SUBJECT: MOBILE/SMART PHONE REPAIR (MOSP)

CLASS XII
SEMESTER III

THEORY

FULLMARKS–20

(MCQTypeQuestion)

UNIT	Topic	No. of periods assigned	Marks
Unit1	**Occupational safety**	**8**	**7**
Unit2	**HistoryofMobile phone**	**9**	**7**
Unit3	**Introductionto different types of mobile cellphones**	**8**	**3**
Unit 4	**Familiarization and working principle of different parts of a mobile cell phone**	**20**	**3**

DETAILSYLLABUS

UNIT	Topic/SubTopic	No.ofperiods assigned
Unit1	1.1 Basic safety introduction & Personal protection like use of well insulated tools, use of gloves, keeping the soldering iron in the right place unplugging equipment when not in use 1.2 Basic injury prevention & elementary first aid 1.3 Safety sign for Danger, Warning, caution and personal safety message 1.4 Use of C type Fire extinguishers 1.5 Concept of Standard safety precautions 1.6 Proper disposal of electronic wastes	**8**
Unit2	2.1 History of Mobile Phone and common features of mobile phone (DCT 3, 4, BB 5 etc.). Basics of Mobile Communication Familiarization with generation of mobiles viz., GSM/CDMA/ WCDMA etc. Mobile phone structure, Frequency, Channels, GPS, EDGE, HSPA. Overview of SIM & IMEI numbers. Introduction of GPRS, Bluetooth & Infrared technology and working principle. Circuit Tracing of Different Section of Mobile Phone. Description of USB, Ethernet port and different types of network/ data cables. Concept of mobile Network, LAN, MAN, WAN. 2G/3G/4G /5G network protocols.	**9**

Unit3	3.1 Basic Principles of Mobile Phones 3.2 Study of different types of Mobile phones like • Bar Phone • Flip Phone • Slider Phone • Touch screen Phone	**8**
Unit 4	4.1 To Study about different parts of mobile phones like • Keypad • Ear piece • Mouth piece • Battery • Power switch • Power switch • Oscillator • Screen or display • Flash IC • Charging IC • CPU • Antenna etc.	**20**

MOBILE/SMART PHONE REPAIR

SEMESTER IV

THEORY

FULLMARKS–30

(SAQANDLAQTypeQuestion)

UNIT	Topic	No.ofperiodsassigned	Marks
Unit5	**Differencebetween smartPhoneand Basic Mobile Phone**	**10**	**7**
Unit6	**Knowledge of using hardware and software tools to repair mobile cell phones**	**15**	**9**
Unit7	**Introduction and working principle of different sections of Mobile phones for assembling and disassembling purpose**	**13**	**7**
Unit 8	**Different types of mobile cell phone faults and to rectify them.**	**25**	**7**

DETAILSYLLABUS

UNIT	Topic/SubTopic	No.ofperiods assigned
Unit5	5.1 Difference between Smart Phone and basic mobile phone. Study various part of Smartphone architecture. Overview of mobile operating system and types of OS. Concept of Android and windows technology in mobile system. Basic features of Android & windows and its applications. Functions of Smartphone components. Concept of Wi-Fi. Downloading through internet, share with Bluetooth, share internet via hotspot, Data cable & Card reader, concept of OTG, NFC.	**10**
Unit6	• To study different types of Hardware tools like • Soldering Iron • PCB Holder / PCB Stand • different Cutters • Precision Screwdriver • Tweezers • Brush • Multimeter • Hot Air Blower • Battery Booster • Screwdriver Kit • Microscope • Test JIG Box • Battery Tester • LCD Tester etc.	**15**

	To study different types of Software tools like • Tenorshare ReiBoot • Phone Doctor plus • All-in-one Toolbox etc.	
Unit7	To study about the assembling and disassembling of different internal sections of a Mobile Phone like • SIM card section • Memory card section • Ear Speaker Section • Speaker/Ringer Section • Key Backlight Section • LCD Backlight Section • Vibrator Motor Section • Network Section • Battery Charging Section • FM Radio Section • Bluetooth Section • Hands free (Earphone) Section	**13**
Unit 8	Study to identify and to rectify Hardware faults like • Battery charging faults/problems due to false charging, not charging etc. • Mobile phone battery problem (faults) • Network not working problem • Overheating problem • Sound faults • Ear piece, ringer and microphone problem Lighting or LED problems • Keypad problems • SIM faults • Wi-Fi problem • internet connectivity problems • Display problems • Touch screen problems Study to identify and to rectify Software faults like Display problems • No signal message • Dead phone set • Phone on test mode Phone not charging • Phone has message to contact service provider • Phone hangs, goes off, freezes or has slow processing Study to identify and to rectify Software faults like Display problems, no signal message, dead phone set and phone on test mode, phone hangs etc. Reload the correct software and test for its serviceability.	**25**

	• Concept of third party software. Procedure of removing virus from infected codes. Knowledge about locking system (lock & unlock). Role of firmware in a mobile handset. Steps to install a new firmware. Overview of encryption and decryption of password in mobile phone	

PRACTICAL

CLASS XII

FULLMARKS–40

NOOFPERIODSASSIGNED–84

DETAILSYLLABUS

Sl.No.	Practical	Classes
1	**Use of different types of tools required for repairing of mobile phones**	**21**
	1.1. Soldering technique with hot air gun. 1.2. Desoldering technique for the removal of components from a PCB. 1.3. Procedure to measure resistance, voltage and current by using a multimeter for the PCB component of a mobile phone 1.4. Procedure to use jumper to bypass faulty components.	
2	**Fault diagnosis skill of mobile phones**	**21**
	2.1 Identify the faulty components by cold testing method i.e to use a multimeter to check the value of resistance during powered off condition 2.2 Identify the faulty components by hot testing method i.e to use a multimeter to check the value of voltage during powered on condition	
3	**Repairing of common Mobile phone faults**	**42**
	3.1 To rectify the intermittent faults like • excess temperature • excess current or voltage • ionizing radiation • mechanical shock • stress or impact • contamination • mechanical stress • short circuits • imperfect connections 3.2 To rectify the battery charging faults by • Cleaning, re soldering or changing the charger Connector • Changing the battery and check again • Check the voltage of the battery connector using a Multimeter. The voltage should be between 1.5 and 3.7 Volts. • Checking the fuse, coil and regulator one by one and change the faulty part. • Changing the charging IC. • Changing the Power IC	

	3.3 To rectify Mobile phone battery problem (faults) by • Checking the battery connector and charging plug • Upgrading the software to latest version • Checking the Mobile phone PBA current consumption or any short circuit 3.4 To rectify the network problem by • Cleaning the antenna tips and points • Repairing or replacing the antenna switch • Repairing or replacing the PFO • Repairing or replacing Network IC • Replacing the power IC or CPU 3.5 To rectify the sound problems by checking • the speaker and microphone • Earpiece • Audio and power IC • CPU 3.6 To rectify the display problems by • Cleaning the display tip and display connector • De soldering the display connector • Checking the display track • Changing the display • Changing the display IC and /or CPU 3.7 To rectify the LED problems by • Checking the light setting and re soldering all the LEDs • Checking all the LEDs with the multimeter Changing the light IC, power IC and display 3.8 To rectify phone touch screen faults by • Cleaning , resoldering and/or changing the PDA tips and connectors • Checking the track of PDA section and/or changing the PDA IC, CPU 3.9 To rectify keypad problems by • Cleaning the keypad and keypad points • Using the multimeter to check the row and column of keypad • Changing keypad IC/ and or CPU 3.10 To rectify SIM problems by • Cleaning the SIM card tips and SIM connectors • By changing the SIM card, SIM IC and power IC 3.11 To rectify software problems by • Removing the application software that causes problems • Reset the factory setting of mobile phones and update the software	

PROJECT

CLASSXII

FULLMARKS–10

NO OF PERIODS ASSIGNED–60

DETAILSYLLABUS

Name of the Project: Assembling and dis-assembling of different sections of a typical mobile phone system.		
Objective – • To learn the step-by-step process of disassembling and reassembling a mobile phone safely. • To identify and understand the function of key mobile phone components. • To analyze the interconnections and working principles of different sections. • To practice troubleshooting techniques for common hardware faults.		
Sl.No.	**Tasks**	**Classes**
1	**Preparation**	**12**
	- Ensure all necessary tools and safety equipment are available. - Power off the mobile phone and remove the SIM card and memory card. - Document the initial condition of the phone by taking pictures.	
2	**Disassembly Process**	**24**
	- Back Cover Removal - If it has a removable battery, open the back cover using a plastic pry tool. - If it's a unibody design, use a suction cup and heat gun to loosen the adhesive. - Battery Removal - If the battery is removable, lift it out carefully. - If it's non-removable, use a plastic spudger to detach it after disconnecting the battery connector. - Removing Screws & Mid-Frame - Unscrew all visible screws using a screwdriver (Torx/Phillips). - Use a plastic tool to gently pry open the mid-frame or back casing. - Disconnecting Internal Components - Carefully detach flex cables, connectors, and ribbon cables using tweezers. - Identify and remove the following major components: - Motherboard (PCB) - Display assembly (LCD & digitizer) - Charging port - Speaker & microphone - Camera modules - Buttons & vibration motor - Antenna & other connectivity modules	

	- Screen Removal (If Necessary) - If analyzing the display, remove the screen using a heat gun to soften the adhesive.	
3	**Identification & Analysis**	**12**
	- Examine each component and understand its function in the system. - Document connections and placement for reassembly.	
4	**Reassembly Process**	**12**
	- Reconnect all components carefully in reverse order. - Reinstall the battery and mid-frame. - Secure all screws and reattach the back cover. - Power on the device and test if it functions correctly. -	