

GUJARAT TECHNOLOGICAL UNIVERSITY

BE-4 SEMESTER – OLD PAPER – S22 TO W25 – QUESTION BANK

Subject Name & Code: Manufacturing Processes (3141908)

Chapter 1 – Basic Machine Tools and Metal Cutting Principles

Repeated Questions:

1. **Give the detailed classification of machine tools.**
 - Appeared in: S25 (Q1a, 03 marks), W23 (Q1a, 03 marks), W22 (Q1a, 03 marks), S24 (Q1a, 03 marks)
 2. **Describe the working/primary and auxiliary/secondary motions in machine tools.**
 - Appeared in: S25 (Q1b, 04 marks), W25 (Q1a, 03 marks), W24 (Q1b, 04 marks), W23 (Q1b, 04 marks), W22 (Q1b, 04 marks), S22 (Q1b, 04 marks)
 3. **Illustrate single-point cutting tool geometry and tool signature with sketch.**
 - Appeared in: S25 (Q1c, 07 marks), W25 (Q1c, 07 marks), W24 (Q1c, 07 marks), W23 (Q1c, 07 marks), W22 (Q1c, 07 marks)
 4. **Draw single-point cutting tool and explain tool signature as per ASA.**
 - Appeared in: S24 (Q1c, 07 marks), S23 (Q1c, 07 marks)
 5. **Differentiate between orthogonal and oblique cutting.**
 - Appeared in: S23 (Q2a, 03 marks), W24 (Q2a, 03 marks)
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Other Important Questions:

1. **Explain primary motion and secondary motion in centre lathe.**
 - Appeared in: S23 (Q1a, 03 marks), W24 (Q1a, 03 marks)
 2. **Define Machine tool along with its classification.**
 - Appeared in: W25 (Q1b, 03 marks)
 3. **Explain any six operations carried out on lathe machine.**
 - Appeared in: S24 (Q1b, 04 marks), W22 (Q2b, 04 marks)
 4. **Why cutting forces are measured? What are the different ways to measure cutting forces?**
 - Appeared in: S24 (Q2b, 04 marks)
 5. **What are the basic requirements of the machining processes?**
 - Appeared in: W24 (Q1b, 04 marks)
 6. **Explain with diagram: working and auxiliary motions in machine tools.**
 - Appeared in: W22 (Q1b, 04 marks)
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Chapter 2 – Metal Cutting Lathes

Repeated Questions:

1. **List out operations carried on engine lathe machine tools.**
 - Appeared in: S25 (Q2a, 03 marks)
2. **Explain any eight/six operations carried out on lathe machine.**
 - Appeared in: W25 (Q2b, 04 marks), S24 (Q1b, 04 marks), S22 (Q2c, 07 marks), W23 (Q2c, 07 marks)
3. **What is an alignment test? Describe in detail the alignment process for a lathe machine.**
 - Appeared in: S25 (Q2b, 04 marks), S22 (Q2a, 03 marks), W23 (Q2a, 03 marks), W22 (Q2c, 07 marks)
4. **Describe the construction and key components of an engine lathe.**
 - Appeared in: S25 (Q2c, 07 marks)
5. **Explain how thread cutting is performed on a lathe using gear train and chasing dial.**
 - Appeared in: S25 (Q2c OR, 07 marks), S22 (Q2c OR, 07 marks), W22 (Q3c OR, 07 marks)
6. **List the methods of taper turning on a lathe machine. Describe a method suitable for long jobs.**
 - Appeared in: W25 (Q2c, 07 marks), W24 (Q2c, 07 marks), W23 (Q2c, 07 marks)
7. **Differentiate between Capstan and Turret lathe.**
 - Appeared in: S23 (Q3a, 03 marks), S22 (Q2b, 04 marks), W23 (Q2b, 04 marks)

Other Important Questions:

1. **Why is the Lathe machine called the ‘Mother of Machine Tools’?**
 - Appeared in: W25 (Q2a, 03 marks)
 2. **Name the accessories commonly used to enhance lathe operations. Explain different types of mandrels.**
 - Appeared in: W25 (Q2c OR, 07 marks)
 3. **Explain half-nut mechanism with sketch. Also draw facing, parting off operations with usual notations.**
 - Appeared in: S23 (Q2c, 07 marks), W24 (Q2c OR, 07 marks)
 4. **What are the various methods available for taper turning on a centre lathe? Explain with sketch for steep tapers.**
 - Appeared in: S23 (Q2c OR, 07 marks)
 5. **Enlist work holding devices generally used in a lathe machine. Explain any two.**
 - Appeared in: S23 (Q2b, 04 marks), W24 (Q2b, 04 marks)
 6. **How is a lathe specified? Explain with neat sketch.**
 - Appeared in: S23 (Q1b, 04 marks)
 7. **Outline the specifications of Lathe machine.**
 - Appeared in: S22 (Q5a, 03 marks)
 8. **Explain taper turning methods of Lathe machine.**
 - Appeared in: W22 (Q3a OR, 03 marks)
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Chapter 3 – Drilling Machines

Repeated Questions:

1. **Enumerate different types of drilling machines and their particular functions.**
 - Appeared in: S25 (Q3a, 03 marks)
 2. **Explain any four/five operations carried out on radial drilling machine.**
 - Appeared in: S25 (Q3b, 04 marks), S22 (Q3b OR, 04 marks), W22 (Q3b, 04 marks)
 3. **Describe steps involved in performing an alignment test on a drilling machine.**
 - Appeared in: S25 (Q3c, 07 marks)
 4. **Explain radial drilling machine with neat sketch.**
 - Appeared in: S24 (Q3c, 07 marks), S22 (Q3c OR, 07 marks), W25 (Q3b, 04 marks), W24 (Q3c, 07 marks)
 5. **List common operations that can be carried out on drilling machine and explain any three with sketches.**
 - Appeared in: W25 (Q3a, 03 marks)
 6. **Illustrate nomenclature of drill bit with neat sketch.**
 - Appeared in: W25 (Q3c, 07 marks), W24 (Q3c OR, 07 marks)
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Other Important Questions:

1. **Differentiate between drilling and boring operations.**
 - Appeared in: W24 (Q3a, 03 marks), W23 (Q3a, 03 marks)
 2. **What are different tool holding devices of drilling machine? Describe one with sketch.**
 - Appeared in: S23 (Q3b, 04 marks), W24 (Q3b, 04 marks), W25 (Q3b OR, 04 marks)
 3. **Give any four field applications/operations of drilling machine.**
 - Appeared in: W25 (Q3a OR, 03 marks), W24 (Q3a, 03 marks), W23 (Q3a OR, 03 marks)
 4. **Classify drills. Explain nomenclature of twist drill with neat sketch.**
 - Appeared in: W23 (Q3c OR, 07 marks)
 5. **Differentiate between counter boring and counter sinking operations.**
 - Appeared in: W22 (Q3b OR, 04 marks)
 6. **Describe a tapping attachment in drill machine.**
 - Appeared in: S23 (Q3c OR, 07 marks)
 7. **Is it possible to correct an out-of-round hole with a reamer? If yes, specify type.**
 - Appeared in: S23 (Q3a OR, 03 marks)
 8. **In a tap of outside diameter 10mm, pitch 1.5mm, depth of thread $d=0.61p$, what is diameter of nearest drill?**
 - Appeared in: S23 (Q3b OR, 04 marks)
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Chapter 4 – Boring Machines

Repeated Questions:

1. **List functions, advantages, and disadvantages of a boring machine.**
 - Appeared in: S25 (Q3a OR, 03 marks)
2. **Differentiate between drilling machines and boring machines.**
 - Appeared in: S25 (Q3b OR, 04 marks)
3. **Describe horizontal boring machines with neat diagram.**
 - Appeared in: S25 (Q3c OR, 07 marks), W25 (Q3c OR, 07 marks), S22 (Q1c, 07 marks), W22 (Q3c, 07 marks)
4. **Describe various types of operations performed by a vertical boring machine.**
 - Appeared in: S24 (Q3a OR, 03 marks)
5. **List methods/equipment for mounting cutters on horizontal boring machine.**
 - Appeared in: S24 (Q3a, 03 marks)

Other Important Questions:

1. **Explain horizontal boring machine with neat sketch.**
 - Appeared in: W24 (Q3b, 04 marks), W23 (Q3b OR, 04 marks)
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Chapter 5 – Milling Machines

Repeated Questions:

1. **Categorize milling machines according to applications and construction.**
 - Appeared in: S25 (Q4a, 03 marks), S22 (Q3a OR, 03 marks), W25 (Q4a OR, 03 marks), W23 (Q4a OR, 03 marks)
 2. **Describe milling cutters with drawing.**
 - Appeared in: S25 (Q4b, 04 marks), S22 (Q4b, 04 marks), W25 (Q4b, 04 marks)
 3. **Explain any five/six milling operations with neat sketch.**
 - Appeared in: S25 (Q4c, 07 marks), S22 (Q4c OR, 07 marks), W25 (Q4c OR, 07 marks), W22 (Q4b, 04 marks)
 4. **Differentiate between up milling and down milling.**
 - Appeared in: S25 (Q4b OR, 04 marks), S23 (Q4a, 03 marks), S22 (Q4a, 03 marks), W24 (Q4b, 04 marks), W23 (Q4a, 03 marks)
 5. **Explain single indexing and compound indexing in milling machine.**
 - Appeared in: S25 (Q4c OR, 07 marks), W24 (Q4c OR, 07 marks)
 6. **List alignment tests required for milling machine.**
 - Appeared in: W25 (Q4a, 03 marks), W24 (Q4a, 03 marks)
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Other Important Questions:

1. **Write advantages and limitations of broaching.**
 - Appeared in: S25 (Q4a OR, 03 marks), S23 (Q5a, 03 marks), W23 (Q5a, 03 marks)
 2. **Explain gang milling and form milling operations.**
 - Appeared in: S23 (Q4a OR, 03 marks)
 3. **What is indexing? Describe direct indexing with example.**
 - Appeared in: S23 (Q4c, 07 marks), W25 (Q4b, 04 marks), W23 (Q4b, 04 marks)
 4. **Explain alignment test of milling machine with sketch.**
 - Appeared in: S22 (Q4b OR, 04 marks), W23 (Q4b, 04 marks)
 5. **Describe knee and column vertical milling machine with neat sketch.**
 - Appeared in: W25 (Q4c, 07 marks), W24 (Q4c, 07 marks), W22 (Q4c, 07 marks)
 6. **Compare between plain and universal milling machine.**
 - Appeared in: S24 (Q5b, 04 marks)
 7. **Discuss how cutting force changes with variation of speed and angle of milling cutter.**
 - Appeared in: S24 (Q5b OR, 04 marks)
 8. **Explain helical milling operation and its limitations.**
 - Appeared in: S22 (Q4a OR, 03 marks)
 9. **Discuss indexing mechanism of milling machine.**
 - Appeared in: W22 (Q4a OR, 03 marks)
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Chapter 6 – Planers, Shapers and Slotters

Repeated Questions:

1. **Classify planer, shaper, and slotter machine tools.**
 - Appeared in: S25 (Q5a, 03 marks), W25 (Q5a, 03 marks), W22 (Q5a, 03 marks)
2. **Explain crank and slotted link quick return mechanism in shaper machine.**
 - Appeared in: S25 (Q5c, 07 marks), W25 (Q5c, 07 marks), S23 (Q4c OR, 07 marks), W24 (Q5c OR, 07 marks), S22 (Q5c, 07 marks)
3. **Differentiate planner machine and shaper machine.**
 - Appeared in: S24 (Q4b, 04 marks)
4. **Explain whitworth quick return mechanism used in shaper.**
 - Appeared in: S24 (Q4c, 07 marks)
5. **Describe how to cut internal keyway on slotter machine with neat sketch.**
 - Appeared in: W24 (Q5a OR, 03 marks), W23 (Q5a OR, 03 marks)

Other Important Questions:

1. **What are advantages of hydraulic shaper over crank shaper?**
 - Appeared in: S24 (Q4a, 03 marks)
 2. **Define feed, speed, and depth of cut in shaper.**
 - Appeared in: S24 (Q4a OR, 03 marks)
 3. **What operations can be performed efficiently by planer?**
 - Appeared in: S24 (Q4b OR, 04 marks)
 4. **Name and describe various work holding devices in shapers.**
 - Appeared in: S24 (Q4c OR, 07 marks)
 5. **Compare in detail shaper and planer.**
 - Appeared in: S23 (Q4b OR, 04 marks)
 6. **Describe in brief how to machine circular surface in slotting machine.**
 - Appeared in: S24 (Q2a, 03 marks)
 7. **Discuss specifications of planer and shaper machine.**
 - Appeared in: W22 (Q5b, 04 marks)
 8. **Elaborate slotter machine tool with suitable diagram.**
 - Appeared in: S22 (Q3c, 07 marks)
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Chapter 7 – Sawing and Broaching Machines

Repeated Questions:

1. **Write advantages and limitations of broaching.**
 - Appeared in: S25 (Q4a OR, 03 marks), S23 (Q5a, 03 marks), W23 (Q5a, 03 marks)
 2. **What is broaching? How broaches are classified?**
 - Appeared in: S23 (Q5a OR, 03 marks), W24 (Q5a, 03 marks)
 3. **Write short note on band sawing machine.**
 - Appeared in: S25 (Q5c OR, 07 marks)
 4. **What is sawing? List different types of sawing machine.**
 - Appeared in: S24 (Q5a, 03 marks)
 5. **Illustrate reciprocating sawing machine with neat sketch and applications.**
 - Appeared in: W22 (Q5c, 07 marks)
 6. **Sketch different elements of broach and describe them briefly.**
 - Appeared in: S24 (Q5a OR, 03 marks)
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Other Important Questions:

1. **Write classification of sawing machine. Explain any one.**
 - Appeared in: S23 (Q5b OR, 04 marks)
 2. **Sketch and explain reciprocating sawing machine.**
 - Appeared in: S22 (Q3b, 04 marks)
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Chapter 8 – Grinding Machines and Abrasives

Repeated Questions:

1. **How grinding wheel is specified? / Explain Indian standard marking system for grinding wheels.**
 - Appeared in: S25 (Q5a OR, 03 marks), S24 (Q1c, 07 marks), S23 (Q5c, 07 marks), W24 (Q5c, 07 marks), W23 (Q5b, 04 marks)
2. **Explain dressing and truing of grinding wheel.**
 - Appeared in: S25 (Q5b OR, 04 marks), S23 (Q5b, 04 marks), W24 (Q5b, 04 marks), W23 (Q5b OR, 04 marks)
3. **Explain grinding wheel characteristics and wheel selection procedure in detail.**
 - Appeared in: W25 (Q5c OR, 07 marks), W23 (Q5c OR, 07 marks), W22 (Q5c OR, 07 marks)
4. **Explain types of grinding wheel and its selection process.**
 - Appeared in: S22 (Q5b OR, 04 marks), W24 (Q5b OR, 04 marks)

Other Important Questions:

1. **Describe coding of grinding wheel as per ISI.**
 - Appeared in: S25 (Q5a OR, 03 marks), W25 (Q5b, 04 marks)
2. **Define dressing of grinding wheel. Which operation alters shape of grinding wheel?**
 - Appeared in: W25 (Q5a OR, 03 marks)
3. **Explain centerless grinders along with advantages and limitations.**
 - Appeared in: W25 (Q5b OR, 04 marks), W22 (Q5b OR, 04 marks)
4. **Describe cylindrical grinding machine with sketch.**
 - Appeared in: S22 (Q5b, 04 marks)
5. **Illustrate surface grinding machine with neat sketch.**
 - Appeared in: S22 (Q5c OR, 07 marks), W23 (Q5c, 07 marks)
6. **Explain different types of grinding processes.**
 - Appeared in: W22 (Q5a OR, 03 marks)
