GSM PHONES MAINTENANCE AND REPAIRS

PREAMBLE

This syllabus is designed to assess candidates' basic skills of maintenance of mobile phones, in terms of knowledge and competence in fault finding and systematic repairs. It also assesses candidates' knowledge of setting up and managing a mobile phone maintenance and repair enterprise.

AIMS AND OBJECTIVES

The aims and objectives of the syllabus are to test candidates' knowledge and understanding of:

Basic concept and terminologies

Tracing, testing, trouble shooting, maintenance and repairs of mobile phones

Analyzing mobile phones PCB circuits

Different fault finding techniques

Using internet resources, data manuals, service manuals and trouble-shooting manuals

General safety precaution in mobile phones repair and maintenance

The requirement for setting up and successfully running a mobile phone maintenance and repair business

SCHEME OF EXAMINATION

There will be two papers - Paper 1 and Paper 2. The papers shall be a composite paper to be taken at one sitting.

PAPER 1: Will consist of 40 multiple choice objective questions to be answered in 45 minutes. The paper will carry 40 marks.

PAPER 2: Will consist of two sections, Sections A and B both lasting 1 ¾ hours and carrying a total of 100 marks.

Section A will comprise twelve essay questions. Candidates will be required to answer any ten of them in 55 minutes for a total of 60 marks.

Section B will comprise two questions on test of practical work for candidates to answer all in 50 minutes for 40 marks.

DETAILED SYLLABUS

CONTENT	NOTES
INTRODUCTION TO MOBILE PHONES AND SERVICE PROVIDERS Mobile phones acronyms and terminologies	Definition of mobile phones and its terminologies Terminologies should include GSM, CDMA, mobile phones/cell phones/user equipment, MMS, SMS, call barring, call forwarding, BSI, DCT, FPS etc.
Mobile phone bands and their uses	Band—single, double, tri and quad bands and their uses.
Types of mobile phones	Mobiles phone types—straight, flip, slides etc. and their special maintenance needs.
Phone accessories and their functions	All phone accessories including; headsets/hands free, earpiece, external Bluetooth, batteries, chargers, cables etc. and their functions.
Types of menus and sub-menus	Menus and sub-menus including; phone book, message, call, settings, applications etc. and their functions
Service providers and their codes	Major voice service providers and their service codes.
BASIC COMPUTER AND INTERNET CONCEPTS. Introduction to computer	Definition, identification and functions of various computer hardware (monitor, CPU, keyboard etc.) and software (operating and application) components.
Introduction to internet	Web access platform Including; WAP/GPRS/EDGE/Wi-Fi/3G etc.
Browsing the web	Browsing activities like downloading, uploading etc.
ESSENTIAL COMPONENTS OF MOBILE PHONES AND THEIR FUNCTIONS Structure of mobile phones	Basic block diagram (power unit, memory unit and radio unit) and functions of each block. Identification, description and functions of various hardware components including CPU, SIM socket, earpiece, keypad, buzzer, vibrator etc. Various software components both operating and application software.
Hardware components	Resistors, capacitors, diodes, transistors, IC, e.t.c.
Software components	Definitions, functions, reason, advantages and procedures (cleaning, soldering, de-soldering, re-balling etc.) of preventive and corrective maintenance Identify common tools and equipment for hardware repairs such as; star, Allen key, lead, precision set, multi-meter, oscilloscope, computer set soldering iron and sucker etc. and their uses.
MAINTENANCE AND REPAIR OF MOBILE PHONES	Identify common software tools for repair such as;

1 Electronic components in mobile phones	unlocking software, flashing software firmware installation etc.
2 Preventive maintenance	List safety rules and regulations. Safe use of maintenance tools. Basic safety facilities in the mobile phone workshop (first aid box, fire extinguishers etc.)
3 Corrective maintenance	
4 Common tools and equipment for hardware and software repairs.	Identification of hardware problems such as damaged screen, charging ports, mouthpiece, earpiece, keyboard etc. Identification of software problems such as; 'contact service provider', 'phone lock code', 'invalid SIM', 'SIM card rejected' etc.
5 Safety in mobile phone workshop	Dissembling and assembling, testing and trouble shooting of component such as displays, speakers, vibrators, ringers, charging ports, charging jacks, batteries, keypads, panels etc. Trouble shooting/fault finding using relevant mobile phone menus.
6 Common hardware problems	Identification of mobile phone ICs and electronic components. Reading of PCB circuit layout and schematic diagrams.
7 Common software problems	Identification of faulty components (using visuals, continuity test, open circuit, short circuit etc.) Test voltages on PCB (voltage levels at various points and voltage specification of IC pins)
TROUBLE-SHOOTING Basic trouble-shooting	Trouble-shooting techniques—metering methods, signal tracing/injection, component testing, visual inspections etc. Trouble shooting Surface Mount Devices (SMD)/ Ball Grid Array (BGA) etc.
	Use of software codes for faults finding. Fault find related to software (SIM locked, SIM rejected, hanging problem, restart problem etc.) Flashing of mobile phones—flashing devices, flashing software and their uses Phone lock/security unlocking/resetting counters
Tracing and fault finding in hardware	
	Capital, personnel and factors that determining choice of location Identify appropriate facilities/equipment for a mobile phone workshop. Risk analyses, costing, return on investment etc.

Fault finding in software **SETTING UP AND MANAGING MOBILE PHONE WORKSHOP** Setting up a mobile phone work shop Facilities/equipment for mobile phone workshop. Managing a mobile phone business	

SUPERVISED APPRENTICESHIP (INDUSTRIAL TRAINING)

Candidates are required to spend a minimum cumulative total of eight weeks of apprenticeship in an accredited repair and maintenance centre.

LIST OF MINIMUM ITEMS OF EQUIPMENT FOR A CLASS OF FIFTY CANDIDATES

ITEM NO	EQUIPMENT	QUANTITY REQUIRED	QUANTITY SEEN
1	Scrap mobile phone/Mobile phone parts	10	
2	Mobile phone manuals	10	
3	Mobile phone	50	
4	Chat of service codes	1	
5	Phones accessories (various types)	25	
6	Data cable (various types)	25	
7	Oscilloscope	2	
8	Multi-meter(Analog/digital)	10	
9.	Brush	25	
10	Soldering iron	10	
11.	Safety chart	1	
12.	Hammer	25	

13.	Spanner(various types)	25	
14.	Tweezer	10	
15.	PCB Board holder	25	
16.	Cutter	25	
17.	Magnifying desk lamp	10	
18.	Ultrasonic cleaner	1	
19.	Re-balling kits (Chat)	05	
20.	Flashing and unlocking devices	02	
21.	Cables and wires	Assorted	
22.	DC Regulated power supply	02	