



NATIONAL VOCATIONAL TRAINING INSTITUTE

TESTING DIVISION

TRADE TESTING REGULATIONS AND SYLLABUS

TRADE: COMPUTER HARDWARE SERVICING

LEVEL : CERTIFICATE ONE

TRADE TEST CERTIFICATE ONE

A. INTRODUCTION

- i. The review of this syllabus has been generally influenced by the demands of industries due to its continuous change as a result of technological advancement and the changing needs of society.

It was also influenced by the TVET reforms under the directions of the new educational reforms with the view to opening up further education and training opportunities to TVET graduates.

The certificate ONE syllabus is designed to respond to the following level descriptors:

QUALIFICATION	KNOWLEDGE LEVEL	SKILLS AND ATTITUDE:
Certificate 1	<ol style="list-style-type: none">1. To demonstrate a broad knowledge base incorporating some technical concepts.2. To demonstrate knowledge of the theoretical basis of practical skills.3. To demonstrate knowledge in numeracy, literacy, Information Technology and Entrepreneurial skills	<ol style="list-style-type: none">1. Require a wide range of technical skills2. Are applied in a variety of familiar and complex contexts with minimum supervision.3. Require collaboration with others in a team

- ii. This syllabus is aimed at providing trainees knowledge in memory management, upgrade of computer systems, system optimization, troubleshooting faults, repairs and servicing of computers, printers and uninterrupted power supply units in an organization or a set up.

B. GENERAL OBJECTIVES

On completion of this course, the trainee should be able to :

- i) understand the introduction to computer systems
- ii) understand and apply health and safety concept
- iii) understand how the computer works
- iv) understand and apply the principles of static electricity
- v) undertake hardware installation
- vi) the install hardware devices
- vii) install anti virus programs
- viii) Upgrade and maintain the concept of computer systems.
- ix) and interpret the electronic aspect of computer hardware
- x) understand print technology
- xi) understand and apply drawing, science and calculation for computer application

C. THE COURSE COMPONENTS

Trade Theory

Trade Science and Calculation

Trade Drawing

General Paper

Trade Practical

EXAMINATION: The candidates would be examined in the FIVE components listed in 'C' above.

Practical work must be carefully planned to illustrate application of the theory and to provide maximum opportunity for workshop practice, laboratory work and demonstration.

D. KNOWLEDGE AND SKILLS REQUIREMENT

The prime objective of the programme is to provide the skills of the trade in a manner that will best meet the needs of the trade as well as organization or set ups using computer systems.

E. ENTRY TO THE COURSE

Minimum education: Must have passed JHS or SHS examination. However, the selection of the students for the course is within the discretion of the head of the institution.

F. ELIGIBILITY FOR ENTRY TO EXAMINATION

Candidates may enter for examination only as internal candidate that is those who at the time of entry to the examination are undertaking (or have already completed the course at an approved establishment).

G. EXTERNAL EXAMINERS

The practical work of candidates will be assessed by an external examiner appointed by the Testing Commissioner.

I EXAMINATION

The components for the examination for Computer Hardware Certificate 1 are listed below:

1. Trade Theory
2. Trade Science and Calculation
3. Trade Drawing
4. General Paper
5. Trade Practical

J. EXAMINATION RESULTS AND CERTIFICATES

Each candidate will receive record of performance given the grade of performance for the components taken. These are:

- i) Distinction
- ii) Credit
- iii) Pass
- iv) Referred/Failure

Certificates would be issued to candidates who pass in all the components.

NOTE

All Technical and Vocational trainees who aspire to take advantage of the opportunities opened to them in the educational reforms should NOTE that for a trainee to progress to certificate Two (2) requires a pass In Certificate One (1).

J. ACKNOWLEDGEMENT

NVTI wishes to acknowledge the team of experts, for preparing the materials which have been incorporated into this syllabus.

Mr. Edwin Greenleaf Nkrumah (Bsc. IT)

Mr. Larry Opoku Oware (Diploma IT) in reviewing the whole materials and making necessary additions and recommendations is also appreciated.

Government's desire to improve the lot of Technical/Vocational Training, which led to the preparation of this syllabus, is hereby acknowledged.

K. RECOMMENDED TEXT BOOKS

1. PC upgrade and repair
2. Micro computer Technology
3. Com TIA Ax Essential

LIST OF TOOLS, EQUIPMENT

Soldering iron/sucker
Digital and analogue meters
PC Tool kit

CERTIFICATE ONE – TRADE THEORY

TASK		CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
1.0.	Introduction to Computers	Types of Computer System The uses of Computers	Types of Computer System: <ul style="list-style-type: none"> • Digital e.g laptop, Desktop, Tower etc. • Analogue e.g. thermometer etc. • Hybrid <u>Uses</u> Process, storage, research, communication, entertainment and creativity	<ul style="list-style-type: none"> • Display real objects/pictures of type of computer system
2.0.	Health and Safety	General Rules and Regulations	<u>Health</u> <ul style="list-style-type: none"> • Correct posture • Lifting stands • Protective devices (insulated materials) • Environment • First Aid (Application) <u>Safety</u> <ul style="list-style-type: none"> • Tools handling • Working procedure • Connectivity 	Demonstration and trainees activities
3.0.	How the Computer Works	Working principle of the computer system Input Processing Output	Computer System <u>Input</u> Keyboard Mouse <u>Processing</u> System Unit <u>Output</u> Monitor <u>Storage</u> Hard disk drive Memory Removable Disc	<ul style="list-style-type: none"> • Illustration with a chart (functional block diagram)

CERTIFICATE ONE – TRADE THEORY

TASK		CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
4.0.	Components of the Computer System Unit	Types of Computer system unit/casing and components.	<u>System Unit/Casing</u> Desktop Standard Slim line <u>Tower</u> Mini Midi Full <u>Components</u> Motherboard Adaptor cards Disk drives Power supply unit Memory Signal cables Processor	<ul style="list-style-type: none"> • Real Components Picture
5.0.	Computer Software and its Uses	The types of software packages The uses of each Software Package	<u>Software</u> <ul style="list-style-type: none"> • System Software • Application Software • Utilities Software <u>Uses</u> System Software <ul style="list-style-type: none"> • Controls, manages, gives an interface <u>Application Software</u> <ul style="list-style-type: none"> • Word processing • Spreadsheets • Databases • Graphic Designing • Desktop Publishing <u>Utilities</u> <ul style="list-style-type: none"> • Anti-virus • Diagnostic 	<ul style="list-style-type: none"> • Guide trainees to identify software packages and explain their uses

CERTIFICATE ONE – TRADE THEORY

TASK		CRITICAL-POINTS	SUB-POINTS	INSTRUCTIONAL TECHNIQUES
6.0.	Tools and Components	Introduction to Electronic Tools and Components	<p><u>Tools</u></p> <ul style="list-style-type: none"> • Screw drivers • Soldering iron • Analogue/digital meters <p><u>Components</u></p> <ul style="list-style-type: none"> • Resistors • Capacitors • Diodes • Transistors • (LED) Light Emmiting Diodes • Integrated circuits • Inductors 	<ul style="list-style-type: none"> • Show real object/care and maintenance of tools
7.0.	Introduction to Electronic Symbols/Diagrams	<ul style="list-style-type: none"> • Symbols • Diagrams 	<p><u>Symbols</u> Interpretation</p> <p><u>Diagrams</u> Reading of circuit diagrams</p>	<ul style="list-style-type: none"> • Demonstration with trainee activity
8.0.	Soldering and Desoldering	<p>Handling and Application of:</p> <ul style="list-style-type: none"> • Soldering iron • Sucker • Solder (Lead) 	<p><u>Application</u></p> <ul style="list-style-type: none"> • Handling • Soldering iron • Sucker • Fixing (Component) • Removing (Component) 	<ul style="list-style-type: none"> • Demonstration with trainee Activity
9.0.	Electricity	The Principles of Electricity	<p><u>Static</u></p> <ul style="list-style-type: none"> • Batteries • Magnetism <p><u>Current</u></p> <ul style="list-style-type: none"> • AC • DC 	<ul style="list-style-type: none"> • Show real object with trainee Activity

CERTIFICATE ONE – TRADE THEORY

TASK		CRITICAL-POINTS	SUB-POINTS	INSTRUCTIONAL TECHNIQUES
10.0	Virus	<ul style="list-style-type: none"> • Types • Prevention • Effects 	<p>The possible causes of virus:</p> <p><u>Types of virus</u></p> <ul style="list-style-type: none"> • Trojan horse • Horn • Bomb etc. <p><u>Prevention</u></p> <p>Anti virus program e.g Macfee, AVG, Norton etc.</p> <p><u>Effects</u></p> <p>Corrupts software Deleting of files Reducing performances Duplication of files etc.</p>	<ul style="list-style-type: none"> • Lecturing

CERTIFICATE ONE – TRADE SCIENCE AND CALCULATION

TASK		CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
1.0	Component Device	The basic knowledge for finding the total resistance and capacity	Calculate for the following: <u>Hard disk drive</u> <ul style="list-style-type: none"> • Cylinder • Heads • Sectors • Per-sector <u>Resistor</u> <ul style="list-style-type: none"> • Serial • Parallel • Networking <u>Capacity</u> <ul style="list-style-type: none"> Serial Parallel 	<ul style="list-style-type: none"> • Illustrate with the formula for determining the total capacity and resistance with trainees
2.0.	Logic Gates	The basic combinational of logic gates and its Boolean algebra	<ul style="list-style-type: none"> • AND • NAND • OR 	<ul style="list-style-type: none"> • Illustrate simple diagram and Boolean algebra to explain the logic gates
3.0.	Principles of Electricity	The basic principles of electricity	Calculation for: <ul style="list-style-type: none"> • Power • Voltage • Current 	<ul style="list-style-type: none"> • Assist trainees to work out Problems on power, voltage and current
4.0.	Binary Operation	<ul style="list-style-type: none"> • Conversions • Operations 	Conversions Base – Decimal Decimal – base <u>Operations</u> Addition (+) Subtraction (-) Division (÷) Multiplication (x)	<ul style="list-style-type: none"> • Working procedure, homework and assignment • Solving of problems

CERTIFICATE ONE – TRADE DRAWING

TASK		CRITICAL-POINTS	SUB-POINTS	INSTRUCTIONAL TECHNIQUES
1.0	Signal Cable	Integrated Drive Electronics Cable (IDE)	<u>Cable Parts</u> <ul style="list-style-type: none"> • Master (Boot device) • Primary (IDEI) • Slave (IDE) 	<ul style="list-style-type: none"> • Illustration/Chart/ Audio visual. Trainees practice in freehand sketching
2.0.	Signal Cable	SATA cable	<u>Cable Parts</u> Master board device Primary	<ul style="list-style-type: none"> • Illustration Chart Audio Visual display
3.0.	Motherboard	Free hand sketching of the motherboard with label	<u>Component parts</u> Industrial Standard Architecture (ISA) Peripheral Component Interconnection (PCI) ROM, BIOS chip, CMOS Battery	<ul style="list-style-type: none"> • Illustration/Chart/ Audio visual aid
4.0.	Hard Disk Drive	<u>Free hand</u> Sketching of the hard disk drive with cable	<u>Component Parts</u> <ul style="list-style-type: none"> • Casing • Controller • Data cache • Read/write head • Platters • Spindle 	<ul style="list-style-type: none"> • Illustration/Chart/ Audio visual aid
5.0.	The System Unit	Sketching the system unit and label the parts. <ul style="list-style-type: none"> • Tower • Desktop 	<u>Part to lable:</u> Front side Power switch CD-Rom The case <u>Back side</u> Power socket Serial/parallel parts Audio jack	<ul style="list-style-type: none"> • Real object or picture to sketch

CERTIFICATE ONE – TRADE DRAWING

TASK		CRITICAL-POINTS	SUB-POINTS	INSTRUCTIONAL TECHNIQUES
6.0	Input Device	Sketching the input device of the computer and label <ul style="list-style-type: none"> • Keyboard • Mouse 	<u>Keyboard</u> Function keys Numeric keys Alpha numeric keys Edit key Arrow key <u>Mouse</u> Primary button Secondary button Scroll button	<ul style="list-style-type: none"> • Real object or picture to Sketch
7.0	Output device	Sketching the output device of the computer with label <ul style="list-style-type: none"> • CRT • TFT 	<u>CRT/TFT</u> <ul style="list-style-type: none"> • Screen • Case • Switches 	<ul style="list-style-type: none"> • Real object or picture to sketch
8.0.	Memory	Free hand sketching of Memory <ul style="list-style-type: none"> • SIMM • DIMM with lable 	<u>Simm</u> 72 pin Lable <u>Dimm</u> 128 pin Label	<ul style="list-style-type: none"> • Audio visual aid/ Pictures/real object
1.0.	Computer Hardware and Peripherals	The categories of computer hardware and its peripherals Input Mouse Processing	<u>Components</u> <u>Inputs</u> Keyboard <ul style="list-style-type: none"> • Enhanced • Standard • Multipurpose <u>Mouse</u> <ul style="list-style-type: none"> • Serial • PS/2 • Optical • Cordless • Track ball 	<ul style="list-style-type: none"> • Lecture/Demonstration with Real Objects

		Output Peripherals	<u>Processing (System Unit)</u> <ul style="list-style-type: none"> • Desktop • Tower <u>Output</u> <ul style="list-style-type: none"> • Monitor • CRT (Sizes) • TFT (Sizes) <u>Peripherals</u> Input: Scanner, web cam Output: Speaker/Printer	
2.0.	Introduction to Windows Operating System	Versions/Operation and Fundamentals of Windows Operating System	<u>Versions</u> Windows 98, 2000, Me, XP, Vista etc <u>Operation with</u> Keyboard and mouse <u>Fundamentals</u> <ul style="list-style-type: none"> • The desktop • The start menu • The task bar • The window sidebar and gadgets 	Demonstration/ trainees activities
3.0	Working with Windows	The basic operation of the windows system and the use of the control panel	<u>Customizing</u> Menus (shortcuts) <u>Control Panel</u> <ul style="list-style-type: none"> • Create start up disk • Display properties • Scheduler • Add and remove program • Add hardware • Accessories 	Demonstration/trainee activities
4.0.	Working with Files and Folders	Creating of <ul style="list-style-type: none"> • Files • Folders 	Files/Folders: <ol style="list-style-type: none"> 1. Create 2. Open 3. Rename 4. Delete 5. Copy 6. Cut 7. Paste 	<ul style="list-style-type: none"> • Demonstration/trainees Activities
5.0.	Installation of Operating System	The methods and importance of Installing Operating System	<u>Operating System</u> Window 98, 2000, Me, XP etc.	<ul style="list-style-type: none"> • Demonstration/Trainee Activities

6.0.	Hardware Installation	Introduction to the BIOS set-up	Bios Set-Up <ul style="list-style-type: none"> • Configuration • Devices • Date • Time • Password etc. 	<ul style="list-style-type: none"> • Demonstration trainees activities
7.0.	Hardware Installation	The method of preparing a hard disk drive <ul style="list-style-type: none"> • Partition • Formatting 	Formatting a hard disk: <u>Partition</u> Low-level High-level Logical drive(s)	<ul style="list-style-type: none"> • Demonstration/preparing a hard Disk with trainees activities

CERTIFICATE ONE – TRADE PRACTICAL

TASK		CRITICAL-SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
8.0	Dismantling and Assembling of Computer	Principles and methods of Assembling and dismantling of computer	Assembling/ dismantling <ul style="list-style-type: none"> • The system unit • Keyboard • Mouse • Printer 	<ul style="list-style-type: none"> • Demonstration with real object/ Trainees activities
9.0.	Printer	The types of Printer <ul style="list-style-type: none"> • Impact • Non-impact • Installation of printer	Categories a) Impact <ul style="list-style-type: none"> • Dot matrix • Daisy wheel b) Non-impact <ul style="list-style-type: none"> • laser • inkjet Installation a) Software <ul style="list-style-type: none"> • Device drive • Setting as default b) Connectivity <ul style="list-style-type: none"> • Cables • Power supply 	<ul style="list-style-type: none"> • Lecturing with real object and Demonstrating the installation of printer with trainees activities

**LEVEL – CERTIFICATE ONE – TEST SPECIFICATION TABLE
DRAWING**

NO	TOPIC	COGNITIVE KNOWLEDGE	AFFECTIVE UNDERSTANDING	PSYCHOMOTOR APPLICATION	TOTAL
1.	Hard disk		2	3	5
22.	Memory		1	1	2
3.	Input and Output Devices		1	1	2
4.	System Unit		2	2	4
5.	Adapter Cards		2	3	5
6.	Signal Cables		1	1	2
7.	Motherboard		3	3	6

**LEVEL – CERTIFICATE ONE – TEST SPECIFICATION TABLE
SCIENCE AND CALCULATION**

NO	TOPIC	COGNITIVE KNOWLEDGE	AFFECTIVE UNDERSTANDING	PSYCHOMOTOR APPLICATION	TOTAL
1.	Binary Operation	1		1	2
2.	Logic Gates	1	1	1	3
3.	Components (Electronic)	1	1	1	3
4.	Devices (Hard Disk)	1	1	1	3
5.	Electricity	1	1	1	3

**LEVEL – CERTIFICATE ONE – TEST SPECIFICATION TABLE
TRADE THEORY (OBJECTIVES)**

NO	TOPIC	COGNITIVE KNOWLEDGE	AFFECTIVE UNDERSTANDING	PSYCHOMOTOR APPLICATION	TOTAL
1.	Introduction to Computer	1			1
2.	Health and Safety	1			1
3.	Storage Devices		1	1	2
4.	Hardware Installation	1	2	2	5
5.	Software Installation	1	2	2	5
6.	Print Technology		1	1	2
7.	How the Computer Works		1		1
8.	Viruses	1	1		2
9.	Troubleshooting and Repairs	1	1	1	3
10.	Electronics		1		1
	Upgrade and Maintenance		1	1	2
					25

**LEVEL – CERTIFICATE ONE – TEST SPECIFICATION TABLE
TRADE THEORY (SUBJECTIVES)**

NO	TOPIC	COGNITIVE KNOWLEDGE	AFFECTIVE UNDERSTANDING	PSYCHOMOTOR APPLICATION	TOTAL
1.	Storage Devices			1	
2.	Hardware Installation			1	
3.	Software Installation			1	
4.	Viruses				
5.	Troubleshooting			1	
6.	Upgrade and Maintenance			1	



NATIONAL VOCATIONAL TRAINING INSTITUTE

TESTING DIVISION

TRADE TESTING REGULATIONS AND SYLLABUS

TRADE: COMPUTER HARDWARE SERVICING

LEVEL: CERTIFICATE TWO

TRADE TEST CERTIFICATE TWO

A. INTRODUCTION

- i. The review of this syllabus has been generally influenced by the demands of industries due to its continuous change as a result of technological advancement and the changing needs of society.

It was also influenced by the TVET reforms under the directions of the new educational reforms with the view to opening up further education and training opportunities to TVET graduates.

The certificate TWO syllabus is designed to respond to the following level descriptors:

QUALIFICATION	KNOWLEDGE LEVEL	SKILLS AND ATTITUDE:
Certificate II	<ol style="list-style-type: none">1. To demonstrate broad knowledge base with substantial depth in area(s) of study.2. To demonstrate a command of analytical interpretation of range of data.3. To present results of study accurately and reliably.	<ol style="list-style-type: none">1. Needs varied skills and competencies in different tasks under various contexts.2. Require a wide range of technical and supervisory skills.3. Would be employed in different contexts.

- iii. The syllabus is aimed at providing advance knowledge in computer network, system optimization, memory management, installation(hardware and software), troubleshooting faults, repairs and servicing of computers, printers and uninterrupted power supply units in an organization or a set up.

B. GENERAL OBJECTIVES

On completion of this course, the trainee should be able to:

- i) understand the introduction to computer systems
- ii) health and safety concept
- iii) the history about computers
- iv) how the computer works
- v) principle of static electricity
- vi) hardware installation
- vii) computer software
- viii) computer viruses
- ix) upgrade and maintenance of computer system
- x) electronic aspect of computer hardware
- xi) understand printer technology
- xii) understand trade drawing, science and calculation

C. THE COURSE COMPONENTS

Trade Theory

Science and Calculation

Trade Drawing

Trade Practical

EXAMINATION: The candidates would be examined in the FIVE components listed in 'C' above.

Practical work must be carefully planned to illustrate application of the theory and to provide maximum opportunity for workshop practice, laboratory work and demonstration.

D. KNOWLEDGE AND SKILLS REQUIREMENT

The prime objective of the programme is to provide the skills of the trade in a manner that will best meet the needs of the trade as well as organization or set ups using computer systems.

E. ENTRY TO THE COURSE

Minimum education: Must have passed JHS or SHS examination. However, the selection of the students for the course is within the discretion of the head of the institution.

F. ELIGIBILITY FOR ENTRY TO EXAMINATION

Candidates may enter for examination only as internal candidate that is those who at the time of entry to the examination are undertaking (or have already completed the course at an approved establishment).

G. EXTERNAL EXAMINERS

The practical work of candidates will be assessed by an external examiner appointed by the Trade Testing Commissioner.

H. EXAMINATION

The components for the examination for Computer Hardware Certificate II are as listed below:

1. Trade Theory
2. Trade Science and Calculation
3. Trade Drawing
4. General Paper
5. Trade Practical

Certificates would be issued to candidates who pass in all the components.

I. EXAMINATION RESULTS AND CERTIFICATES

Each candidate will receive record of performance given the grade of performance for the components Taken. These are:

- i. Distinction
- ii. Credit
- iii. Pass
- iv. Referred/Failure

NOTE:

All Technical and Vocational trainees who aspire to take advantage of the opportunities opened to them in the educational reforms should NOTE that for a trainee to progress to certificate Two (2) requires a pass in Certificate One (1).

J. APPROVAL OF COURSE

Institutions or other establishments intending to prepare trainees for the Examination must apply to:

THE COMMISSIONER
TESTING DIVISION
NVTI HEAD OFFICE
P. O. BOX MB 21, ACCRA

K. ACKNOWLEDGEMENT

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L. RECOMMENDED BOOKS

PC upgrade and repair
Micro computer Technology
Com TIA Ax Essentials
Networking complete`

LIST OF TOOLS, EQUIPMENT

Soldering iron/sucker
Digital and analogue meters
Tool kit

CERTIFICATE TWO – TRADE THEORY

TASK		CRITICAL POINTS	SUB-POINTS	INSTRUCTIONAL TECHNIQUES
1.0.	Information Storage	Components of Hard disk drive	<u>Hard disk geometrics</u> Head Sectors Cylinders Landing zone Spinning motor Platters	<ul style="list-style-type: none"> • Audio visual display or real object
2.0.	Field Experience Assessment	Knowledge sharing	Field experience <ul style="list-style-type: none"> • Problem solving • Innovations 	<ul style="list-style-type: none"> • Discussion
3.0.	Central Processing Unit (CPU)	Understanding of: <ul style="list-style-type: none"> • Terminologies • Compatibility • Cooling system • Make up of the processor • Performance 	<u>Terminologies</u> Data bus Address bus Registers <u>Compatibility</u> Sockets (connection) <u>Cooling system</u> Heatsink Fan <u>Make-up</u> Intel AMD Pentium Celeron Performance Speed	<ul style="list-style-type: none"> • Diagram/chart/audio visual display

TASK		CRITICAL POINTS	SUB-POINTS	INSTRUCTIONAL TECHNIQUES
4.0.	Power control unit	The role of power control units Stabilizer	<u>Stabilizer</u> <ul style="list-style-type: none"> Fluctuation <u>Uninterrupted Power Supply (UPS)</u> <ul style="list-style-type: none"> Storage/Backup <u>Advantages</u> Stabilizer (Stabilizes voltage) <u>UPS</u> Storage (Stores energy)	<ul style="list-style-type: none"> Illustration with real objects/diagrams
5.0	Networking	Introduction Classification	<u>Introduction</u> Definition Classification Network topology Transmission medium Transmission techniques Access protocol	<ul style="list-style-type: none"> Illustration with pictures/diagrams/ audio visual aids

CERTIFICATE TWO – TRADE THEORY

TASK		CRITICAL POINTS	SUB-POINTS	INSTRUCTIONAL TECHNIQUES
6.0	Networking	Standards Protocols Classification	<u>Standards</u> Open System Interconnect (OSI) Physical Data link Network Transport Session Presentation Application <u>Protocols</u> Transmission Control Protocol (TCP) Internet Protocol (IP) Net Bios (NetBOI) File transmission Protocol (FTP)	<ul style="list-style-type: none"> • Illustration with pictures/diagrams/ audio visual aids

CERTIFICATE TWO – TRADE THEORY

TASK		CRITICAL POINTS	SUB-POINTS	INSTRUCTIONAL TECHNIQUES
10.0	Internet and Intranet Communication	Concept of <ul style="list-style-type: none"> • Internet • Intranet 	<u>Connection</u> Cable Wireless <u>Internet</u> Protocols and functions Hyper Text Transmission Protocol (HTTP) World Wide Web (WWW) Uniform Resource Located (URL) Transmission Control Protocol (TCP) Internet Protocol (IP) File Transfer Protocol (FTP)	<ul style="list-style-type: none"> • Demonstration with trainees activity
11.0	Computer Networking	Printer Sharing	Sharing a printer in a Local Area Network (LAN)	<ul style="list-style-type: none"> • Demonstration and trainees activity
12.0	Troubleshooting	General Rules Steps	<u>General rules</u> Don't panic Do the easy stuff first Reboot and try again <u>Steps</u> Check that everything is plugged in (connectivity) Check the software Check the hardware Check the external signs Run the diagnostics	<ul style="list-style-type: none"> • Illustration/demonstration and Trainee activity

CERTIFICATE TWO – TRADE SCIENCE AND CALCULATION

TASK		CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
1.0	Introduction to Number System	The basic knowledge of writing number system	Writing the following base number system Decimal Binary Hexadecimal Octal	<ul style="list-style-type: none"> • Illustrate on demonstration the base Knowledge of write number system
2.0.	Logic Gate	The basic combination of logic gates and their boolean algebra	Logic gates NOR NOT Ex-OR EX-NOR	<ul style="list-style-type: none"> • Illustrate with a simple diagram and their Boolean algebra to explain the logic gates.
3.0.	Principles of Electricity	The principles of electricity	Calculation for resistance in a circuit <ul style="list-style-type: none"> • Current • Voltage 	<ul style="list-style-type: none"> • Assist trainees to work out problem on resistance, current and voltage in a current

CERTIFICATE TWO – TRADE DRAWING

TASK		CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
1.0.	Local Area Network	Sketching the connection of local area network:. <ul style="list-style-type: none"> • Peer-to-Peer • Server-based 	Peer-to-Peer To work-station Server based <ul style="list-style-type: none"> • Two work-station • Server 	<ul style="list-style-type: none"> • Picture or chart to sketch
2.0.	Network Components	Sketching the network components and label <ul style="list-style-type: none"> • Switch • Hub 	<u>Switch</u> 12-port Indictors <u>Hub</u> 4-8 port hubs indicators	<ul style="list-style-type: none"> • Real object or chart to draw
3.0.	Router	Freehand sketching a router with label	<u>Label</u> Port Indicators	<ul style="list-style-type: none"> • Audio visual and/pictures/ real objects
4.0.	Modem	Free hand sketching an external modem with label	<u>Label</u> Port Indicators	<ul style="list-style-type: none"> • Audio visual and/pictures/ real objects
5.0.	Networking Topology	Freehand sketching of: <ul style="list-style-type: none"> • Bus topology • Ring topology • Star topology 	<u>Bus topology</u> Terminator Cable Workstation <u>Ring topology</u> Cable Workstation <u>Star topology</u> Cable Workstation Hub	<ul style="list-style-type: none"> • Audio visual aid/ pictures/ real objects

CERTIFICATE TWO - PRACTICALS

TASK		CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL ILLUSTRATIONSS								
1.0.	Health and Safety	<ul style="list-style-type: none"> • Hazard Control • First Aid Application • Safety precautions <p>Types of fire and the application of its tender</p> <p>Classes of fire tender</p>	<p>Hazard Control Risk in use of material Risk in use of equipment</p> <p>First Aid</p> <ul style="list-style-type: none"> • Application <p>Safety precautions</p> <ul style="list-style-type: none"> • Safe use of powered tools • Cables • Plugs <p>Fire</p> <table> <tr> <td>Causes:</td> <td><u>Classes</u></td> </tr> <tr> <td>Air</td> <td>A</td> </tr> <tr> <td>Friction</td> <td>B</td> </tr> <tr> <td>Material</td> <td>C</td> </tr> </table> <p>Fire tender</p>	Causes:	<u>Classes</u>	Air	A	Friction	B	Material	C	<ul style="list-style-type: none"> • Lecture/Demonstration with trainee activity
Causes:	<u>Classes</u>											
Air	A											
Friction	B											
Material	C											
3.0	Storage Devices	<p>Classification of storage devices:</p> <ul style="list-style-type: none"> • Hard disk • Compact Disk • Pen drive • Memory • Tape cartridge 	<p>Classify in terms of:</p> <ul style="list-style-type: none"> • Performance • Compatibility • Capacity • Reliability 	<ul style="list-style-type: none"> • Discussion with trainee activity 								
4.0.	Preparation of Hard Disk Drive	<p>Formatting/partitioning of a hard disk drive using a <u>diagnostic tool</u> or a <u>windows operating system</u></p>	<p>Formatting/partitioning</p> <p>Low level High level Logical drive/single drive</p> <p>Tool</p> <p>Diagnostic tool Windows Operating System</p>	<ul style="list-style-type: none"> • Demonstration with trainees activity 								

CERTIFICATE TWO - PRACTICALS

TASK		CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
5.0	Data Security	Method of securing data Security Back-up	Data <ul style="list-style-type: none"> • Password • Write protect • Attribute • Hide Backup <ul style="list-style-type: none"> • Daily • Weekly • Monthly 	Demonstration with trainees activity
6.0.	Memory Management	Types <ul style="list-style-type: none"> • ROM(Random access memory) • ROM(Read Only Memory) • Installation 	Types <ul style="list-style-type: none"> • Static • Dynamic Characteristics Speed Register Cache Bank <ul style="list-style-type: none"> • Single channel • Double channel Installation <ul style="list-style-type: none"> • Compatibility 	Demonstration with trainee activity
7.0.	Printer	Types Impact	Impact <ul style="list-style-type: none"> • Installation of device drivers • Print Manager • Deleting print job • Setting default • Replacing cartridge • Aligning print head. 	Demonstration with trainee activity

CERTIFICATE TWO - PRACTICALS

TASK		CRITICAL SKILLS	SUB-SKILLS	INSTRUCTIONAL TECHNIQUES
7.0.	Printer	<p>Non impact</p> <p>Configuration Control Board</p> <p>Mechanism</p>	<p>Non Impact</p> <ul style="list-style-type: none"> • Installation of device drivers • Printer manager • Deleting print default • Setting as default • Replacing cartridges <p>Control Board Power circuit Interface circuit</p> <p>Print Mechanism Print head assembly Ribbon Cartridges Paper feed Motor</p>	Demonstration with trainee activity
8.0.	Circuit Building	<p>Building a simple electronic circuit</p> <ul style="list-style-type: none"> • Digital • Analogue 	<p>Components</p> <ul style="list-style-type: none"> • Practical circuit board/spring board • Flexible wire • Transformer (12v-15v) • Resistor • Transistor • Capacitor • Diodes • Light emitting diodes (LED) 	Demonstration with trainee activity

**LEVEL – CERTIFICATE TWO – TEST SPECIFICATION TABLE
SCIENCE AND CALCULATION**

NO.	TOPIC	COGNITIVE/ KNOWLEDGE	AFFECTIVE/ UNDERSTANDING	PSYCHOMOTOR/ APPLICATION	TOTAL
1.	Logic Gates	3		3	
2.	Components (Electronic)	2		2	
3.	Devices (Hard Disk)	1		1	
4.	Electricity	2		2	

**LEVEL – CERTIFICATE TWO – TEST SPECIFICATION TABLE
DRAWING**

NO	TOPIC	COGNITIVE/ KNOWLEDGE	AFFECTIVE/ UNDERSTANDING	PSYCHOMOTOR/ APPLICATION	TOTAL
1.	Topology		3	3	6
22.	Peer to Peer Network		2	2	4
3.	Server Based Network		2	2	4
4.	Components		2	2	4
5.	Tools		2	2	4

**LEVEL – CERTIFICATE TWO – TEST SPECIFICATION TABLE
TRADE THEORY (OBJECTIVES)**

NO	TOPIC	COGNITIVE/ KNOWLEDGE	AFFECTIVE/ UNDERSTANDING	PSYCHOMOTOR/ APPLICATION	TOTAL
1.	Health and Safety	1			1
2.	Storage Devices		1		1
3.	Hardware Installation	1	2	1	4
4.	Software Installation	1	2	1	4
5.	Print Technology		2	1	3
6.	Introduction to Networking		2	1	3
7.	Protocols and Standards		2	1	3
8.	Memory Management		2		2
9.	Internet Concept		2		2
10	Electronics		2		2
					25

**LEVEL – CERTIFICATE TWO – TEST SPECIFICATION TABLE
TRADE THEORY (SUBJECTIVES)**

NO	TOPIC	COGNITIVE/ KNOWLEDGE	AFFECTIVE/ UNDERSTANDING	PSYCHOMOTOR/ APPLICATION	TOTAL
1.	Storage devices		1		
2.	Hardware Installation		1		
3.	Software Installation		1		
4.	Networking		1		
5.	Protocols and Standards		1		
6.			1		