining time for machining the component. The forward stroke is completed in 220° . Calculate the percentage of the time when the tool is not contacting the workpiece.
-

