LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

SMART PHONE TECHNICIAN CUM APP TESTER

Class XI and XII

COUNCIL OF HIGHER SECONDARY EDUCATION, ODISHA
C-2, Prajnapitha, Samantarapur, Bhubaneswar - 751013

CLASS XI – PAPER I (FULL MARKS: 100)

	Units	No. of Theory classes (In Hours)	No. of Practical Classes (In Hours)	Max Marks
Part A	**Employability Skills**			
Unit 1	Communication Skills–I	04	05	10
Unit 2	Self-management Skills–I	03	05	
Unit 3	Entrepreneurial Skills–I	03	05	
	Total (A)	**10**	**15**	**10**
Part B	**Vocational Skills**			
Unit 4	Basic Electrical and Electronics	8	85	40
Unit 5	Active and Passive Components	12		
Unit 6	Analog Electronics	10		
Unit 7	Digital Electronics	5		
Unit 8	Soldering/ De-soldering, SMD & SMT	15		
	Total (B)	**50**	**85**	**40**
Part C	**Practical Work**			
	Practical Examination			20
	Written Test			10
	Viva Voce			10
	Practical Record			10
	Total (C)			**50**
	Grand Total (A+B+C)	**60**	**100**	**100**

CLASS XI – PAPER II (FULL MARKS: 100)

	Units	No. of Theory classes (In Hours)	No. of Practical Classes (In Hours)	Max Marks
Part A	**Employability Skills**			
Unit 1	Information and Communication Technology Skills – I	05	10	10
Unit 2	Green Skills and Sustainability – I	05	05	
	Total (A)	**10**	**15**	**10**
Part B	**Vocational Skills**			
Unit 3	Mobile Technology	17	85	
Unit 4	Introduction to Smartphones	14		
Unit 5	Mobile Security	8		
Unit 6	Mobile App Networking and APIs	6		
Unit 7	Future Trends in Mobile Technology	5		40
	Theory (B)	**50**	**85**	**40**
Part C	**Practical Work**			
	Practical Examination			20
	Written Test			10
	Viva Voce			10
	Practical Record			10
	Total (C)			**50**
	Grand Total (A+B+C)	**60**	**100**	**100**

Question Setting Pattern for Theory Subject for Class XI and XII

Marks: 50 **Time Duration: 2 hrs 30 minutes**

		Each Question Value	No. of questions to answer	Maximum Marks
Part I	10 MCQs (All Questions to be answered)	1	10	10
Part II	Short answer type- approx 50 words. (4 out of 6 questions)	5	4	20
Part III	Long type Answer – 200 to 300 words. (2 out of 4 questions)	10	2	20
			TOTAL MARKS	**50**

CLASS XI - PAPER 1 (THEORY AND PRACTICAL)

Employability Skills:

Unit 1: Communication Skills-I

Theory

- Understanding the Basics of Communication
- Verbal and Non-verbal Communication
- Barriers to Effective Communication
- Listening Skills and Their Importance

Practical

- Introducing Yourself and Others
- Role Play on Daily Communication Scenarios
- Practicing Listening Skills through Audio Clips
- Non-verbal Communication Activities (Body Language, Facial Expressions)
- Group Discussions on Simple Topics

Unit 2: Self-Management Skills-I

Theory

- Understanding Self-Awareness and Personal Goals
- Time Management Techniques
- Stress Management and Emotional Well-being
- Building Self-confidence and Positive Thinking

Practical

- Creating a Personal Development Plan
- Time Management Exercises and Scheduling
- Practicing Relaxation and Mindfulness Techniques
- Self-assessment through SWOT Analysis
- Activities to Boost Self-confidence

Unit 3: Entrepreneurial Skills-I

Theory

- Introduction to Entrepreneurship and Its Importance
- Characteristics and Mindset of an Entrepreneur
- Types of Entrepreneurs and Enterprises
- Role of Entrepreneurs in Economic Development

Practical

- Identifying Local Business Opportunities
- Interaction with Local Entrepreneurs (Guest Sessions/Interviews)
- Preparing a Simple Business Plan
- Market Survey and Product Feedback Collection
- Group Activity: Presenting a Business Idea

Vocational Skills:

PAPER–I (TRADE THEORY-I)

Unit -4

Basic Electrical & Electronics: Overview of basic terms such as electric charge, Potential difference, Voltage, Current, Resistance, Power and Energy. Basics of AC & DC. Voltage source, Constant voltage source, Constant current source, Chassis and ground. Insulator, conductor and semiconductor properties. Different types of electrical cables and wires used in electronics. Ohm's Law, Series & parallel resistance circuits, Concept of open and close circuit, Distribution of V & I in series parallel circuits, Kirchhoff's Laws and their applications.

Unit -5

Active and Passive Components: Resistors; types of resistors & specific use, color-coding, power rating. Inductance and Inductive reactance, Types of inductors, specifications, applications and energy storage concept, Self and Mutual induction. Capacitance and Capacitive reactance, Types of capacitors (including color coding), specifications, applications and energy storage concept, Significance of Series parallel connection of capacitors. Impedance of series parallel circuits. Semiconductor (P-type and N-type), Diode (PN Junction) & its V-I characteristics, Function of Zener diode, LED, Varactor diode, Photo Diode and Schottky Diode. Transistor and its types (N-P-N & P-N-P), IC & its classification, Making Monolithic IC & fabrication of components.

Unit -6

Analog Electronics: DC regulated power supply, Rectifiers, Bridge type Full wave rectifier, Filters and types of filter circuits, Voltage regulator using zener diode and IC (78××,79××,LM317)., Transistor as switch and amplifier, Working principle of JFET & MOSFET, Overview of Transformer (step up and step down), Opto-Electronics. Overview of Multimeter (Analog & Digital). Overview of OPAMP and its application. Different switches, their specification and usage.

Unit -7

Digital Electronics: Overview of Digital IC, Concept of CMOS, Familiarization of different types of Logic gates (Basic &Universal gates), Basics of combinational and sequential logic circuit, Memory devices (RAM, ROM, flash and Cache).

Unit -8

Soldering/ De-soldering, SMD and SMT

Soldering technique, Different types of soldering guns related to temperature, wattages and specific requirement. Types of tips. Solder materials and their grading. Use of flux and other materials. De-soldering technique. Soldering and De-soldering stations and their specifications. Introduction to SMD technology. Identification of 2, 3, 4, 8 terminal SMD components. Advantages of SMD components over conventional lead components. Soldering of SM assemblies - Reflow soldering. Introduction to Surface Mount Technology (SMT) & its advantages and Surface Mount components. Identification of Programmable Gate array (PGA) packages. Specification of various tracks, calculation of track width for different current ratings. Cold/ Continuity check of PCBs. Identification of lose / dry solders, broken tracks on printed wiring assemblies. Introduction to Pick place Machine, Reflow Oven, Preparing stencil & stencil printer for solder paste

application, Introduction to Static charge, Causes and prevention of static charge, Handling of static sensitive devices, various standards for ESD. Introduction to non-soldering interconnections. Basics of construction of Printed Circuit Boards (single, double, multilayer).

Learning Resources Recommended:

Sl.No.	Name of Author	Title of the Book
1	V.K. Mehta, Rohit Mehta	Principles of Electrical Engineering and Electronics
2	Robert L. Boylestad	Electronic Devices and Circuit Theory
3	Albert Malvino	Electronic Principles
4	Morris Mano	Digital Logic and Computer Design
5	Howard H. Manko	Soldering Handbook for Printed Circuits and Surface Mounting

PAPER-I (TRADE PRACTICAL)(FIRST YEAR)

Total Period: 85	End Exam: 50 Marks
Timing of End Exam:3 Hours	

LIST OF PRACTICALS:

1. Construct a test lamp and use it to check mains supply healthiness and verify earthing continuity.
2. Identify the all type of (analog/ Digital) meters by dial and scale marking/ symbols or uses.
3. Measure AC and DC voltages using multi meter and DSO.
4. Check the continuity of wires, meter probes, fuse and different types of active & passive electronic components by using multimeter.
5. Measure AC voltage by using NCV feature of DMM.
6. Measure the resistor value by colour code and verify the same by measuring with multimeter.
7. Test the different types of diode (Zener/ TVS diode (Transient Voltage Suppression), LED, Varactor, Photo Diode and Schottky) using multi meter and determine forward to reverse resistance ratio.
8. Identify different types of transistors based on their package type, pin configuration (B-E-C), function (switching vs power). Test a given transistor using ohm-meter.
9. Construct and test a full wave bridge rectifier circuit.
10. Construct and test a $\pm$12V fixed voltage regulator power supply using (78/79 series) IC.
11. Construct and test a 1.25V – 37V variable output regulated power supply using IC LM317T.
12. Verify the truth tables of all Logic Gate ICs by connecting switches and LEDs.
13. Use digital IC tester to test the various digital ICs (TTL and CMOS).
14. Practice soldering of different electronic components through PTH.
15. Practice soldering on IC bases and PCBs, Practice de-soldering using pump and wick or Join the broken PCB track and test.

16. Make the necessary settings on SMD soldering station and de-solder various ICs of different packages (at least four) using proper tools.
17. Identification of loose /dry solder, broken tracks on printed wired assemblies and Check for cold/ hot test of PCB/PCBA.
18. Identification of 2, 3, 4, 8 terminal SMD components and De-solder the SMD components from the given PCBA. Solder the SMD components again in the same PCB.
19. Make the necessary setting rework of defective surface mount component using desoldering/soldering method.
20. Check and repair Printed Circuit Boards single/double/multi layer and important tests for PCBs or Inspect soldered joints, detect the defects and test the PCB for rework.

CLASS XI - PAPER II (THEORY AND PRACTICAL)

Employability Skills:

Unit 1: Information and Communication Technology-I

Theory

- Introduction to ICT and Its Importance
- Basic Components of a Computer System
- Operating Systems and File Management
- Introduction to AI

Practical

- Identifying Hardware Components and Their Functions
- Creating, Saving, and Managing Files and Folders
- Typing Practice and Using Word Processing Software
- Using Internet for Browsing, Information Search and AI.

Unit 2: Green Skills & Sustainability-I

Theory

- Introduction to Green Skills and Their Importance
- Natural Resources and Their Conservation
- Sustainable Development and Its Principles
- Effects of Human Activities on the Environment

Practical

- Identifying Eco-friendly Practices at Home and School
- Creating Posters or Slogans on Environmental Awareness
- Planting Trees and Maintaining Green Corners
- Waste Segregation and Recycling Activities
- Group Discussion on Local Environmental Issues

Vocational Skills:

PAPER–II (TRADE THEORY-2)

Unit -3

Mobile Technology:

1. **Overview of Mobile Technologies**
    - History and evolution of mobile technology.
    - Types of mobile devices (smartphones, tablets, wearables, IoT devices).
    - Difference between smartphone and basic mobile phone.
    - Mobile operating systems (Symbian, iOS, Android,Windows).
2. **Mobile Ecosystem**
    - Components of the mobile ecosystem: Devices, operating systems, apps, networks.
    - Mobile device architecture (CPU, RAM, sensors, display, battery).

- Mobile application stores (Google Play, App Store, alternatives).

3. **Mobile Communication and Networking**
   - Mobile communication networks (2G, 3G, 4G, VoLTE, 5G, 5G NR). Overview of the key mobile telecommunication protocols used in various generations.
   - IR, Wi-Fi, Bluetooth, NFC, Zigbee, LoRaWAN and other wireless communication methods. GPS in mobile devices.
   - Cellular network principles: Frequency spectrum, bandwidth, latency, throughput.

Unit -4

Introduction to Smartphones

1. **Overview of Smartphones**
   - Evolution of smartphones.
   - Types of smartphones based on OS, design and form factor, target audience/market segment, connectivity and network support.
   - Key features of operating system (Android, iOS).
   - Key components of smartphones (CPU, GPU, RAM, Internal Storage, Display, Battery, Camera, Sensors, Wireless Connectivity) and their features.
2. **Smartphone Architecture & components**
   - Internal hardware and external components.
   - System-on-chip (SoC) architecture and mobile processors.
   - Operating system architecture and its interaction with hardware.
   - Overview of SIM & IMEI numbers, types of SIM cards.
   - Description of USB, concept of OTG, Ethernet port, Card reader, different types of network/ data cables, different connectors and sockets.

Unit-5

Mobile Security

1. **Introduction to Mobile Security**
   - Mobile security challenges and threats.
   - Mobile malware and security vulnerabilities.
2. **App Security Features**
   - Encryption (AES, RSA) and securing sensitive data.
   - Authentication mechanisms (biometrics, 2FA, PIN).
   - Protecting app data and preventing data leaks.
3. **Secure Mobile App Distribution**
   - Publishing apps on app stores (Google Play, Apple App Store).
   - App signing and certificates.
   - App store security guidelines and best practices.

Unit -6

Mobile App Networking and APIs

- HTTP, RESTful APIs, and Web Services.
- JSON and XML for data exchange.
- Handling network errors.
- Integrating third-party services (Google Maps, social media APIs, payment gateways).
- Authentication and authorization (OAuth, JWT).

- Working with Firebase and cloud-based services.

Unit-7
Future Trends in Mobile Technology

- Artificial Intelligence and Machine Learning in mobile apps.
- Augmented Reality (AR) and Virtual Reality (VR) in mobile.
- Mobile apps for IoT devices.
- Smart homes and connected devices.
- Caching strategies for mobile apps.

Learning Resources Recommended:

Sl.No.	Name of Author	Title of the Book
1	Asoke K Talukder, Hasan Ahmed, Roopa R Yavagal	Mobile Computing: Technology, Applications, and Service Creation
2	Elizabeth Woyke	The Smartphone: Anatomy of an Industry
3	Himanshu Dwivedi, Chris Clark, David Thiel	Mobile Application Security
4	Martin Ford	Architects of Intelligence: The Truth About AI from the People Building It

PAPER-II (TRADE PRACTICAL)(FIRST YEAR)

Total Period: 85	End Exam: 50 Marks
Timing of End Exam:3 Hours	

LIST OF PRACTICALS:

1. Disassemble and assemble different parts of mobile phones.
2. Identify and practice troubleshooting of network connection issues.
3. Practice lock/ unlock of SIM and check mobile IMEI number.
4. Demonstrate working process of USB and Ethernet port.
5. Identify the different functional areas/ blocks of motherboard of basic multimedia handset.
6. Identify problems and replace display and keypad of basic mobile handset.
7. Demonstrate downloading procedure, registration procedure via banking, sharing internet via hotspot, file sharing procedure of Bluetooth, data cable, OTG, card reader, etc.
8. Perform assembling and disassembling of Smartphone using different tools.
9. Disassemble mobile phone and place the motherboard on a PCB holder.
10. Check PCB tracks using multimeter and find the fault/ missing tracks that need jumper.
11. Practice setting different parameters for proper use of various machine viz., blower, DC power supply, charging booster machine etc.
12. Demonstrate SMD rework station for QFN (Quad flat no lead) package IC installing. De-solder and remove the QFN IC from the PCB and clean the solder from the bottom of the IC.
13. Identify damages from ingress of water and practice to resolve.
14. Analyze the hanging issues and practice to resolve it.

15. Perform process of locking and unlocking system.
16. Use of different flashing box and flashing tools for flashing software.
17. Apply procedure of flash android specific software for working phone with Odin.
18. Apply procedure of flash android specific software for dead phone with UFI.
19. Apply procedure of flash Android phone with MTK, SPD, Qualcomm etc. Flash tool.
20. Create & restore backup data/dump from mobile phone to a computer.

CLASS XII – PAPER I (FULL MARKS: 100)

	Units	No. of Theory classes (In Hours)	No. of Practical Classes (In Hours)	Max Marks
Part A	**Employability Skills**			
Unit 1	Communication Skills–II	04	05	10
Unit 2	Self-management Skills–II	03	05	
Unit 3	Entrepreneurial Skills–II	03	05	
	Total (A)	**10**	**15**	**10**
Part B	**Vocational Skills**			
Unit 4	Smartphone Hardware	20	85	40
Unit 5	Smartphone Hardware Repair	7		
Unit 6	Smartphone Diagnostics and Tools	8		
Unit 7	Smartphone Upgradation	5		
Unit 8	Smartphone Common Troubleshooting	10		
	Total (B)	**50**	**85**	**40**
Part C	**Practical Work**			
	Practical Examination			20
	Written Test			10
	Viva Voce			10
	Practical Record			10
	Total (C)			**50**
	Grand Total (A+B+C)	**60**	**100**	**100**

CLASS XII – PAPER II (FULL MARKS: 100)

	Units	No. of Theory classes (In Hours)	No. of Practical Classes (In Hours)	Max Marks
Part A	**Employability Skills**			
Unit 1	Information and Communication Technology Skills–II	05	10	10
Unit 2	Green Skills and Sustainability–II	05	05	
	Total (A)	**10**	**15**	**10**
Part B	**Vocational Skills**			
Unit 3	Introduction to Mobile Application Testing	10	85	
Unit 4	Mobile App Testing Tools	12		
Unit 5	Mobile App Functional Testing	15		
Unit 6	Mobile App Performance and Load Testing	10		
Unit 7	Mobile App Automation Testing	8		40
	Theory (B)	**50**	**85**	**40**
Part C	**Practical Work**			
	Practical Examination			20
	Written Test			10
	Viva Voce			10
	Practical Record			10
	Total (C)			**50**
	Grand Total (A+B+C)	**60**	**100**	**100**

CLASS XII - PAPER I (THEORY AND PRACTICAL)

Employability Skills:

Unit 1: Communication Skills-II

Theory

- Formal and Informal Communication
- Written Communication: Email and Letter Writing
- Presentation Skills and Public Speaking
- Communication in the Workplace

Practical

- Writing Formal Emails and Letters
- Preparing and Delivering a Short Presentation
- Conducting and Participating in Interviews
- Mock Meetings and Report Writing
- Debates and Panel Discussions

Unit 2: Self Management Skills-II

Theory

- Developing Self-motivation and Initiative
- Goal Setting and Decision Making
- Adaptability and Resilience
- Conflict Resolution and Problem Solving

Practical

- Setting SMART Goals and Action Plans
- Role Plays on Decision Making and Problem Solving
- Activities on Handling Change and Adversity
- Group Tasks for Conflict Resolution
- Self-motivation Exercises and Daily Affirmations

Unit 3: Entrepreneurial Skills-II

Theory

- Business Planning and Resource Mobilization
- Marketing and Customer Relationship Management
- Financial Literacy and Budgeting for a Small Business
- Legal and Ethical Aspects of Business

Practical

- Drafting a Detailed Business Plan
- Creating Marketing Materials (Flyers/Posters)
- Simulated Budgeting and Expense Tracking
- Business Role Play: Selling a Product or Service
- Case Study Analysis of Successful Entrepreneurs

Vocational Skills
PAPER–I (TRADE THEORY-I)

Unit -1: Smartphone Hardware

- Overview and working process of Mainboard, display, camera.
- Understanding the role of sensors (accelerometer, gyroscope, proximity sensor, hall sensor, UV sensor, IRIS, Fingerprint sensor, magnetometer, ambient light sensor, GPS, barometer etc.).
- Concept of different types of IC used in Smartphone, their identification and functions.
- Overview and working process of speaker, mic, vibrator, earphone connector, charging port, charging connector, data cable connector.
- Battery system & different type of Cells/ Batteries used.
- Display system: LCD, OLED, OCA, Touch screen.
- Different types of antenna used in handsets.
- Concept of multimedia.
- Circuit Diagram and block diagram of basic multimedia handset.
- PCB and concept of its connections.
- Concept and working of heat-sink .
- Different SD cards and their features.

Unit -2: Smartphone Hardware Repair

1. **Disassembly and Assembly**
   - Standard safety precautions while repairing handsets.
   - How to safely disassemble and reassemble smartphones.
   - Handling delicate components and ensuring safe reassembly.
2. **Smartphone Troubleshooting and Repair**
   - Testing of various parts and components used in smart phone.
   - Diagnosing hardware issues (display problems, hanging of phone, dead handset).
   - Software and hardware interactions: when software fixes aren't enough.
   - Causes and solution to Flashing Map Problem.

Unit – 3: Smartphone Diagnostics and Tools

- Using diagnostic tools (multimeter, DSO, thermal cameras, and testing equipment).
- Built-in diagnostics tools, Third-Party Diagnostic Apps,
- Tools and kits for smartphone repair (screen replacement kits, heat guns, etc.).
- Description of Jumpering techniques and solutions.
- Concept of Ultrasonic cleaning in smartphone.
- Use of internet for trouble shooting faults.

Unit -4: Smartphone Upgradation

- Study of Phone Upgradation.
- Introduction to Tablet type Computer. Functional block diagram of Tablet.

- Study of various radiation Levels of Smartphone.
- Steps to update the software of popular mobiles, create a backup of data to a computer or cloud and restore setting.
- Wi-Fi protection.

Unit -5: Smartphone Common Troubleshooting

- Datasheet reading techniques.
- Borneo schematic and hardware solution.
- Possible causes and solutions to:
  1. Smartphone Won't Turn On.
  2. Phone Is Frozen/ Unresponsive.
  3. Phone Battery Drains Quickly.
  4. Phone Not Connecting to Wifi.
  5. Apps Not Opening or Crashing.
  6. Phone Not Charging.
  7. Screen Is Too Dark or Not Responding to Touch.
  8. No Sound or Distorted Sound.
  9. Phone Overheating.
  10. Apps Missing or Disappearing.
  11. Camera not working.
  12. Sound or speaker problem.
  13. Slow performance.
  14. Fingerprint scanner not working.

Learning Resources Recommended:

Sl.No	Name of Author	Title of the Book
1	Er. Devendra Kumar	Advance Mobile Repairing Course Book (Android & iPhone Smartphone Repairing)
2	Chukky Oparandu	Mobile Phones and Tablets Repairs: A Complete Guide for Beginners and Professionals
3	S.K. Gupta	Smart Phone Android Hardware Solution
4	Paolo Dabove	Smartphones: Recent Innovations and Applications

PAPER- I (TRADE PRACTICAL)(SECOND YEAR)

Total Period: 85	End Exam: 50 Marks
Timing of End Exam:3 Hours	

LIST OF PRACTICALS:

1. Demonstrate Storage testing, compatibility testing and application response testing.
2. Perform memory leakage testing, interrupt testing, usability testing, Installation testing, certification testing, location testing, upgrading existing software, load testing, uninstallation testing, backup & restore testing, power consumption testing.

3. Types of Battery: Voltage Test, Charging Test, Load Test, Battery Tester and Replace battery of faulty Smartphone.
4. Testing the Display (LCD/OLED): Visual Inspection, Touch Functionality, Display Brightness, Test with an External Display.
5. Testing the Camera: Image Capture Test, Focus Test, Flash Test, Camera App Behavior and Replace camera of faulty Smartphone.
6. Testing the Speaker and Microphone: Speaker Test, Microphone Test, Loudspeaker Volume Test, Headphone Jack Test and Replace speaker & microphone of faulty Smartphone.
7. Testing the Charging Port and Battery Charging Circuit: Visual Inspection, Voltage Test, Charging Behavior, Test with Another Cable/Charger.
8. Testing the Power Button and Fingerprint Sensor: Power Button Test, Fingerprint Sensor Test and and Replace finger print sensor of faulty Smartphone.
9. Testing Wi-Fi, Bluetooth, and Cellular Connectivity: Wi-Fi Test, Bluetooth Test, Cellular Test, Signal Strength.
10. Testing Sensors (Accelerometer, Gyroscope, Proximity, Ambient Light Sensor, Hall sensor, UV sensor, Magnetometer (Compass) etc.) and Replace different sensors of faulty Smartphone.
11. Testing the SIM Card and SD Card Slots: SIM Card Slot Test, SD Card Slot Test.
12. Testing the Vibration Motor: Vibration Test and Replace vibrator of faulty Smartphone.
13. Perform replacement of components viz. touch sensor, earphone connector, charging connector, data cable connector etc.
14. Demonstrate SMD rework station for BGA IC Reballing and Installing. De-solder and remove the BGA IC from the PCB and clean the solder from the bottom of the IC.

CLASS XII - PAPER II (THEORY AND PRACTICAL)

Employability Skills:

Unit 1: Information and Communication Technology Skills-II

Theory

- Introduction to Spreadsheet and Presentation Tools
- Basics of Cyber Safety and Security
- ICT in Daily Life and Workplace
- Emerging Trends in ICT

Practical

- Creating and Formatting Spreadsheets
- Designing a Simple Presentation
- Practicing Safe Browsing and Understanding Online Threats
- Using ICT Tools for Education and Communication
- Participating in an Online Quiz or Form Submission

Unit 2: Green Skills and Sustainability-II

Theory

- Green Economy and Green Jobs
- Role of Individuals in Environmental Protection
- Renewable and Non-renewable Energy Sources
- Government Policies and Initiatives on Sustainability

Practical

- Survey on Environmental Practices in the Community
- Preparing a Report on Green Businesses
- Organizing a Cleanliness or Awareness Drive
- DIY Projects Using Recycled Materials
- Preparing a Presentation on a Green Topic

Vocational Skills

PAPER–II (TRADE THEORY-II)

Unit -1: Introduction to Mobile Application Testing

1. **Overview of Mobile Application Testing**
    - Importance of mobile app testing.
    - Different types of mobile applications (native, hybrid, web).
    - Mobile application testing phases (functional testing, performance testing, security testing).
2. **Testing Methodologies and Approaches**
    - Manual vs. automated testing.
    - Testing on Android and iOS platforms.
    - Key differences between Android and iOS app testing.

Unit -2: Mobile App Testing Tools

1. **Testing Tools for Android**
    - ADB (Android Debug Bridge) / USB Driver.
    - Appium, Espresso, and UIAutomator for automated testing.
    - Firebase Test Lab and Google Play Console for app distribution and testing.
2. **Testing Tools for iOS**
    - Xcode, XCTest, and Instruments for iOS testing.
    - Appium, Calabash for cross-platform testing.
3. **Cross-Platform Mobile Testing Tools**
    - Introduction to tools like Selenium, Appium, and Detox.
    - Setting up and running tests across multiple platforms (Android and iOS).

Unit -3: Mobile App Functional Testing

1. **Functional Testing Techniques**
    - Testing mobile app features (login, registration, data syncing).
    - Usability and UI testing.
    - Testing app functionality with multiple input types (touch gestures, Voce commands).
    - Ensuring the app works across different devices, OS versions, and screen sizes.
2. **User Interface (UI) Testing**
    - Identifying UI/UX issues in mobile apps.
    - Testing app responsiveness (different screen sizes, orientations).
3. **Security Testing for Mobile Apps**
    - Common mobile app security vulnerabilities (SQL injection, data leakage).
    - Using penetration testing tools (Burp Suite, OWASP ZAP).
    - Securing app data (encryption, authentication methods).

Unit -4: Mobile App Performance and Load Testing

1. **Performance Testing**
    - Measuring app load time, startup time, and resource consumption.
    - Techniques for reducing app lag, improving load time.
    - Tools for load testing and profiling mobile apps.
2. **Battery and Memory Management Testing**
    - Testing apps for battery consumption and optimizing power usage.
    - Memory leak detection and resolution.
    - Tools for analyzing CPU efficiency and memory usage (Android Profiler, Instruments).
    - Backup & restore testing

Unit -5: Mobile App Automation Testing

- Benefits of automating mobile application tests.
- Overview of test automation frameworks (Appium, Selenium).
- Setting up a test automation environment.

- Handling app releases, updates and bug fixes.
- Handling gestures, animations, and different screen sizes in automated tests.

Learning Resources Recommended:

Sl.No.	Name of Author	Title of the Book
1	Daniel Knott	Hands-On Mobile App Testing
2	CemKaner, James Bach, Bret Pettichord	Lessons Learned in Software Testing: A Context-Driven Approach
3	Ron Patton	Software Testing (2nd Edition)

PAPER-II (TRADE PRACTICAL)(SECOND YEAR)

Total Period: 85	End Exam: 50 Marks
Timing of End Exam:3 Hours	

LIST OF PRACTICALS:

1. Perform functional test to check if the App meets its purpose.
2. Apply Best Practices in Mobile app & setting testing.
3. Removal of virus using apps.
4. Break password using apps. Demonstrate process of password cracking.
5. Install various application and system softwares including Operating System in mobile phones.
6. Software and System Testing: Boot Test, App Functionality, System Reset Test.
7. Perform encryption and decryption of password in mobile phone.
8. Perform web security testing.
9. Test download, Installation, Execution, Integration, Auto Updates, Cross OS, cross Device, cross versions.
10. Basic process of disassembly and assembly using appropriate tools and disassemble & assemble a Flagship Phone (Note Series).
11. Basic process of disassembly and assembly using appropriate tools and disassemble & assemble a Foldable Smartphone.
12. Basic process of disassembly and assembly using appropriate tools and disassemble & assemble a Wearable.
13. How to Perform Water resistance test.
14. Perform an OCA on a smartphone.