

Class : 9th

Subject : Computer Science

Chapter : 4 System Troubleshooting

Book Exercise Complete Solved

Punjab Board

1. What is the first step in the systematic process of troubleshooting?

- a) Establish a Theory of Probable Cause
- b) Implement the Solution

✓ c) **Identify Problem**

- d) Document Findings, Actions, and Outcomes

📖 **Explanation:** Troubleshooting always starts by identifying the problem through observation, questioning, or testing.

2. Why is effective troubleshooting important for maintaining systems?

- a) It helps save money on repairs
- b) It prevents the need for professional help
- ✓ c) **It ensures systems operate smoothly and efficiently**
- d) It allows for more frequent system updates

📖 **Explanation:** Smooth and efficient operation of systems is the main goal of troubleshooting.

3. Which step involves coming up with a theory about what might be causing a problem?

- a) Test the Theory to Determine the Cause
- ✓ b) **Establish a Theory of Probable Cause**
- c) Implement the Solution
- d) Verify Full System Functionality

📖 **Explanation:** After identifying the problem, we guess (theorize) the possible cause — that's called establishing a theory.

4. After implementing a solution, what is the next step in the troubleshooting process?

- a) Document Findings, Actions, and Outcomes
- b) Test the Theory to Determine the Cause

✓ c) **Verify Full System Functionality**

d) Establish a Plan of Action to Resolve the Problem

📖 **Explanation:** After applying the solution, we must confirm the system is working as expected.

5. Which of the following is an example of identifying a problem in troubleshooting?

a) Testing a laptop battery by plugging in the power cord

b) Coming up with a plan to replace a laptop battery

✓ c) **Noticing that a laptop does not turn on when the power button is pressed**

d) Writing down that a laptop battery was replaced

📖 **Explanation:** Observation of the issue (laptop not turning on) is how we *identify* a problem.

6. Why is documenting findings, actions, and outcomes important in troubleshooting?

a) It helps solve problems faster

✓ b) **It provides a record for future reference**

c) It allows for more efficient testing

d) It ensures the solution is implemented correctly

📖 **Explanation:** Documentation helps in future troubleshooting and system maintenance by keeping track of what was done.

7. What is the purpose of establishing a plan of action in troubleshooting?

a) To identify the problem

b) To verify full system functionality

c) To determine the cause of the problem

✓ d) **To decide on the steps needed to resolve the issue**

📖 **Explanation:** Planning helps guide the actual repair or fix process logically and efficiently.

8. Why is troubleshooting important in computing systems?

a) It ensures hardware components are always up to date

b) It prevents the need for data backups

✓ c) **It helps keep systems running smoothly and securely**

d) It eliminates the need for software updates

📖 **Explanation:** Regular troubleshooting ensures systems function properly and safely.

9. What does troubleshooting help prevent by quickly identifying and resolving issues?

a) The need for professional help

b) The need for software updates

✓ c) **Downtime and lost productivity**

d) The need for regular maintenance

📖 **Explanation:** Prompt issue resolution helps avoid wasted time and resources.

10. Which of the following is an example of ensuring data integrity through troubleshooting?

✓ a) **Identifying a software bug that causes incorrect database results**

b) Replacing a faulty printer

c) Using a cooling pad to prevent laptop overheating

d) Updating the operating system regularly

📖 **Explanation:** Fixing a bug that affects database output directly protects data integrity.

✓ *Solved Short Questions*

1. What is the first step in the systematic process of troubleshooting, and why is it important?

Answer:

The first step is "**Identify the Problem.**"

It is important because it helps the troubleshooter understand what is not working. Correctly identifying the issue ensures that the right solution can be applied, saving time and effort.

2. After identifying a problem, what is the next step in troubleshooting, and how does it help in resolving the issue?

Answer:

The next step is "**Establish a Theory of Probable Cause.**"

This step helps in guessing what might be causing the problem. It narrows down possible causes so that the correct one can be tested and fixed quickly.

3. Describe the importance of testing a theory during the troubleshooting process. Provide an example.

Answer:

Testing a theory confirms whether the guessed cause is correct. It avoids wasting time on wrong fixes.

Example:

If a computer doesn't turn on, and the theory is that the power cable is loose, testing it by reconnecting the cable will confirm if that's the actual issue.

4. Explain what the "Implement the Solution" step entails in troubleshooting.

Answer:

This step involves applying the chosen fix to solve the problem. For example, replacing a faulty component, updating a driver, or reconnecting a cable — whatever action is needed to resolve the issue.

5. Why is it necessary to verify full system functionality after implementing a solution?

Answer:

This step ensures that the system is working properly again and that the problem has not caused any other issues. It confirms the solution is complete and effective.

Long Questions (Detailed Answers)

1. Discuss the importance of troubleshooting in maintaining the smooth operation of systems, especially computing systems.

Answer:

Troubleshooting is a structured method of identifying, diagnosing, and solving technical problems. In computing systems, it plays a vital role in:

- **◆ Ensuring Smooth Operation:** It helps fix issues quickly, preventing system crashes and keeping devices functional.
 - **◆ Minimizing Downtime:** Quick detection and resolution of errors reduce work delays and increase productivity.
 - **◆ Improving Efficiency:** Systems work at optimal speed and performance when errors are removed.
 - **◆ Data Protection:** By identifying risks, troubleshooting helps in protecting sensitive data from corruption or loss.
 - **◆ Cost Saving:** Early detection of issues prevents costly repairs and professional maintenance.
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2. Explain the systematic process of troubleshooting. Describe each step in detail.

Answer:

The troubleshooting process follows these 7 systematic steps:

1. **Identify the Problem:**
Gather information from the user, error messages, and system behavior. Observe symptoms.
2. **Establish a Theory of Probable Cause:**
Based on information, guess what might be wrong. List possible causes.
3. **Test the Theory:**
Apply small fixes or tests to confirm the actual cause. This may include hardware checks or software diagnosis.
4. **Establish a Plan of Action:**
Create a step-by-step plan to fix the issue without causing additional problems.
5. **Implement the Solution:**
Apply the solution identified in the plan — this may involve replacing hardware, reinstalling software, or changing settings.
6. **Verify Full System Functionality:**
Ensure the system works properly after the solution. Test all affected components.
7. **Document Findings, Actions, and Outcomes:**
Record the problem, how it was fixed, and the final result for future reference.

3. Using a case study where a printer is not printing, explain how you would identify the problem and establish a theory of probable cause.

Answer:

Case Study: A user reports that their printer is connected but not printing.

1. **Identify the Problem:**
 - Ask questions: Is it connected? Is it powered on? Any error lights?
 - Check cables and connections.
 - Look for software or driver alerts.
2. **Establish Theory of Probable Cause:**
Possible causes include:
 - Printer offline or paused
 - Driver not installed or corrupted
 - Out of ink or paper
 - Cable unplugged
 - Print spooler service stopped
3. **Testing Theory:**
 - Reconnect cables
 - Reinstall printer driver
 - Check ink and paper levels

- Resume printer if paused
- Restart print spooler service

4. **Conclusion:**

The issue was a paused printer. Resuming the print queue fixed the issue.

4. Discuss the importance of documenting findings, actions, and outcomes during the troubleshooting process.

Answer:

Documentation in troubleshooting is crucial for the following reasons:

- **◆ Future Reference:** Helps in solving similar issues quickly in the future.
 - **◆ Training Purpose:** New staff or students can learn from past cases.
 - **◆ Improved Communication:** Multiple team members can understand what was done and why.
 - **◆ Accountability:** Provides a trail of actions taken and helps identify errors if any.
 - **◆ Efficiency:** Reduces time spent repeating the same process.
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5. Analyze the various ways troubleshooting is vital in computing systems, particularly in preventing downtime, ensuring data integrity, and improving security. Provide specific examples and scenarios to support your analysis.

Answer:

- **✓ Preventing Downtime:**
A failed RAM can crash a system. Troubleshooting helps identify and replace faulty RAM quickly, reducing lost work time.
- **✓ Ensuring Data Integrity:**
A software bug causing incorrect data in a database must be resolved. Troubleshooting locates the bug and applies a patch.
- **✓ Improving Security:**
If a user reports unusual pop-ups, troubleshooting can reveal a malware infection and remove it before data is stolen.

Example Scenario:

In an office, if the network suddenly stops working, identifying and fixing the router issue prevents interruption in communication and task flow.

6. Describe basic software-related troubleshooting strategies, including handling application freezing and unresponsive peripherals.

Answer:

- **Restart Application/System:** First step if software freezes.
 - **Check Task Manager:** Force close unresponsive apps.
 - **Update Software/Drivers:** Bugs in outdated software can cause freezing.
 - **Check for Viruses:** Malware may cause slow or stuck apps.
 - **Reinstall Application:** If the problem persists.
 - **Peripheral Troubleshooting:**
 - Check cable connection
 - Try using the device on another port
 - Reinstall peripheral drivers (e.g., for a printer, keyboard, or mouse)
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7. Explain how to recognize hardware failures, particularly focusing on RAM and hard drive issues.

Answer:

- ✓ **RAM Issues:**
 - Frequent system crashes or reboots
 - Blue Screen of Death (BSOD)
 - Beep codes on startup
 - Applications suddenly closing
 - ✓ **Hard Drive Issues:**
 - Slow boot-up and data access
 - Clicking or grinding sounds
 - File corruption or missing files
 - "Operating System Not Found" message
 - S.M.A.R.T. errors
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8. Elaborate on the importance of maintaining software and addressing security threats.

Answer:

- ◆ **Regular Updates:** Fix bugs and improve performance.
- ◆ **Patch Vulnerabilities:** Protects from security loopholes.
- ◆ **Antivirus/Firewall:** Blocks malicious software and attacks.
- ◆ **Backup Practices:** Prevents data loss in case of threats.
- ◆ **User Awareness:** Helps avoid phishing attacks and unsafe downloads.

9. Describe common methods for identifying and removing malware infections and applying operating system updates for security.

Answer:

Identification:

- Slow system performance
- Unexpected pop-ups or programs
- Disabled antivirus
- Data disappearance

Removal Methods:

- Use antivirus/malware removal tools
- Scan in safe mode
- Reset browser settings
- Uninstall suspicious software

Applying Updates:

- Enable automatic updates
- Manually check for OS patches
- Use update tools for third-party software
- Keep antivirus definitions updated

10. Describe the different data backup methods, including using external storage devices and cloud solutions.

Answer:

- ✓ **External Storage Devices:**
 - USB flash drives, external hard drives
 - Manual or scheduled backups
 - Low cost and offline storage
- ✓ **Cloud Backup Solutions:**
 - Google Drive, Dropbox, OneDrive
 - Accessible from anywhere
 - Automatic syncing and encryption
 - Safer from physical damage
- ✓ **Hybrid Backup:**
 - Combination of external + cloud

- Offers better reliability and redundancy

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