

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:

1. Basic concept and terminologies
2. Tracing, testing, trouble shooting, maintenance and repairs of mobile phones
3. Analyzing mobile phones PCB circuits
4. Different fault finding techniques
5. Using internet resources, data manuals, service manuals and trouble-shooting manuals
6. General safety precaution in mobile phones repair and maintenance
7. 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** which shall be **composite** and will taken at one sitting.

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

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

Section A - Will comprise twelve short structured 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 both in 50 minutes for **40** marks.

Notes: The candidates are expected to have gone through an apprenticeship programme for a minimum of eight weeks with a reputable organization before sitting for the examination. A log book of work done and portfolio should be kept by the mentoring organization. This will constitute part of continuous assessment for the examination.

DETAILED SYLLABUS

CONTENT	NOTES
<p>A. INTRODUCTION TO MOBILE PHONES AND SERVICE PROVIDERS</p> <ol style="list-style-type: none"> 1. Mobile phones acronyms and terminologies 2. Mobile phone bands and their uses 3. Types of mobile phones 4. Phone accessories and their functions 5. Types of menus and sub-menus 6. Service providers and their codes <p>B. BASIC COMPUTER AND INTERNET CONCEPTS.</p> <ol style="list-style-type: none"> 1. Introduction to computer 	<p>Definition of mobile phones and its terminologies</p> <p>Terminologies should include GSM, CDMA, mobile phones/cell phones/user equipment, MMS, SMS, call barring, call forwarding, BSI, DCT, FPS etc.</p> <p>Band—single, double, tri and quad bands and their uses.</p> <p>Mobiles phone types—straight, flip, slides etc. and their special maintenance needs.</p> <p>All phone accessories including; headsets/hands free, earpiece, external Bluetooth, batteries, chargers, cables etc. and their functions.</p> <p>Menus and sub-menus including; phone book, message, call, settings, applications etc. and their functions</p> <p>Major voice service providers and their service codes.</p> <p>Definition, identification and functions of</p>

<p>2. Introduction to internet</p> <p>3. Browsing the web</p> <p>C. ESSENTIAL COMPONENTS OF MOBILE PHONES AND THEIR FUNCTIONS</p> <p>1. Structure of mobile phones</p> <p>2. Hardware components</p> <p>3. Software components</p> <p>D. MAINTENANCE AND REPAIR OF MOBILE PHONES</p> <p>1 Electronic components in mobile phones</p> <p>2 Preventive maintenance</p> <p>3 Corrective maintenance</p> <p>4 Common tools and equipment for hardware and software repairs.</p>	<p>various computer hardware (monitor, CPU, keyboard etc.) and software (operating and application) components.</p> <p>Web access platform Including; WAP/GPRS/EDGE/Wi-Fi/3G etc.</p> <p>Browsing activities like downloading, uploading etc.</p> <p>Basic block diagram (power unit, memory unit and radio unit) and functions of each block</p> <p>.</p> <p>Identification, description and functions of various hardware components including CPU, SIM socket, earpiece, keypad, buzzer, vibrator etc.</p> <p>Various software components both operating and application software.</p> <p>Resistors, capacitors, diodes, transistors, IC, e.t.c.</p> <p>Definitions, functions, reason, advantages and procedures (cleaning, soldering, de-soldering, re-balling etc.) of preventive and corrective</p>
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	<p>maintenance</p> <p>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.</p> <p>Identify common software tools for repair such as; unlocking software, flashing software firmware installation etc.</p>
5 Safety in mobile phone workshop	
6 Common hardware problems	<p>List safety rules and regulations. Safe use of maintenance tools. Basic safety facilities in the mobile phone workshop (first aid box, fire extinguishers etc.)</p>
7 Common software problems	<p>Identification of hardware problems such as damaged screen, charging ports, mouthpiece, earpiece, keyboard etc.</p> <p>Identification of software problems such as; ‘contact service provider’, ‘phone lock code’, ‘invalid SIM’, ‘SIM card rejected’ etc.</p>
E. TROUBLE-SHOOTING	
1. Basic trouble-shooting	<p>Disassembling and assembling, testing and trouble shooting of component such as displays, speakers, vibrators, ringers, charging</p>

	<p>ports, charging jacks, batteries, keypads, panels etc.</p> <p>Trouble shooting/fault finding using relevant mobile phone menus.</p> <p>Identification of mobile phone ICs and electronic components.</p> <p>Reading of PCB circuit layout and schematic diagrams.</p>
<p>2. Tracing and fault finding in hardware</p>	
<p>3. Fault finding in software</p>	<p>Identification of faulty components (using visuals, continuity test, open circuit, short circuit etc.)</p> <p>Test voltages on PCB (voltage levels at various points and voltage specification of IC pins)</p> <p>Trouble-shooting techniques—metering methods, signal tracing/injection, component testing, visual inspections etc.</p> <p>Trouble shooting Surface Mount Devices (SMD)/ Ball Grid Array (BGA) etc.</p> <p>Use of software codes for faults finding. Fault</p>

<p>F. SETTING UP AND MANAGING MOBILE PHONE WORKSHOP</p> <ol style="list-style-type: none"> 1. Setting up a mobile phone work shop 2. Facilities/equipment for mobile phone workshop. 3. Managing a mobile phone business <p>SUPERVISED APPRENTISHIP (INDUSTRIAL TRAINING)</p>	<p>find related to software (SIM locked, SIM rejected, hanging problem, restart problem etc.)</p> <p>Flashing of mobile phones—flashing devices, flashing software and their uses</p> <p>Phone lock/security unlocking/resetting counters</p> <p>Capital, personnel and factors that determining choice of location</p> <p>Identify appropriate facilities/equipment for a mobile phone workshop.</p> <p>Risk analyses, costing, return on investment etc.</p> <p>CANDIDATES ARE REQUIRED TO SPEND A MINIMUM CUMULATIVE TOTAL OF EIGHT (08) WEEKS OF APPRENTISHIP IN AN ACCREDITED REPAIR AND MAINTENANCE CENTRE</p>
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LIST OF MINIMUM ITEMS OF EQUIPMENT FOR A CLASS OF FIFTY CANDIDATES

ITEM NO	EQUIPMENT	QUANTITY REQUIRED	QUANTITY SEEN
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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	