

lathe machine practical viva questions Online PDF

Lathe Machine Practical Viva Questions

When preparing for a practical viva on lathe machines, students often seek comprehensive guidance on the most frequently asked questions and the core concepts they need to master. The **lathe machine practical viva questions** encompass a wide range of topics, from basic operations and safety precautions to detailed machining processes and troubleshooting techniques. This article provides an organized and detailed overview of essential questions and answers that can help students excel in their viva examinations and develop a solid understanding of lathe machine operations.

Introduction to Lathe Machines

What is a Lathe Machine?

A lathe machine is a versatile machine tool used primarily for shaping metal or wood by rotating the workpiece against various cutting tools. It is fundamental in manufacturing processes for producing cylindrical, conical, or flat surfaces and is widely used in workshops and industries.

Types of Lathe Machines

Common types include:

- Engine Lathe
- Capstan and Turret Lathe
- Special Purpose Lathes (e.g., tool room lathe, CNC lathe)

Main Parts of a Lathe Machine

Understanding the components is crucial:

- Bed
- Headstock
- Tailstock

- Carriage
- Spindle
- Chuck
- Lead screw
- Feed rod

Basic Operations and Functions

What are the common operations performed on a lathe machine?

Common operations include:

- Turning
- Facing
- Drilling
- Boring
- Thread Cutting
- Parting / Cutting off
- Knurling
- Chamfering

Explain the process of turning operation.

Turning involves removing material from the external surface of a rotating workpiece using a cutting tool. The workpiece is held in a chuck or between centers, and the tool moves parallel to the axis of rotation to produce a cylindrical surface.

What is facing operation?

Facing is the process of producing a flat surface at the end of the workpiece by moving the cutting tool radially across the face of the rotating workpiece.

Tools and Accessories in Lathe Operations

What are the types of cutting tools used in a lathe machine?

Types include:

- High-Speed Steel (HSS) tools

- Carbide tools
- Diamond tools (for specialized operations)

Explain the purpose of a chuck and its types.

A chuck holds the workpiece firmly during machining. Types include:

- Three-jaw chuck (self-centering)
- Four-jaw chuck (independent)
- Collet chuck

What is the function of the tailstock?

The tailstock supports the free end of the workpiece and can hold tools like drills or reamers for operations such as drilling or reaming.

Setting and Adjustments

How do you set the tool for a specific operation?

- Select the appropriate tool based on the operation.
- Mount the tool securely in the tool post.
- Adjust the height to align with the workpiece's center line.
- Set the correct feed and depth of cut using control dials.

How is the workpiece mounted in a lathe machine?

- The workpiece is clamped either in the chuck or between centers.
- For external operations, the workpiece is held in the chuck.
- For internal operations or supporting long workpieces, the tailstock is used.

Safety Precautions and Troubleshooting

What are the safety precautions to follow while operating a lathe machine?

- Wear safety goggles and gloves.
- Ensure the machine is properly grounded.

- Check the workpiece and tools before starting.
- Keep hands away from rotating parts.
- Never leave the machine unattended during operation.
- Use correct speeds and feeds.

Common problems faced during lathe operations and their solutions?

- Reduce feed rate, ensure proper tool sharpness, or tighten mounting.
- **Tool breakage:** Use appropriate cutting speed and feed, and ensure tool is properly secured.
- **Workpiece not rotating:** Check the chuck and spindle connection.
- **Surface finish issues:** Use a sharper tool, reduce cutting speed, or increase tool clearance angle.

Special Machining Processes

Explain thread cutting on a lathe machine.

Thread cutting involves using the lathe to produce screw threads. It requires:

- Setting the correct gear ratios for the desired thread pitch.
- Engaging the lead screw with the carriage movement.
- Using a suitable cutting tool and correct depth of cut.

What is drilling in lathe operations?

Drilling is performed by mounting a drill bit in the tailstock or chuck and creating holes in the workpiece. The workpiece is held stationary while the rotating drill bit cuts into it.

Describe the process of boring.

Boring enlarges or finishes an existing hole. It uses a single-point cutting tool mounted in the tool post, and the workpiece is rotated while the tool moves inward.

Advanced and Practical Viva Questions

How do you select the cutting speed and feed for different materials?

Selection depends on:

- Material of the workpiece (e.g., steel, cast iron, aluminum)
- Type of cutting operation
- Tool material and condition
- Depth of cut and desired surface finish

Explain the process of taper turning on a lathe.

Taper turning produces a conical surface. Methods include:

- Using a taper attachment
- Setting over the tailstock
- Using a form tool

What are the advantages of CNC lathe machines over conventional lathes?

- High precision and repeatability
- Automation reduces manual effort
- Complex geometries can be machined easily
- Faster production times

Conclusion

Preparing for a lathe machine practical viva involves understanding fundamental concepts, operational procedures, safety measures, and troubleshooting techniques. Reviewing common questions and practicing practical skills will boost confidence and performance during examinations. Remember, mastery of the theoretical and practical aspects of lathe operations is crucial for a successful career in manufacturing, mechanical engineering, and related fields. Regular practice, coupled with a thorough understanding of each component and process, will ensure you excel in your viva and become proficient in lathe machine operations.

Lathe Machine Practical Viva Questions: A Comprehensive Guide for Students and Beginners

The lathe machine practical viva questions are an essential part of technical education in machining and manufacturing trades. As one of the most fundamental machine tools in workshops, the lathe is used extensively for shaping, cutting, drilling, and finishing various materials, primarily metals. Preparing for the viva involves understanding both the theoretical concepts and practical applications of the lathe machine, as well as being able to answer common questions confidently. This guide aims to provide a detailed overview of typical viva questions, their answers, and tips for effective preparation, ensuring that students can approach their viva with clarity and confidence.

Understanding the Basics of Lathe Machines

Before delving into specific viva questions, it is crucial to grasp the fundamental concepts surrounding lathe machines, including their parts, functions, and operations.

What is a Lathe Machine?

A lathe machine is a machine tool used primarily for shaping objects by rotating the workpiece against a cutting tool. It is often referred to as the "mother of all machine tools" because many machining processes are performed on it. Its primary purpose is to produce objects with rotational symmetry, such as cylinders, cones, and threads.

Main Parts of a Lathe Machine

Understanding the parts of a lathe machine is vital for both practical operation and viva questions. The main components include:

- Bed: The base of the lathe that supports all other parts.
- Headstock: Contains the motor and the gear system to drive the spindle.
- Tailstock: Used to support the workpiece or hold tools like drills.
- Carriage: Moves along the bed and carries the cutting tool.
- Saddle: Supports the carriage and allows lateral movement.
- Cross-slide: Allows movement of the tool perpendicular to the spindle axis.
- Tool post: Holds the cutting tool securely.
- Spindle: Rotates the workpiece.
- Lead screw and feed rod: Used for automatic movement of the carriage.

Common Practical Viva Questions and Their Answers

- What are the different types of lathes?

Answer: The main types include:

- Engine Lathe: The most common type used in workshops.
- Capstan and Turret Lathe: Designed for high-volume production with multiple tools.
- Tool Room Lathe: Used for precision work and tool manufacturing.
- Special Purpose Lathes: Such as screw-cutting lathe, automatic lathe, and CNC lathe.

- Name the parts of a lathe machine and explain their functions.

Answer: As listed earlier, parts include the bed, headstock, tailstock, carriage, saddle, cross-slide, tool post, spindle, lead screw, and feed rod. Their functions are:

- Bed: Provides stability and alignment.
- Headstock: Holds the spindle and gear system.
- Tailstock: Supports the workpiece or tools.
- Carriage: Moves the tool along the length of the workpiece.
- Saddle: Supports the carriage.
- Cross-slide: Moves the tool perpendicular to the workpiece.
- Tool post: Holds the cutting tool.
- Spindle: Rotates the workpiece.
- Lead screw/Feed rod: Facilitates automated movement of the carriage and cross-slide.

- What are the different types of cutting tools used in a lathe?

Answer: Common types include:

- High-Speed Steel (HSS) tools
- Carbide tools
- Diamond-tipped tools
- Cermet tools

The choice depends on the material being machined and the desired finish.

- Explain the process of turning on a lathe.

Answer: Turning involves rotating the workpiece against a stationary cutting tool to reduce its diameter or length. The process includes:

- Mounting the workpiece securely in the chuck.
- Selecting the appropriate cutting tool and setting it on the tool post.
- Adjusting the speed (RPM) based on material.
- Moving the carriage along the bed to cut the desired length.
- Using the feed to control the depth and surface finish.

- Stopping the machine after achieving the desired dimensions.
- How do you select the appropriate speed and feed rate?

Answer: Selection depends on:

- Material being machined (softer materials require higher speeds).
- Tool material.
- Depth of cut.
- Surface finish required.
- Manufacturer's recommendations.

Typically, charts are used to determine optimal parameters.

Important Practical Concepts and Techniques

Setting Up the Lathe Machine

- Ensure the machine is clean and properly lubricated.
- Check and tighten all fastenings.
- Mount the workpiece securely in the chuck.
- Select the proper cutting tool and fix it firmly in the tool post.
- Adjust the tool to the correct height (usually at the center height).
- Set the spindle speed and feed according to the work material.

Performing Basic Operations

- Plain turning: Reducing diameter.
- Taper turning: Creating conical shapes.
- Thread cutting: Using screw-cutting gears.
- Parting: Cutting off the workpiece.
- Drilling: Using the tailstock with a drill bit.
- Knurling: Creating textured patterns on the surface.

Safety Precautions

- Always wear safety goggles.
- Ensure guards are in position.
- Do not wear loose clothing or jewelry.
- Turn off the machine before making adjustments.
- Use proper tools and techniques.

Common Viva Questions Related to Practical Skills

- How do you set the tool to cut a specific diameter?

Answer: Use a vernier caliper or micrometer to measure the workpiece. Adjust the tool height to the center of the workpiece. Make a trial cut and measure again until the desired diameter is achieved.

- How do you cut threads on a lathe?

Answer:

- Select the appropriate gear ratio on the gear box for the desired thread pitch.
- Mount the threading tool.
- Engage the half-nut lever to synchronize the carriage movement with the spindle rotation.
- Use the lead screw to produce consistent threads.
- Ensure proper speed and feed rates.

- What is the purpose of the tailstock?

Answer:

- To support long workpieces.
- To hold tools like drills for drilling operations.
- To facilitate the turning of long shafts without deflection.

- How do you perform taper turning?

Answer:

- Use a taper attachment if available.
- Or, set the carriage at an angle manually and move it along the bed while rotating the workpiece.
- Or, use a jig or guide to produce the desired taper.

Tips for Excelling in the Lathe Machine Practical Viva

- Understand the theory thoroughly: Know the parts, operations, and safety procedures.
- Practice regularly: Hands-on experience helps in understanding practical nuances.
- Prepare diagrams: Be able to draw and label machine parts.
- Revise common questions: Prepare answers for standard viva questions.
- Observe safety protocols: Demonstrate safe working habits confidently.
- Stay calm and systematic: Answer questions logically and clearly.

Conclusion

Mastering the lathe machine practical viva questions requires a blend of theoretical knowledge and practical skill. By understanding the machine's parts, operations, safety measures, and common questions, students can approach their viva with confidence. Remember, consistent practice and thorough preparation are key to excelling in both the practical and viva assessments. Whether you are a student beginning your machining journey or a professional honing your skills, a solid grasp of these concepts will serve as a strong foundation for all your machining endeavors.

Question What are the main parts of a lathe machine and their functions? The main parts of a lathe machine include the bed (provides support), headstock (houses the motor and spindle), tailstock (supports the other end of the workpiece), carriage (holds the tool post and moves the tool), and the lead screw (used for threading). Each part plays a vital role in ensuring precise machining operations. **Answer** How do you perform a facing operation on a lathe machine? To perform a facing operation, first secure the workpiece in the chuck, align it properly, and set the tool at the correct height. Then, move the carriage towards the workpiece and feed the tool radially across the face of the workpiece while rotating the spindle, creating a smooth, flat surface. What is the purpose of manually adjusting the speed of the lathe machine? Manual speed adjustment allows the operator to select an appropriate spindle speed based on the material and cutting operation. Proper speed ensures good surface finish, prevents tool wear, and avoids workpiece damage or vibration. Explain the difference between rough turning and finishing turning in lathe operations. Rough turning involves removing large amounts of material quickly to shape the workpiece roughly to the desired size, often with higher feed rates and lower surface finish requirements. Finishing turning is performed after roughing to produce a smooth surface, using finer feeds and slower speeds for better surface quality. What safety precautions should be taken while operating a lathe machine? Operators should wear safety goggles and avoid loose clothing or jewelry, secure all tools and

workpieces properly, keep the work area clean, and ensure the machine guard is in place. Additionally, they should turn off the machine before making adjustments and be cautious of rotating parts to prevent injuries.

Related keywords: lathe machine questions, lathe operations, machining viva questions, lathe machine parts, turning process, cutting tools, machine setup questions, safety precautions, workpiece mounting, troubleshooting lathe issues

machine tools viva questions

machine tools viva questions are an essential part of technical examinations and interviews for students and professionals in machining, manufacturing, and mechanical engineering fields. Preparing for viva voce on machine tools involves understanding fundamental concepts, types, operations, and troubleshooting techniques associated with various machine tools. This comprehensive guide aims to equip you with a detailed collection of important machine tools viva questions, answers, and tips to excel in your assessments. Whether you're a student preparing for exams or a professional brushing up your knowledge, this article will serve as a valuable resource to enhance your understanding of machine tools.

Understanding Machine Tools: An Introduction

Machine tools are power-driven devices used to shape, cut, and form materials?primarily metals?by removing excess material to achieve the desired dimensions and surface finish. They are fundamental to manufacturing industries and form the backbone of mechanical fabrication.

Key Points about Machine Tools:

- They convert mechanical energy into controlled cutting forces.
- They facilitate mass production of parts with precision and efficiency.
- They come in various types designed for specific operations like drilling, milling, turning, grinding, etc.

Commonly Asked Viva Questions on Machine Tools

Preparing for viva questions involves understanding common queries related to types, operations, parts, and working principles of different machine tools.

1. What are machine tools?

Answer:

Machine tools are mechanical devices used to manufacture parts by removing material from a workpiece through cutting, shaping, or forming processes. They provide the necessary power, motion, and precision required for manufacturing.

2. List the different types of machine tools.

Answer:

The main types of machine tools include:

- Lathe machines
- Drilling machines
- Milling machines
- Shaping machines
- Planer machines
- Grinding machines
- Universal machine tools
- Special purpose machine tools

3. What is the function of a lathe machine?

Answer:

A lathe machine is used to rotate the workpiece against a cutting tool to perform operations such as turning, facing, taper turning, knurling, and threading.

4. Explain the working principle of a drilling machine.

Answer:

A drilling machine operates by rotating a drill bit against a stationary workpiece to create holes. The spindle rotates the drill, and the feed mechanism advances the drill into the material.

5. What are the main parts of a milling machine?

Answer:

Main parts include:

- Base
- Column
- Table
- Saddle
- Knee
- Spindle
- Arbor

6. Differentiate between a shaping machine and a slotting machine.

Answer:

- A shaping machine performs reciprocating motion of the tool to cut the workpiece, mainly for flat surfaces.
- A slotting machine performs vertical reciprocating motion to cut keyways or slots in a workpiece.

7. What are the advantages of a CNC machine over conventional machine tools?

Answer:

Advantages include:

- Higher precision and accuracy
- Automation and reduced manual intervention
- Faster production rates
- Complex shape machining
- Easier programming and flexibility

8. Describe the difference between a planer and a shaper machine.

Answer:

- A planer machine is used for machining large workpieces and provides a larger worktable that moves relative to the tool.

- A shaper machine is used for smaller workpieces, with the cutting tool reciprocating over the stationary workpiece.

9. What are the different types of grinding machines?

Answer:

Types include:

- Surface grinding machine
- Cylindrical grinding machine
- Internal grinding machine
- Centreless grinding machine

10. What are the safety precautions to be followed while operating machine tools?

Answer:

- Wear appropriate personal protective equipment (PPE)
- Ensure machine guards are in place
- Keep the work area clean
- Do not operate machinery when tired or distracted
- Follow proper startup and shutdown procedures

Detailed Explanation of Key Machine Tools and Their Viva Questions

Lathe Machine

Q: What is a lathe machine, and what are its main parts?

A:

A lathe machine is used for rotating a workpiece against a stationary cutting tool to remove material. It is essential in manufacturing cylindrical parts. Main parts include:

- Bed: Provides the base and supports other components.
- Headstock: Contains the motor and spindle.

- Tailstock: Supports the other end of the workpiece.
- Carriage: Moves the cutting tool along the workpiece.
- Cross slide and tool post: Hold and position the cutting tool.

Q: What are the different operations performed on a lathe?

A:

- Turning
- Facing
- Taper turning
- Thread cutting
- Knurling
- Drilling (with a drill chuck mounted on the tailstock)
- Boring

Milling Machine

Q: What are the types of milling machines?

A:

- Horizontal milling machine
- Vertical milling machine
- Universal milling machine
- Ram-type milling machine

Q: What is the purpose of a dividing head in milling?

A:

A dividing head is used to rotate the workpiece at precise angles for operations like gear cutting, slotting, or creating complex shapes.

Drilling Machine

Q: What are the different types of drilling machines?

A:

- Pillar drilling machine
- Radial drilling machine
- Sensitive drilling machine
- Deep hole drilling machine

Q: How does a radial drilling machine differ from a pillar drilling machine?

A:

A radial drilling machine has a movable arm allowing the drill head to move horizontally over a workpiece, suitable for large workpieces. A pillar drill has a fixed column and is suitable for smaller workpieces.

Grinding Machines

Q: What are the applications of grinding machines?

A:

Grinding machines are used for finishing operations, achieving high surface quality, tight tolerances, and sharpening cutting tools.

Q: What are the different types of grinding wheels?

A:

- Straight wheel
- Cylindrical wheel
- Dish wheel
- Segmental wheel
- Diamond wheel

Common Troubleshooting and Maintenance Viva Questions

Q: What are common problems faced during machine tool operation?

A:

- Excessive vibration

- Poor surface finish
- Tool wear
- Workpiece misalignment
- Overheating

Q: How can you prevent tool wear in machine tools?

A:

- Use appropriate cutting speeds and feeds
- Regularly inspect and replace worn tools
- Use proper lubrication and cooling
- Ensure machine alignment

Q: What are the routine maintenance procedures for machine tools?

A:

- Lubrication of moving parts
- Cleaning of chips and debris
- Checking alignment and calibration
- Inspection of electrical connections
- Replacement of worn-out parts

Tips for Preparing for Machine Tools Viva Questions

- Understand the fundamentals: Focus on the working principles, parts, and operations of each machine tool.
- Practice drawing diagrams: Being able to draw and label machine components can be very helpful.
- Learn safety precautions: Be familiar with safety measures to demonstrate awareness.
- Revise key differences: Between types of machine tools and their applications.
- Solve previous question papers: To get an idea of common questions asked.

Conclusion

Mastering machine tools viva questions requires a thorough understanding of various machine types, their parts, working principles, operations, and safety measures. Regular practice, diagram

drawing, and staying updated with recent advancements like CNC technology can significantly improve your confidence and performance. Remember, clear explanations and practical insights often impress examiners and interviewers. Use this comprehensive guide as a reference to prepare effectively and excel in your machine tools viva or technical interview.

Machine Tools Viva Questions: A Comprehensive Guide for Students and Professionals

In the realm of manufacturing and mechanical engineering, machine tools viva questions are an essential part of technical examinations, interviews, and practical assessments. These questions serve as a vital bridge between theoretical knowledge and practical application, testing the understanding of various machine tools, their operations, components, and maintenance procedures. Whether you're a student preparing for your viva, a trainer designing assessment modules, or a professional brushing up on fundamentals, having a well-rounded grasp of common questions and their detailed answers is crucial.

This guide aims to provide an in-depth exploration of machine tools viva questions, covering key topics, frequently asked questions, and detailed explanations to help you excel in your evaluations and deepen your understanding of machine tools.

Understanding Machine Tools: An Overview

Before diving into specific viva questions, it's important to establish a foundational understanding of what machine tools are and their significance in manufacturing.

What are Machine Tools?

Machine tools are power-driven devices used to shape, cut, or form materials, primarily metals, by removing excess material or shaping it into desired forms. They provide the necessary precision, repeatability, and efficiency that manual tools cannot achieve.

Types of Machine Tools

Machine tools can be broadly classified based on their functions:

- Turning Machines (e.g., lathes)
- Drilling Machines
- Milling Machines
- Grinding Machines
- Slotting Machines
- Planing Machines

- Shaping Machines
- Broaching Machines

Each type has specific applications, components, and operational principles, which are often the subject of viva questions.

Common Machine Tools Viva Questions: A Detailed Breakdown

Viva questions typically assess both theoretical concepts and practical knowledge. Below, we categorize the questions into core topics for clarity.

- Basic Concepts and Definitions

Q1: What is a machine tool?

Answer: A machine tool is a power-driven device used to shape or form materials, primarily metals, by removing unwanted material through cutting, drilling, grinding, or shaping processes, to produce parts with precise dimensions and surface finishes.

Q2: What are the main functions of a machine tool?

Answer: The primary functions include cutting, shaping, drilling, grinding, boring, and finishing workpieces to desired sizes, shapes, and surface qualities with high precision and repeatability.

Q3: Name the different types of machine tools and their applications.

Answer:

- Lathe: For turning cylindrical workpieces.
- Milling Machine: For machining complex profiles.
- Drilling Machine: For creating holes.
- Grinding Machine: For finishing surfaces.
- Planing and Shaping Machines: For producing flat surfaces.
- Slotting Machine: For cutting keyways and slots.
- Broaching Machine: For internal and external surface shaping.

- Components and Working Principles

Q4: Describe the main components of a lathe machine.

Answer: Key components include the bed, headstock, tailstock, carriage, saddle, cross-slide, tool post, and feed mechanism.

Q5: Explain the working principle of a drilling machine.

Answer: A drilling machine operates by rotating a drill bit against a workpiece, which is held stationary or moved against the rotating bit. The rotational force and axial feed cause the drill to cut into the material, creating holes.

Q6: What is the purpose of a feed mechanism in machine tools?

Answer: The feed mechanism controls the movement of the cutting tool or workpiece relative to each other, ensuring controlled material removal and surface finish.

- Types and Operations of Machine Tools

Q7: Differentiate between a lathe and a milling machine.

Answer: A lathe primarily works on cylindrical surfaces by rotating the workpiece, while a milling machine uses a rotating cutter to remove material from a stationary workpiece, suitable for machining flat and complex surfaces.

Q8: What are the different types of milling machines?

Answer:

- Horizontal milling machines
- Vertical milling machines
- Universal milling machines
- CNC milling machines

Q9: Describe the operation of a shaper machine.

Answer: A shaper machine uses a single-point cutting tool that reciprocates back and forth across the workpiece to produce flat surfaces, grooves, or slots.

- Tool Holding Devices and Attachments

Q10: What are the common types of tool holders in machine tools?

Answer:

- Lathe tool post
- Milling cutter arbor
- Drill chucks
- Collets
- Tool holders for CNC machines

Q11: Why are attachments used in machine tools?

Answer: Attachments extend the versatility of machine tools, allowing them to perform additional operations such as grinding, boring, or threading without requiring separate machines.

- Machining Parameters and Cutting Data

Q12: What are the main cutting parameters?

Answer:

- Cutting speed
- Feed rate
- Depth of cut
- Width of cut

Q13: How does cutting speed influence machining?

Answer: Higher cutting speeds generally increase material removal rates but can lead to higher tool wear and heat generation. Optimal speeds depend on the material and tool used.

- Types of Machining Processes

Q14: Describe the difference between rough and finish machining.

Answer:

- Rough machining removes large amounts of material quickly with less emphasis on surface finish.
- Finish machining removes minimal material to achieve the desired surface quality and dimensional accuracy.

Q15: What is the purpose of a boring operation?

Answer: Boring enlarges or finishes an existing hole to precise dimensions and improved surface quality.

- Maintenance and Safety in Machine Tools

Q16: What are common safety precautions while operating machine tools?

Answer:

- Wearing appropriate PPE (Personal Protective Equipment)
- Ensuring guards are in place
- Properly securing workpieces
- Regular inspection and maintenance
- Avoiding loose clothing or jewelry

Q17: How do you maintain machine tools?

Answer: Regular lubrication, cleaning, inspection of parts for wear, calibration, and timely replacement of worn components.

Tips for Preparing for Machine Tools Viva Questions

- Understand the fundamentals: Know definitions, classifications, and basic principles thoroughly.
- Study diagrams and sketches: Being able to draw and label machine components is often required.
- Practice practical applications: Understand how to set up and operate different machine tools.
- Revise standard questions: Focus on frequently asked questions and their detailed answers.
- Stay updated with safety standards: Know safety precautions and best practices.

Conclusion

Mastering machine tools viva questions requires a blend of theoretical knowledge and practical understanding. By systematically studying the different types of machine tools, their components, operations, and maintenance procedures, candidates can confidently approach viva exams and real-world applications. Remember, clarity in explanations, neat sketches, and awareness of safety protocols often make a significant difference in viva assessments. Use this comprehensive guide as a reference to build your confidence and solidify your grasp on machine tools, ensuring success in your examinations and professional endeavors.

Question What are machine tools and their primary function? Machine tools are mechanical devices used to shape, cut, or form metal or other materials into desired shapes and sizes. Their primary function is to remove material efficiently and accurately to produce finished parts. Name the different types of machine tools commonly used in manufacturing. Common types include lathe machines, milling machines, drilling machines, grinding machines, shaping machines, and slotting machines. What is the difference between a lathe and a milling machine? A lathe primarily rotates the workpiece to perform operations like turning, facing, and threading, whereas a milling machine uses a rotating cutter to remove material from the workpiece in various directions. What are the main parts of a drilling machine? The main parts include the base, column, spindle, table, drill head, and feed mechanism. Explain the concept of 'feed' in machine tools. Feed refers to the distance the tool advances into the workpiece for each revolution or each stroke, controlling the material removal rate and surface finish. What is the purpose of a coolant or lubricant in machining operations? Coolants and lubricants reduce heat generated during machining, minimize tool wear, improve surface finish, and help in easier chip removal. Define 'precision' and 'accuracy' in the context of machine tools. Precision refers to the repeatability of measurements or operations, while accuracy indicates how close a measurement or produced dimension is to the true or desired value. What safety precautions should be taken while operating machine tools? Operators should wear protective gear, ensure proper machine maintenance, avoid loose clothing, keep the work area clean, and follow standard operating procedures. What are cutting tools and their significance in machine tools? Cutting tools are specialized tools used to remove material from the workpiece. Their design and material significantly influence the efficiency, surface finish, and accuracy of machining operations. Explain the concept of 'clamping' in machine tools. Clamping involves securing the workpiece firmly to the machine to prevent movement during machining, ensuring accuracy, safety, and quality of the final product.

Related keywords: machine tools, manufacturing processes, machining operations, tool selection, cutting parameters, machine setup, maintenance, machining accuracy, CNC machines, tooling materials

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