**Khed Taluka Shikshan Prasarak Mandal’s**

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**TYBBA(CA)**

**A**

**Project Report On**

**“Network Troubleshooting Techniques :** **Identifying and Resolving Network Issues”**

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## 1. Proposed Research Topic and Introduction:-

## Network troubleshooting is essential for maintaining smooth communication and data exchange across networks.

## As networks grow in complexity, diagnosing and resolving issues becomes crucial to avoiddowntime and enhance performance.

## This report explores key network troubleshooting techniques, tools, and best practices used inresolving network-related issues.

## 2. Literature Review:-

## Studies in network troubleshooting highlight common issues such as connectivity failures, slownetwork speeds, and security breaches.

## Research discusses the role of diagnostic tools like ping, traceroute, and Wireshark in identifyingroot causes.

## The advancement of AI-driven network monitoring and automated troubleshooting has furtherenhanced problem resolution efficiency.

## 3. Objectives of Study:-

## - To understand the fundamentals of network troubleshooting.

## - To explore common network issues and their causes.

## - To analyze troubleshooting tools and techniques.

## - To examine best practices for proactive network maintenance.

## 4. Area of Study:-

## This study covers various aspects of network troubleshooting, including:-

## Common Issues: Connectivity failures, slow performance, IP conflicts, and DNS issues.

## Troubleshooting Tools: Ping, Traceroute, NSLookup, Wireshark, and SNMP monitoring.

## Methods and Techniques: Layered approach using OSI and TCP/IP models, packet analysis, andlog file examination.

## Best Practices: Regular network monitoring, documentation, and automated alerts.

## 5. Research Methodology:-

## Reviewing literature on network troubleshooting techniques and best practices.

## Comparative analysis of traditional vs. AI-driven troubleshooting approaches.

## Case studies on resolving network outages in enterprises.

## Evaluation of real-time monitoring tools for issue detection and resolution.

## 6. Strengths and Concerns:-

## Strengths:

## Improves network reliability and uptime.

## Enhances security by detecting vulnerabilities.

## Reduces operational costs through efficient issue resolution.

## Supports proactive network maintenance strategies.

## 7.Concerns:-

## Requires skilled personnel for effective troubleshooting.

## Advanced tools can be expensive for small businesses.

## Complexity in diagnosing intermittent network issues.

## Potential security risks when using network monitoring tools.

## 8. References:-

## Cisco Networking Troubleshooting Guide (2023).

## IEEE Research on AI in Network Diagnostics (2024).

## Whitepapers on Proactive Network Monitoring.

## Case Studies on Enterprise Network Issue Resolution.

## This report provides an in-depth analysis of network troubleshooting techniques, ensuring better network performance and reliability.