REPUBLIC OF KENYA

NATIONAL OCCUPATIONAL STANDARD

FOR

COMPUTER SCIENCE TECHNICIAN

KNQF LEVEL 6

(CYCLE 3)

PROGRAMME ISCED CODE: 0613 554 A.

TVET CDACC
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ANALYSE COMPUTER ORGANISATION AND ARCHITECTURE

ISCED UNIT CODE: 0613 554 01A

UNIT CODE: ICT/OS/CS/CR/01/6/MA

UNIT DESCRIPTION

This unit covers the competencies required to understand Computer Organisation and Architecture. It involves understanding principles of computer organisation and design, understanding central processing unit functions, understanding computer memory functions, understanding input-output functions and understanding computer arithmetic and logic.

ELEMENT These describe the **key outcomes** which make up **workplace function**.	PERFORMANCE CRITERIA These are **assessable** statements which specify the required level of performance for each of the elements. **(Bold and italicized terms are elaborated in the range.)**
1. Apply principles of computer organization and design	1.1 ICT concepts are applied in relation to computer equipment 1.2 Principles of computer organisation are applied 1.3 Computer architecture is analysed and documented in terms of system performance 1.4 Structure and function of ***computer hardware components*** are identified
2. Analyse central processing unit functions	2.1 Peripheral devices are selected 2.2 The Central Processing Unit (CPU) is selected as per user requirements 2.3 CPU architecture is analyzed 2.4 Registers are analyzed 2.5 Instruction representation and execution are analyzed 2.6 ***CPU specifications*** are identified and selected as per user's requirements 2.7 CPU specifications are verified on a given computer system
3. Analyse computer memory functions	3.1 Memory organization is applied 3.2 ***storage technologies*** are applied 3.3 Cache and virtual memory are analysed 3.4 ***Memory specifications*** are selected as per user's requirements 3.5 Memory specifications are verified on a given computer system
4. Utilize input-output devices	4.1 Peripheral devices are installed 4.2 Input-output processing is analysed

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	4.3 Bus interface is applied 4.4 *Modes of data transfer* are analysed 4.5 *Input-output device specifications* are selected per user's requirements 4.6 Input-output device specifications are verified on a given computer system 4.7 Input-output processing is performed
5. Analyse computer arithmetic and logic	5.1 *Number systems* are identified and applied 5.2 Integer and floating-point representations are applied based on IEEE standards 5.3 Integer and floating-point arithmetic is applied 5.4 *Logic operators* are applied 5.5 Logic operations are applied 5.6 *Methods of representing logic operations* are applied

RANGE

This section provides work conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Computer hardware components	● Input devices ● Output devices ● Storage devices ● Central Processing unit (CPU)
2. CPU specifications may include but is not limited to:	● Brand ● Chipset ● Speed Series
3. Storage Technologies may include but is not limited to:	● Solid state ● Magnetic ● Optical
4. Memory specifications may include but is not limited to:	● Speed ● Size ● Form factor ● Type Part Number
5. Modes of data transfer may include but is not limited to:	● Programmed I/O ● Direct Memory Access I/O

	● Interrupt initiated I/O
6. Input-output device specifications may include but is not limited to:	● Monitor: Size, Resolution, Brand ● Printer/Copier: Function, Speed, Resolution, Brand ● Storage: Size, Brand, Data Transfer Rate
7. Number systems 8. may include but is not limited to:	● Decimal ● Positional ● Binary ● Hexadecimal
9. Logic Operators may include but is not limited to:	● AND ● OR NOT
10. Methods of representing logic operations may include but is not limited to:	● Karnaugh maps ● Logic gates ● Truth tables

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required skills

The individual needs to demonstrate the following skills:

- Communications (verbal and written);
- Time management;
- Problem solving;
- Planning;
- Decision Making;
- Research;

Required knowledge

The individual needs to demonstrate knowledge of:

- Fundamentals of ICT
- Principles of computer organisation and design
- Central Processing Unit functions
- Computer memory functions
- Input-Output functions
- Computer arithmetic and logic

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and understanding and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Identified Computer organization and architecture 1.2 Analyzed and documented Computer architecture in terms of system performance 1.3 Identified Structure and function of computer components 1.4 Selected Central Processing Unit (CPU) as per user requirements 1.5 Analyzed CPU architecture and register 1.6 Selected and verified memory specifications as per user's requirements 1.7 Analyzed Cache and virtual memory 1.8 Installed Peripheral devices 1.9 Analyzed Input-output processing 0 Analyzed modes of data transfer 1.11 1.12 Selected and verified Input-output device specifications as per user's requirements 1.13 Identified and applied Number systems 1.14 Applied integer and floating-point representations based on IEEE standards 1.15 Applied Integer and floating-point arithmetic 1.16 Applied Logic operations
2. Resource Implications	The following resources should be provided: 2.1 Access to relevant workplace where assessment can take place 2.2 Appropriately simulated environment where assessment can take place 2.3 Resources relevant to proposed activity or task
3. Methods of Assessment	Competency may be assessed through: 3.1 Oral questioning 3.2 Practical tests 3.3 Observation 3.4 Written test
4. Context of Assessment	Competency may be assessed 4.1 Off the job 4.2 On the job 4.3 During industrial attachment

5	Guidance information for assessment	5.1 Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.