National Occupational Skill Standard (NOSS)

Occupational Title : **Cell/Mobile Phone Repair Technician**

Level : **2**

Sector : **Electronics**

Sub - Sector : **Telecommunication**

NOSS ID/NSCO ID :

ISCO NO :

Council for Technical Education and Vocational Training

NATIONAL SKILL TESTING BOARD

Madhyapur Thimi-2, Sanothimi, Bhaktapur, Nepal

Developed: 09-04-2021 (27-12-2077)

2045

DACUM Panel

No	Name	Designation	Organization
1.	Mr. Ram Babu Bhatta	Mobile Repair Technician	TRL Electronic Shop Sorakhutte, Kathmandu
2.	Ms. Tara Bhatta	Mobile Repair Technician	TRL Electronic Shop Sorakhutte, Kathmandu
3.	Mr. Krishna Prasad Gotame	Mobile Repair Technician	KLG Mobile Repairing Center Shwoyambhu, Kathmandu
4.	Mr. Bikesh Chansi	Mobile Repair Technician	Micro Electronic Center Pepsikola, Kathmandu
5.	Mr. Ashok Kumar Sunchuri	Mobile Repair Technician	Micro link Kathmandu
6.	Mr. Yogendra Shahi	Mobile Repair Technician	Prakriti Electronic and mobile Patan, Sundhara
7.	Mr. Ram Kumar Shrestha	Mobile Repair Technician	BKS Mobile Patan, Sundhara
8.	Mr. Santosh Phunyal	Mobile Repair Technician	Gita Trade Store Kathandu
9.	Mr. Rohit Mangrati	Mobile Repair Technician	UCEP Nepal Sanothimi, Bhaktapur
10.	Mr. Mohan Khatri	Mobile Repair Technician	Photo fashion Mobile Shop Shwoyambhu, Kathmandu

DACUM Coordinator

Mr. L.B. Sunchuri, Principal, Mordern Electronic, Maitighar, Kathmandu

DACUM Facilitator/Recorder

Mr. Jeeban Chandra Dahal, CTEVT
Mr. Mister Kanti Mainali, CTEVT

DACUM Workshop on 18 & 19 February 2012

DACUM Verification Panel

No	Name	Designation	Organization
1.	Mr. Kamal Koirala	Member	Mobile Repair Center Bir Hospital, Ratnapark
2.	Mr. Ashok Kumar Sunchuri	Member	Micro Electronic Center Pepsikola, Kathmandu
3.	Mr. Ram Kumar Sunar	Member	Lumbini Computer & Mobile Repairing Center Nawalparasi
4.	Mr. Raju Kumar Sah	Member	Modern Electronics Janakpur
5.	Mr. Bikesh Chansi	Member	Bishal Mobile Koteshwor, Kathmandu
6.	Mr. Jaya Ram Ghimire	Member	J.R.G. Mobile Solution P. Ltd. Mahaboudha, Kathmandu
7.	Mr. Sudarshan Poudyal	Member	Samriddhi Trade Linek Newroad, Kathmandu
8.	Mr. Bishow Raj Napit	Member	Nokia G2 Tamrakar Complex, New Road, Kathmandu
9.	Ms. Nani Maya Sunchuri	Member	J.R.G. Mobile Solution P. Ltd. Mahaboudha, Kathmandu
10.	Mr. Ram Babu Bhatta	Member	TRL Electronic Shop Sorakhutte, Kathmandu
11.	Ms. Tara Bhatta	Member	TRL Electronic Shop Sorakhutte, Kathmandu
12.	Mr. Krishna Prasad Gotame	Member	KLG Mobile Repairing Center Shoyambh, Kathmandu

DACUM Facilitator/Recorder

Mr. Tulsi K.C., Sr. Skill Testing Officer, NSTB, Sanothimi

Mr. Ishwar Chandra Ghimire, Skill Testing Officer, NSTB, Sanothimi

Mr. Santosh Kumar Mahaseth, Skill Testing Assistant, NSTB, Sanothimi

The Occupational Profile (OP) Developed by:

No	Name	Designation	Organization
1.	Prof. Dr. Jagan Nath Shrestha	Coordinator	Electronic Technical Sub Committee National Skill Testing Board, Sanothimi, Bhaktapur
2.	Mr. Chandra Bhakta Nakarmi	Director	National Skill Testing Board, Sanothimi, Bhaktapur
3.	Mr. Deepak Lal Shrestha	Member	Institute of Engineering, Pulchowk Campus Pulchowk, Lalitpur
4.	Mr. Ashok Kumar Sunchuri	Member	Modern Electronics Institute Maitighar, Kathmandu
5.	Mr. Jaya Ram Ghimire	Member	J.R.G. Mobile Solution P. Ltd. Mahaboudha, Kathmandu
6.	Mr. Babuji Pandit	Member	Nepal Telecom, Telecom Training Center, Babarmahal, Kathmandu
7.	Mr. Santosh Kumar Mahaseth	Member	Skill Testing Assistant NSTB, Sanothimi, Bhaktapur
8.	Mr. Deepak Prasad Poudel	Member	Sr. Skill Testing Officer NSTB, Sanothimi, Bhaktapur
9.	Mr. Govinda Poudel	Member-Secretary	Skill Testing Officer NSTB, Sanothimi, Bhaktapur
10.	Mr. Tulsi K.C.	Member	Sr. Skill Testing Officer NSTB, Sanothimi, Bhaktapur
11.	Mr. Ishwar Chandra Ghimire	Member	Skill Testing Officer, NSTB, Sanothimi, Bhaktapur

Recommended by Electronics Technical Sub Committee: 23 March 2012

The Occupational Profile (OP) Revised by:

No	Name	Designation	Organization
1	Prof. Dr. Jagan Nath Shrestha	Coordinator	Electronic Technical Sub Committee NSTB, Sanothimi, Bhaktapur
2	Mr. Yam Bhandari	Director	National Skill Testing Board Sanothimi, Bhaktapur
3	Er. Ram Chandra Lamsal	Member	Nepal Telecom Jawalakhel, Lalitpur
4	Mr. Jaya Ram Ghimire	Member	Tripple (D) Technology Pvt. Ltd. Dillibazar, Kathmandu
5	Mr. Ashok Kumar Sunchuri	Member	HIM, Electronics Pvt. Ltd. Sundhara, Kathmandu
6	Er. Madan Suwal	Member	Nepal Telecom Sundhara, Kathmandu
7	Mr. Brijesh Shrestha	Member	Mantra The Mobile Care Saugal, Lalitpur
8	Mr. Puspa Pyakurel	Member Secretary	Skill Testing Officer NSTB, Sanothimi, Bhaktapur
9	Mr. Tulsi KC	Member	Sr. Skill Testing Officer NSTB, Sanothimi, Bhaktapur
10	Mr. Suresh Maharjan	Member	Skill Testing Officer NSTB, Sanothimi, Bhaktapur

Recommended by Electronics Technical Sub Committee: 3rd July 2016 (2073.03.19)

The National Occupational Skill Standard Developed by:

No	Name	Designation	Organization
1	Prof. Dr. Jagan Nath Shrestha	Coordinator	Electronic Technical Sub Committee NSTB, Sanothimi, Bhaktapur
2	Mr. Tek Bahadur Malla	Director	National Skill Testing Board Sanothimi, Bhaktapur
3	Mr. Salik Ram Acharya	Member	E Parcel Pvt. Ltd. Newroad, Kathmandu
4	Mr. Santosh Niroula	Member	Smart phone gallery Pvt. Ltd. Newroad, Kathmandu
5	Mr. Raju Adhikari	Member	Kathmandu Multi Traders Pvt. Ltd. Baneshwor, Kathmandu
6	Er. Santosh Kumar Mahaseth	Member	Office of Controller of Examinations (CTEVT) Sanothimi, Bhaktapur
7	Mr. Purna Bahadur Tamang	Member Secretary	Skill Testing Officer NSTB, Sanothimi, Bhaktapur
8	Mr. Tulsi K.C.	Member	Sr. Skill Testing Officer NSTB, Sanothimi, Bhaktapur
9	Mr. Suresh Maharjan	Member	Skill Testing Officer NSTB, Sanothimi, Bhaktapur
10	Mr. Kishor Chandra Sharma	Member	Skill Testing Assistant NSTB, Sanothimi, Bhaktapur

Recommended by Electronics Technical Sub Committee: 9 April 2021 (27 Chaitra 2077)

1	**Occupational Title: Cell/Mobile Phone Repair Technician** **Level: 2**
2	**Job Description:** Cell/Mobile Phone Repair Technician, L-2 repairs hardware faults and troubleshoots software problems.
3	**UNITS OF COMPETENCY:** 1. Repair hardware faults. 2. Troubleshoot software problems. 3. Perform communications 4. Develop professionalism ***Note: Unit 3 and 4 are not for testing purpose.***
	Qualifying Notes/Prerequisites: • Physical Requirements: Sound health • Entry Requirements: As per NSTB rules. **Additional Information:** • Assessment Types: Performance and written test. • Assessment Duration: 4 to 6 Hours (Single Competency) 8 to 10 hours (All Competency) • Recommended Group Size: 5 to 7 candidates

5	**Unit No: 1** **Unit Title: Repair hardware faults**	**Unit code:**

Elements of competency	Performance standards
1.1 Take mobile history	1.1.1 Customer greeted and welcomed in accordance with organization practice. 1.1.2 ***Information*** collected related to faulty mobile phone. 1.1.3 ***Personal*** and ***mobile details*** clearly mentioned in job sheet. 1.1.4 Fault/problem clearly mentioned in job sheet.
1.2 Diagnose mobile faults	1.2.1 ***Engineering mode codes*** used to identify hardware fault. 1.2.2 ***Personal protective equipment (PPE)*** used in accordance with task requirements. 1.2.3 Mobile phone set dismantled without damaging circuit/components. 1.2.4 Mobile phone visually inspected for ***physical damage***. 1.2.5 Cold and hot testing performed on printed circuit board (PCB). 1.2.6 ***Electronic components*** checked and verified with service manual/schematic diagram. 1.2.7 ***Electrical parameters*** tested and verified with service manual/schematic diagram. 1.2.8 Faulty ***components or sections/modules*** identified interpreting the test results.
1.3 Estimate cost	1.3.1 Mobile faults listed with spare parts required for repair. 1.3.2 Cost of repair calculated including material cost and service charge. 1.3.3 Customer informed about estimated cost for repair and risk factor. 1.3.4 Customer approval obtained prior to repair work.
1.4 Repair faulty components and sections/modules	1.4.1 Moisture, dust, rust/corrosion removed from mobile housing and PCB. 1.4.2 PCB checked for physical damage. 1.4.3 PCB traced as per schematic/circuit diagram. 1.4.4 Open/short circuit repaired through soldering, de-soldering and jumpering. 1.4.5 Solder joints melted without damaging circuit/components. 1.4.6 Components removed and new components placed and fixed at specified location as per the specification.

	1.5 Replace faulty components	1.5.1 Spare components/module collected as per technical/model specification of faulty components/module. 1.5.2 Faulty components/module removed without damaging circuit/components. 1.5.3 New components placed and fixed at specified location as per the specification.
	1.6 Perform testing	1.6.1 Repaired components checked for working condition. 1.6.2 Mobile set re-assembled without damaging circuit/components. 1.6.3 Mobile set checked for functioning. 1.6.4 Mobile fault documented as per organization process. 1.6.5 Customer informed on handling of mobile safely.
	1.7 Clean work area	1.7.1 Tools and equipment cleaned, maintained, stored and record updated. 1.7.2 Work area cleaned and waste disposed in accordance with ***3R's principle***.
6	**Task Performance Requirements (Tools, Equipment and Materials):** • Multimeter, screw driver set, soldering iron, soldering wire, soldering paste, SMD re-work station, tweezers set, cleaning brush, PCB bracket/holder, ultrasonic machine (micro vibrator), magnifying glass with lamp, pin holder, booster machine (desktop charger), BGA kit set, wire cutter/blade, nose pliers, computer set with internet facility, software & interface devices, set opener, ray detector, liquid cleaner, jumper wire, frequency counter, oscilloscope, hot air gun, infrared gun, insulating tape, heat sink, double tape, number tag, de-soldering wire, needle, wire cutter, suction pump, smooth file, microscope, UV light, UV mask, hot plate, SIM injector, screen separator, DC power supply source, pen, paper, register, stapler, bill pad, job sheet, first aid kit, feedback form, fire extinguisher and personal protective equipment (PPE).	
7	**Safety and Hygiene (Occupational Health and Safety):** • Apply Personal Protective Equipment (PPE). • Safe handling of tools, equipment and materials. • Prevent from electrical hazards. • Prevent from chemicals, fumes and radiation. • Maintain ergonomic posture.	

	• Maintain illumination at workplace. • Keep workplace dry and clean.

8	Required Knowledge		
	Technical Knowledge	**Applied Calculation**	**Graphical Information**

	• Tools, equipment and materials
	  ○ Types
	  ○ Uses
	  ○ Safe handling
	• Electrical parameters
	  ○ Voltage
	  ○ Current
	  ○ Resistance
	  ○ Continuity
	  ○ Power
	  ○ Frequency
	  ○ Capacitance
	  ○ Inductance
	  ○ Impedance
	• Basic electronic components and their function
	• Mobile phone/sets
	  ○ Brand
	  ○ Features
	  ○ Accessories and parts
	  ○ Assembling and dissembling
	  ○ Major sections/modules and their functions
	  ○ Major components and their functions
	  ○ Circuit diagram
		• Calculate material cost
		• Calculate service charge
		• Calculate repair cost
			• Read and interpret circuit diagram
			• Read and interpret service manual
			• Read and interpret technical specification
			• Read and interpret schematic diagram

	○ Operating system • Mobile frequency, band and generation • Mobile communication system (receiving, transmission) • Printed Circuit Board (PCB) ○ Introduction ○ Components/parts ○ Circuit diagram ○ Protection circuit • Types of electrical circuit • Testing procedure ○ Component test ○ Cold test ○ Hot test • Types of integrated circuit (IC) and their function • History taking technique • Engineering mode code • Power on test • Visual inspection • Feedback collection technique • Costing and estimation • Chemical wash • Methods of soldering, de-soldering and heating • Types of display and touch pad • Types of connectivity and their function • Types of sensors and their function		

	• Types of memory and their function • Resolution and picture quality • Methods of troubleshooting • Fault documentation • Wireless charging • Electrostatic Discharge (ESD), its purpose and precaution • Occupational health and safety		

9	**Assessment of Competency**					
	Unit: 1 **Unit Title: Repair hardware faults**					
	Candidate Details			**Assessors Detail**		
	Candidate's Name: Registration Number: Symbol No: Test Centre: Test Date:			Assessors' Name 1. 2. 3.		ID/License No:
Element of competency	**Performance Standards**		**Standard Met**	**Standard Not Met**	**Evidence Type**	**Comments**
1.1 Take mobile history	1.1.1 Customer greeted and welcomed in accordance with organization practice. 1.1.2 ***Information*** collected related to faulty mobile phone. 1.1.3 ***Personal*** and ***mobile details*** clearly mentioned in job sheet. 1.1.4 Fault/problem clearly mentioned in job sheet.					
1.2 Diagnose mobile faults	1.2.1 ***Engineering mode codes*** used to identify hardware fault. 1.2.2 ***Personal protective equipment (PPE)*** used in accordance with task requirements. 1.2.3 Mobile phone set dismantled without damaging circuit/components. 1.2.4 Mobile phone visually inspected for ***physical damage***. 1.2.5 Cold and hot testing performed on printed circuit board (PCB).					

	1.2.6 ***Electronic components*** checked and verified with service manual/schematic diagram. 1.2.7 ***Electrical parameters*** tested and verified with service manual/ schematic diagram. 1.2.8 Faulty ***components or sections/modules*** identified interpreting the test results.				
1.3 Estimate cost	1.3.1 Mobile faults listed with spare parts required for repair. 1.3.2 Cost of repair calculated including material cost and service charge. 1.3.3 Customer informed about estimated cost for repair and risk factor. 1.3.4 Customer approval obtained prior to repair work.				
1.4 Repair faulty components and sections/modules	1.4.1 Moisture, dust, rust/corrosion removed from mobile housing and PCB. 1.4.2 PCB checked for physical damage. 1.4.3 PCB traced as per schematic diagram. 1.4.4 Open/short circuit repaired through soldering, de-soldering and jumpering. 1.4.5 Solder joints melted without damaging circuit/components. 1.4.6 Components removed and new components placed and fixed at specified location as per the specification.				
1.5 Replace faulty components	1.5.1 Spare components/module collected as per technical/model specification of faulty components/module. 1.5.2 Faulty components/module removed without damaging circuit/components.				

	1.5.3 New components placed and fixed at specified location as per the specification.				
1.6 Perform testing	1.6.1 Repaired components checked for working condition. 1.6.2 Mobile set re-assembled without damaging circuit/components. 1.6.3 Mobile set checked for functioning. 1.6.4 Mobile fault documented as per organization process. 1.6.5 Customer informed on handling of mobile safely.				
1.7 Clean work area	1.7.1 Tools and equipment cleaned, maintained, stored and record updated. 1.7.2 Work area cleaned and waste disposed in accordance with ***3R's principle***.				

WT- Written Test **OQ**- Oral Question **PT-** Practical Test **DO** – Direct Observation **SR**- Supervisor's report **SN**–Simulation

RP- Role Play **PG –**Photographs **VD**- Video **CT** – Certificates **TS** – Testimonials (Reward) **PP** – Product Produced

CS – Case Study

Range Statement

Variable	Range
Information	*May include but not limited to:* • Cause of malfunctioning • Model number
Personal details	*May include but not limited to:* • Name • Address • Contact number • Mobile security status
Mobile details	*May include but not limited to:* • IMEI number • Serial number • Physical status

Engineering mode codes	*May include but not limited to:*
	• Diagnostic code
	  ○ Display
	  ○ Touch
	  ○ Audio/vibration
	  ○ Camera
	  ○ Sensor
	• IMEI

Personal protective equipment	*May include but not limited to:* • Apron • Mask • Gloves • Goggles • Anti-static wrist band • Anti-static slipper • Solder fume extractor/absorber
Physical damage	*May include but not limited to:* • Moisturized • Broken • Crack • Scratch • Burn • Liquid damage
Electronic components	*May include but not limited to:* • Conductor • Semi-conductor • Insulator
Electrical parameters	*May include but not limited to:* • Voltage • Current • Resistance • Continuity

	• Power • Capacitance • Inductance • Impedance • Connectivity • Frequency/signal
Components or section/modules	*May include but not limited to:* • Display/digitizer unit: Display (LCD, OLED, AMOLED, Super AMOLED, P-OLED, F-OLED, TFT, digitizer), flex cable, sub board, connector, sensor, IC, coil, diode, touch pad screen, switch, touchpad IC, CPU, protection components • Power supply unit: Battery, power switch, connector, circuit, IC, charger, fuse, flex cable • Network section: Antenna, switch, oscillator, filter, amplifier, IC • Connectivity section: WiFi, Infrared, data cable, bluetooth, NFC, GPS, OTG/USB cable • Biometrics section: Face, Finger, IRIS scanner • Charging section: Charger, fuse, diode, capacitor, connector, resistor, VDR/TDR, IC • Audio/vibration unit: Speaker, vibrator, microphone, jack, connector, socket, IC • Keypad section: Keypad, connector, flex, switch, IC • SIM/memory interface unit: Tray, connector, holder, IC, memory module, socket, switch • Sensor unit: magnetic, thermal, gyroscope, proximity, ambient light sensor, accelerometer compass, hall effect sensor, barometer, posture sensor, infrared • Camera unit: Camera module, connector, flex cable, flash light, IC

3R's principle	*May include but not limited to:* • Reduce • Reuse • Recycle

5	**Unit No: 2** **Unit Title: Troubleshoot software problems**	**Unit code:**
	Elements of competency	**Performance standards**
	2.1 Identify fault	2.1.1 ***Information*** collected related to faulty mobile phone. 2.1.2 ***Engineering mode codes*** used to identify software issues. 2.1.3 Mobile set visually inspected and operation checked as per technical specification. 2.1.4 ***Software issues/problems*** identified interpreting the test results. 2.1.5 ***Personal and mobile details*** clearly mentioned in job sheet along with software issues/problems.
	2.2 Estimate cost	2.2.1 Software issues/problems to be resolved listed for repair. 2.2.2 Cost of repair calculated including service charge. 2.2.3 Customer informed about estimated cost for repair and risk factor. 2.2.4 Customer approval obtained prior to repair work.
	2.3 Perform flashing	2.3.1 ***Mobile phone management software/device*** prepared and connected in accordance with ***operating system (OS)***. 2.3.2 Mobile phone connected to phone management software/interface device. 2.3.3 Device driver installed as per brand and CPU types and connectivity checked. 2.3.4 Data backed up and restored. 2.3.5 Firmware selected and installed as per model specification. 2.3.6 Mobile phone checked for working condition.
	2.4 Install operating system	2.4.1 Mobile phone management software/device prepared and connected in accordance with operating system (OS). 2.4.2 Mobile phone connected to phone management software/interface device. 2.4.3 Device driver installed as per brand and CPU types and connectivity checked. 2.4.4 Data backed up and restored after OS installation. 2.4.5 Firmware selected and installed as per model specification. 2.4.6 Mobile phone checked for working condition. 2.4.7 OS updated after installation.

	2.5 Unlock mobile set	2.5.1 ***Authentic documents*** collected from customer. 2.5.2 ***Lock type*** identified. 2.5.3 System prepared and connected to server/device as per lock type. 2.5.4 Data backed up and restored after unlocking. 2.5.5 Mobile lock removed. 2.5.6 Mobile phone checked for working condition.
	2.6 Clean work area	2.6.1 Tools and equipment cleaned, maintained, stored and record updated. 2.6.2 Work area cleaned and waste disposed in accordance with ***3R's principle***.
6	**Task Performance Requirements (Tools, Equipment and Materials):** • Computer set with internet facility, multimeter, screw driver set, soldering iron, wire and paste, tweezers set, cleaning brush, booster machine (desktop charger), software & interface devices, connectivity cable, set opener, number tag, suction pump, jumper wire, DC power supply source, microscope, fire extinguisher, first aid kit and personal protective equipment (PPE).	
7	**Safety and Hygiene (Occupational Health and Safety):** • Apply Personal Protective Equipment (PPE). • Safe handling of tools, equipment and materials. • Prevent from electrical hazards. • Prevent from chemicals, fumes and radiation. • Maintain ergonomic posture. • Maintain illumination at workplace. • Keep workplace dry and clean.	

8	Required Knowledge		
	Technical Knowledge	**Applied Calculation**	**Graphical Information**

	• Tools, equipment and materials
	  ○ Types
	  ○ Uses
	  ○ Safe handling
	• Mobile phone/sets
	  ○ Brand
	  ○ Features
	  ○ Accessories and parts
	  ○ Assembling and dissembling
	  ○ Major sections/modules and their functions
	  ○ Major components and their functions
	  ○ Mobile frequency and channel/band
	  ○ Mobile communication system (receiving, transmission)
	• Introduction to mobile software
	• Use and importance of mobile operating system
	• Types of operating system
	  ○ IOS
	  ○ Android
	  ○ JAVA
	  ○ Windows
	• System file type
	• System update and downgrade
			• Read and interpret software device manual
			• Read and interpret circuit diagram
			• Read and interpret service manual
			• Read and interpret technical specification
			• Read and interpret schematic diagram

	• Interface device
	  ○ Setup
	  ○ Operation
	  ○ Update
	• Client/Server service
	• Application and utility software
	• Device driver
	• Software configuration
	• Types of security lock and their importance
	• Common software issues/problems
	• Mobile reset and formatting
	• Importance of data backup
	• Data privacy and security		

9	Assessment of Competency					
	Unit: 2 **Unit Title: Troubleshoot software problems**					
	Candidate Details		**Assessors Detail**			
	Candidate's Name: Registration Number: Symbol No: Test Centre: Test Date:		Assessors' Name 1. 2. 3.		ID/License No:	

Element of competency	Performance Standards	Standard Met	Standard Not Met	Evidence Type	Comments
2.1 Identify fault	2.1.1 ***Information*** collected related to faulty mobile phone. 2.1.2 ***Engineering mode codes*** used to identify software issues. 2.1.3 Mobile set visually inspected and operation checked as per technical specification. 2.1.4 ***Software issues/problems*** identified interpreting the test results. 2.1.5 ***Personal and mobile details*** clearly mentioned in job sheet along with software issues/problems.				
2.2 Estimate cost	2.2.1 Software issues/problems to be resolved listed for repair. 2.2.2 Cost of repair calculated including service charge. 2.2.3 Customer informed about estimated cost for repair and risk factor. 2.2.4 Customer approval obtained prior to repair work.				

2.3 Perform flashing	2.3.1 ***Mobile phone management software/device*** prepared and connected in accordance with ***operating system (OS)***. 2.3.2 Mobile phone connected to phone management software/interface device. 2.3.3 Device driver installed as per brand and CPU types and connectivity checked. 2.3.4 Data backed up and restored. 2.3.5 Firmware selected and installed as per model specification. 2.3.6 Mobile phone checked for working condition.				
2.4 Install operating system	2.4.1 Mobile phone management software/device prepared and connected in accordance with operating system (OS). 2.4.2 Mobile phone connected to phone management software/interface device. 2.4.3 Device driver installed as per brand and CPU types and connectivity checked. 2.4.4 Data backed up and restored after OS installation. 2.4.5 Firmware selected and installed as per model specification. 2.4.6 Mobile phone checked for working condition. 2.4.7 OS updated after installation.				
2.5 Unlock mobile set	2.5.1 ***Authentic documents*** collected from customer. 2.5.2 ***Lock type*** identified. 2.5.3 System prepared and connected to server/device as per lock type. 2.5.4 Data backed up and restored after unlocking. 2.5.5 Mobile lock removed. 2.5.6 Mobile phone checked for working condition.				

2.6 Clean work area	2.6.1 Tools and equipment cleaned, maintained, stored and record updated. 2.6.2 Work area cleaned and waste disposed in accordance with ***3R's principle***.				

WT- Written Test **OQ**- Oral Question **PT-** Practical Test **DO** – Direct Observation **SR**- Supervisor's report **SN**–Simulation

RP- Role Play **PG –**Photographs **VD**- Video **CT** – Certificates **TS** – Testimonials (Reward) **PP** – Product Produced

CS – Case Study

Range Statement

Variable	Range
Information	*May include but not limited to:* • Cause of malfunctioning • Model number

Engineering mode codes	*May include but not limited to:*
	• Diagnostic code
	  ○ Lock/unlock status
	  ○ Software version
	  ○ Warranty details
	• IMEI

Software issues/problems	*May include but not limited to:* • Software conflict • OS problems • Application crash • Compatibility issues • Security issues
Personal details	*May include but not limited to:* • Name • Address • Contact number • Mobile security status

Mobile details	*May include but not limited to:* • IMEI number • Serial number • Physical status
Mobile phone management software	*May include but not limited to:* • ODIN • Smart switch • Sony PC companion • LG bridge • I tunes
Device	*May include but not limited to:* • Miracle box • Ultimate Multi Tools • Z3X box
Operating system	*May include but not limited to:* • IOS • Android • Windows • JAVA
Authentic documents	*May include but not limited to:* • Citizenship • Identity card • Purchase bill • Warranty card

	• Serial number matching box
Lock type	*May include but not limited to:* • User lock • Account lock • Service provider lock
3R's principle	*May include but not limited to:* • Reduce • Reuse • Recycle