Total No. of Questions: 20

Enrollment No : _____

MEDICAPS UNIVERSITY

Faculty of Engineering

End Semester Examination May 2025

ME3CO45 / ME3CO25 Manufacturing Processes -II

Programme	:	B.Tech.	**Branch/Specialisation**	:	ME
Duration	:	3 hours	**Maximum Marks**	:	60

Note: *All questions are compulsory. Internal choices, if any, are indicated. Assume suitable data if necessary. Notations and symbols have their usual meaning.*

Section 1 (Answer all question(s))

Q1. Which type of cutting involves the cutting edge being perpendicular to the direction of motion? **Marks: 1 CO: 1 BL: 1**

Rubric	Marks
Orthogonal cutting	1

- ○ Oblique cutting
- ◉ Orthogonal cutting
- ○ Shear cutting
- ○ Continuous cutting

Q2. Merchant's force circle diagram is used to analyze- **Marks: 1 CO: 1 BL: 1**

Rubric	Marks
Cutting forces	1

- ○ Tool wear
- ○ Cutting tool material selection
- ◉ Cutting forces
- ○ Heat dissipation

Q3. Which Lathe operation is used to produce cylindrical surfaces? **Marks: 1 CO: 2 BL: 2**

Rubric	Marks
Turning	1

- ◉ Turning
- ○ Facing
- ○ Knurling
- ○ Boring

Q4. What is the purpose of a quick return mechanism in a shaper machine? **Marks: 1 CO: 2 BL: 2**

Rubric	Marks
Reducing idle stroke time	1

- ○ Reducing tool wear
- ○ Increasing machining speed
- ◉ Reducing idle stroke time
- ○ Improving surface finish

Q5. Which Milling operation is performed with the cutter rotating against the feed direction? **Marks: 1 CO: 3 BL: 2**

Rubric	Marks
Up milling	1

- ◉ Up milling
- ○ Down milling
- ○ Face milling
- ○ End milling

Q6. What is the purpose of a Broaching machine? 1 3 1

Rubric	Marks
Producing keyways, splines, and holes	1

- ○ Grinding surfaces
- ◉ Producing keyways, splines, and holes
- ○ Drilling cylindrical holes
- ○ Threading bolts

Q7. Which of the following is an abrasive machining process? 1 4 2

Rubric	Marks
Grinding	1

- ○ Turning
- ○ Milling
- ○ Drilling
- ◉ Grinding

Q8. Which process is used for internal surface finishing? 1 4 1

Rubric	Marks
Honing	1

- ○ Lapping
- ◉ Honing
- ○ Grinding
- ○ Shaping

Q9. Which of the following is a non-traditional machining process? 1 5 1

Rubric	Marks
Electrical Discharge Machining	1

- ○ Turning
- ○ Milling
- ◉ Electrical Discharge Machining
- ○ Drilling

Q10. What is the primary advantage of Electrochemical Machining? 1 5 1

Rubric	Marks
No mechanical contact between tool and workpiece	1

- ○ High tool wear
- ◉ No mechanical contact between tool and workpiece
- ○ High cutting force
- ○ Requires frequent tool sharpening

Section 2 (Answer all question(s))

Q11. Define machinability and its importance in metal cutting. Marks CO BL 2 1 2

Rubric	Marks
Definition - 1 mark Importance - 1 mark	2

Q12. (a) Discuss different types of chips formed during metal cutting. Explain how cutting conditions influence chip formation. **8 1 2**

Rubric	Marks
Concept of chips formation - 2 marks Types of Chips - 3 marks Influence of Cutting Conditions - 3 marks	8

(OR)

(b) Explain the Merchant's force circle diagram and derive the relationship between cutting forces.

Rubric	Marks
Diagram Explanation - 4 marks Derivation of Force Relationship - 4 marks	8

Section 3 (Answer all question(s))

Q13. Name the eight different operations performed on a Lathe. **Marks CO BL: 2 2 1**

Rubric	Marks
Lathe operations (minimum eight) - 2 marks	2

Q14. (a) Describe the main components and accessories of a lathe machine. How do they contribute to different machining operations? **8 2 2**

Rubric	Marks
Main Components – Explanation of at least four key components - 3 marks Accessories – Description of essential accessories - 3 marks Contribution to Machining Operations - 2 marks	8

(OR)

(b) Explain the working principle & key components of a shaper machine.

Rubric	Marks
Working Principle - 4 marks Description of Key Components - 4 marks	8

Section 4 (Answer all question(s))

Q15. Define broaching and explain its principle. **Marks CO BL: 2 3 2**

Rubric	Marks
Definition - 1 mark Principle - 1 mark	2

Q16. (a) Differentiate between up-milling and down-milling with neat sketches. Discuss their advantages and disadvantages. **8 3 2**

Rubric	Marks
Difference - 4 marks Advantages & Disadvantages - 4 marks	8

(OR)

(b) Describe the construction and working of a universal drilling machine. How does it differ from a radial drilling machine?

Rubric	Marks
Construction and Working - 4 marks Difference - 4 marks	8

Section 5 (Answer all question(s))

Marks CO BL

Q17. Define surface grinding and mention one of its industrial applications. **2 4 2**

Rubric	Marks
Definition - 1 mark Application - 1 mark	2

Q18. (a) Explain the specifications of grinding wheels. Describe the factors to be considered while selecting a grinding wheel. **8 4 2**

Rubric	Marks
Explanation related to specifications of grinding wheels - 4 marks Factors to be considered for selection of grinding wheels - 4 marks	8

(OR)

(b) Explain the honing process with a neat sketch. How does it improve surface finish and dimensional accuracy?

Rubric	Marks
Description of honing process and sketch - 4 marks Improvement in Surface Finish - 2 marks Improvement in Dimensional Accuracy - 2 marks	8

Section 6 (Answer all question(s))

Marks CO BL

Q19. Explain G-code and M-code used in CNC programming. **2 5 2**

Rubric	Marks
Significance of G-code - 1 marks Significance of M-code - 1 marks	2

Q20. (a) How does Water Jet Machining (WJM) differ from Abrasive Jet Machining (AJM)? Explain their applications in industrial cutting. **8 5 2**

Rubric	Marks
Difference (minimum 5) - 5 marks Applications - 3 marks	8

(OR)

(b) Describe the working of Electrochemical Machining (ECM). Explain its advantages over conventional machining.

Rubric	Marks
Working - 5 marks Advantages - 3 marks	8

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