



PAC INSTITUTE OF TECHNOLOGY AND SOCIAL STUDIES MAY-AUGUST 2025 ASSESSMENT

FORMATIVE ASSESSMENT

Qualification : Computer Science Level 6
Code : ICT/OS/CS/CR/08/6/A
Unit of Competency : Understand Computer Organization and Architecture

WRITTEN ASSESSMENT TIME: 3 HOURS

INSTRUCTIONS TO THE CANDIDATE:

- 1. Read all the instructions carefully before attempting the questions.*
- 2. This paper consists of two sections, A & B.*
- 3. You are allowed 3 Hours to Answer the questions.*
- 4. Marks for each question are indicated in brackets.*
- 5. Write your responses in the Separate Answer booklet provided.*
- 6. Do not write anything on this question paper.*

SECTION A: (40 MARKS)

Answer ALL questions in this section.

1. Differentiate between **Computer Organization** and **Computer Architecture**. (4 Marks)
2. Highlight **two** basic components of a computer system. (2 Marks)
3. State two categories of peripheral devices (2 Marks)
4. Describe the two main types of internal memory categories? (2 Marks)
5. Define **Cache Memory**. (2 Marks)
6. Highlight two types of processors. (2 Marks)
7. Describe the purpose of the **Arithmetic and Logic Unit (ALU)** within the CPU. (4 Marks)
8. Outline four types of number systems. (4 Marks)
9. Convert the binary number 10112 to its decimal equivalent. (4 Marks)
10. Perform the binary addition: 1012+1102. (4 Marks)
11. Draw the truth table for a two-input **AND** logic gate. (4 Marks)
12. Outline two types of registers. (2 Marks)
13. State one example of a **logic operation**. (2 Marks)
14. Highlight the role of a **Bus interface** in I/O. (4 Marks)

SECTION B: (60 MARKS)

Answer any THREE questions in this section.

15.

- a) Explain the structure and functions of the basic components of a computer system. (10 Marks)
- b) Describe the three modes of data transfer: Programmed I/O, Interrupt-initiated I/O, and Direct Memory Access (DMA). Discuss the advantages and disadvantages of each. (10 Marks)

16.

- a) Discuss the different categories of internal memory, including their functions and standard specification factors. (10 Marks)
- b) Explain the operations of Cache Memory and Virtual Memory. How do they improve system performance? (10 Marks)

17.

- a) Describe the functions of the main components of the Central Processing Unit (CPU): ALU, Control Unit, and Registers. (10 Marks)
- b) Explain the Instruction Fetch-Execute Cycle in detail. (10 Marks)

18.

- a) Discuss the various types of number systems (Decimal, Binary, Octal, Hexadecimal) and their importance in computer arithmetic. (10 Marks)
- b) Perform the following integer arithmetic operations in binary. Show all steps:
 - i. Subtraction: $11012 - 1012$ (5 Marks)
 - ii. Multiplication: 1012×102 (5 Marks)