AFRICA UNIVERSITY
A United Methodist-Related Institution

"Investing in Africa's Future"

COLLEGE OF ENGINEERING AND APPLIED SCIENCES (CEAS)

NCIS 306: COMPUTER ARCHITECTURE AND ORGANISATION

END OF FIRST SEMESTER EXAMINATIONS

NOVEMBER 2025

LECTURER: DR. TENDAI ZENGENI

TIME: 3 HOURS

INSTRUCTIONS

You are required to answer questions as instructed in each section

Start each question on a new page in your answer booklet

Answer 4 Questions **ONLY**

1. State the architectural differences between Windows and MacOS in terms of both hardware and software. **(25 marks)**

2. Draw and label a CPU, complete with input and output detailing how a process of writing a CV, editing it, correcting the format, deleting some text, adding some text, adding a picture, performing calculations, the instructions/ instruction set used until it is saved and printed.

(25 marks)

3. a) What is the difference between computer architecture and computer organization?

(5 marks)

b) What is virtual memory? Explain the need for virtual memory. **(5 marks)**

c) What are the main differences between a multi-processor system and a multi-computer system? **(5 marks)**

d) What is Cache? What are the different types of Cache? **(5 marks)**

e) What is RAM & ROM. Give different types of RAM and ROM. **(5 marks)**

4. a) Why are some programs or algorithms computationally infeasible today? **(4 marks)**

b) Define an algorithm **(3 marks)**

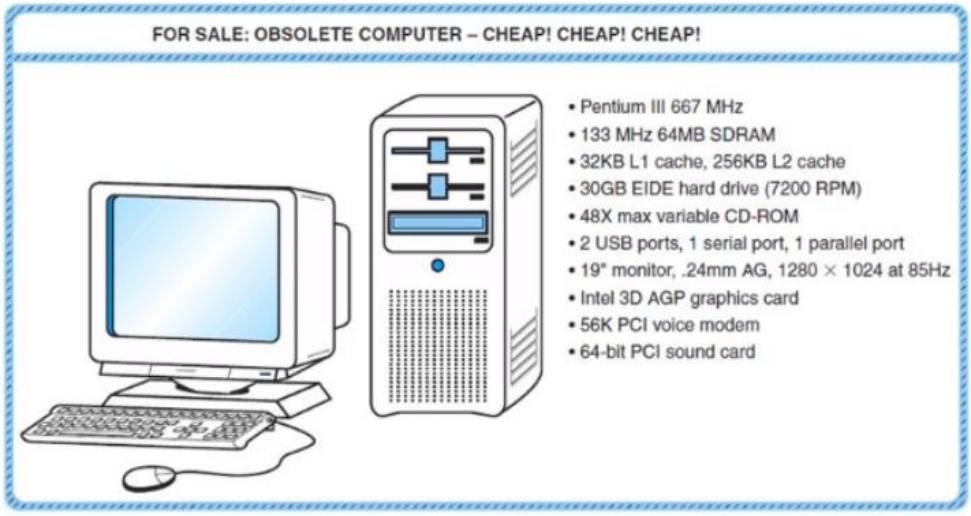
c) Discuss what these international organizations govern with regards to computing:

- IEEE **(4 marks)**
- ITU **(4 marks)**
- ISO **(4 marks)**

d) Discuss the function of Registers within a computer system. **(4 marks)**

e) Draw a Register and label it ? **(2 marks)**

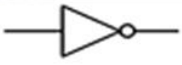
5. Look at this advertisement below and answer the questions



Look at the components of the computer in the advertisement and discuss the changes compared to today's computers. Discuss the evolution of the computer components in context with computers of today. **(25 marks)**

6. a) Fill in the table with the names of the logic gates. **(7 marks)**

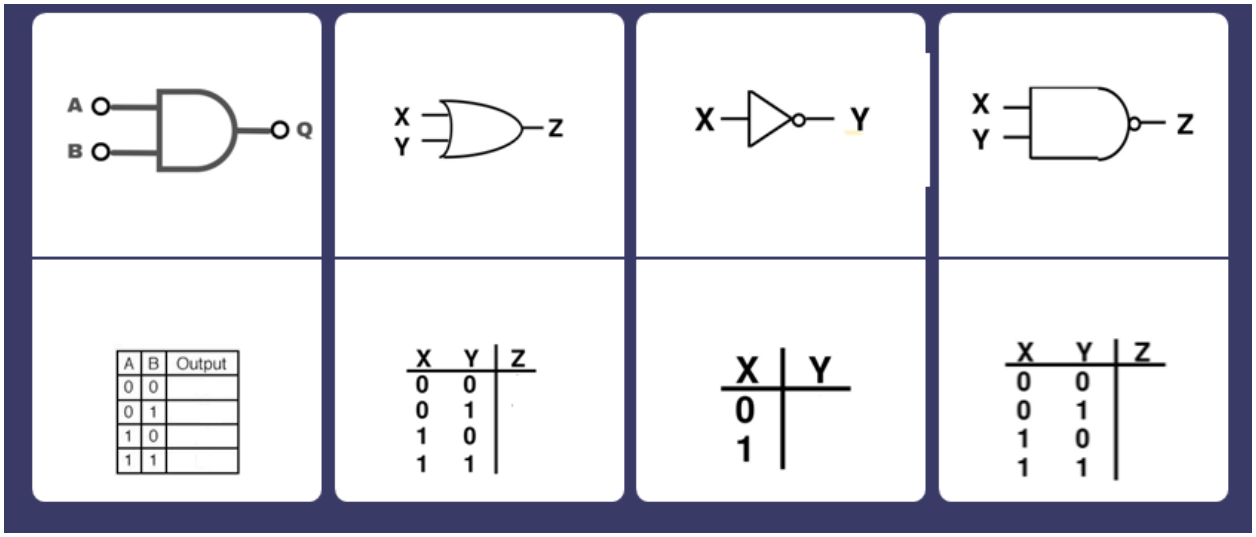
Logic Gate (AND, OR, XOR NOT, NAND, NOR & XNOR)

Logic Gate	Symbol
	

b) What is a logic gate ? **(3 marks)**

c) A typical digital computer system has four basic functional elements: (1) input-output equipment, (2) main memory, (3) control unit, and (4) arithmetic-logic unit. Elaborate and give examples. **(15 marks)**

7. Fill in the blanks for the output in the Boolean logic gates.

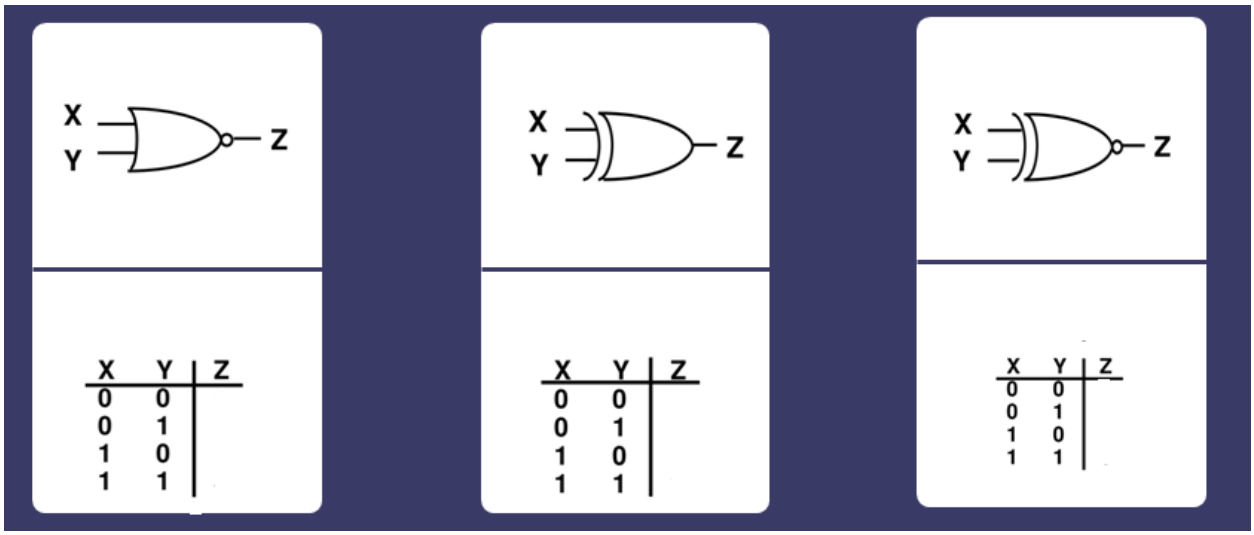


A	B	Output
0	0	
0	1	
1	0	
1	1	

X	Y	Z
0	0	
0	1	
1	0	
1	1	

X	Y
0	
1	

X	Y	Z
0	0	
0	1	
1	0	
1	1	



X	Y	Z
0	0	
0	1	
1	0	
1	1	

X	Y	Z
0	0	
0	1	
1	0	
1	1	

X	Y	Z
0	0	
0	1	
1	0	
1	1	

(25 marks)

END OF EXAMINATION