



**SCHOOL OF COMPUTING AND ENGINEERING SCIENCES  
BACHELOR OF BUSINESS & INFORMATION TECHNOLOGY, BACHELOR OF  
COMPUTER NETWORKS & CYBERSECURITY  
END OF SEMESTER EXAMINATION**

**BBT 2201/CNS 2202-COMPUTER ORGANIZATION & ARCHTECTURE**

**DATE: 15/12/2023**

**TIME: 13:00-15:00 HOURS**

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**INSTRUCTIONS**

- 1. This Examination consists of FIVE questions.**
- 2. Answer Question ONE (COMPULSORY) and any other TWO questions.**

**QUESTION ONE (30 MARKS)**

- a) Explain the following terminologies
  - i. Computer architecture **(2 Marks)**
  - ii. Instruction set **(2 Marks)**
- b) Elaborate the distinction between the following terminologies used in computer architecture
  - i. RISC and CISC **(4 Marks)**
  - ii. RAM and ROM **(4 Marks)**
- c) List **four** characteristics of Auxiliary Memory **(4 Marks)**
- d) Explain any **four** major features of fourth generation computers: **(4 Marks)**
- e) Convert Octal Number: 258 to its binary equivalent **(1 Marks)**
- f) Elucidate **10** components of a computer architecture system **(5 Marks)**
- g) Explain **four** functions of a digital computer **(4 Marks)**

**QUESTION TWO (15 MARKS)**

- a) Explain **five** elements of an instruction set **(5 Marks)**
- b) Describe **five** types of addressing modes with suitable diagrams and examples. **(10 Marks)**

### QUESTION THREE (15 MARKS)

- a) State **two** functions of the following **(4 Marks)**
- i. Arithmetic and Logic Unit
  - ii. Main memory
- b) Explain the purpose of the following registers **(6 Marks)**
- i. Instruction registers
  - ii. Program counter
  - iii. Memory buffer register
- c) Using a diagram describe the **five** characteristics of the intel 8085 architecture **(5 Marks)**

### QUESTION FOUR (15 MARKS)

- a) State and explain two types of buses **(2 Marks)**
- b) Explain **five** components of the bus design **(5 Marks)**
- c) Explain the following operation codes **(3 Marks)**
- i. ACI
  - ii. SUB-
  - iii. LDA
- d) Write an assembly code for 8-bit addition of two hexadecimal numbers using accumulator in 8085 **(5 Marks)**

### QUESTION FIVE (15 MARKS)

- a) Draw the logic gate diagram for the NOR and NAND operations **(2 Marks)**
- b) With a truth table show the implementation of the following logic circuits **(8 Marks)**
- i. AND gate
  - ii. NOT gate
  - iii. NAND gate
  - iv. OR gate
- c) Using a diagram describe the direct mapping cache organization technique **(4 Marks)**
- d) Convert the expressions 11101011102 to hexadecimal equivalent **(1 Mark)**