UNIVERSITY COLLEGE TATI

UNIVERSITY COLLEGE TATI (UCTATI)

FINAL EXAMINATION QUESTION BOOKLET	
COURSE CODE	: DCT 1043
COURSE	: COMPUTER ORGANIZATION AND ARCHITECTURE
SEMESTER/SESSION	: 2-2023/2024
DURATION	: 3 HOURS

Instructions:

1. This booklet contains **5** questions. Answer **ALL** questions.
2. All answers should be written in answer booklet.
3. Write legibly and draw sketches wherever required.
4. If in doubt, raise up your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 5 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

a) State **FOUR (4)** reasons why Hardware and Software related to each other on the computer components. (4 marks)

b) What is the function of the Arithmetic Logic Unit (ALU)? (2 marks)

c) Explain, why bus clocking is needed in the computer system? (4 marks)

d) List **FOUR (4)** types of computers. (4 marks)

QUESTION 2

a) Why binary system is needed, and how they are represented in computer system? (7 marks)

b) Convert the decimal number 76 to binary. (2 marks)

c) Convert 10101101_2 to its decimal equivalent (2 marks)

d) Convert 653_8 to its decimal equivalent. (2 marks)

e) Convert 1213_8 into decimal equivalent. (2 marks)

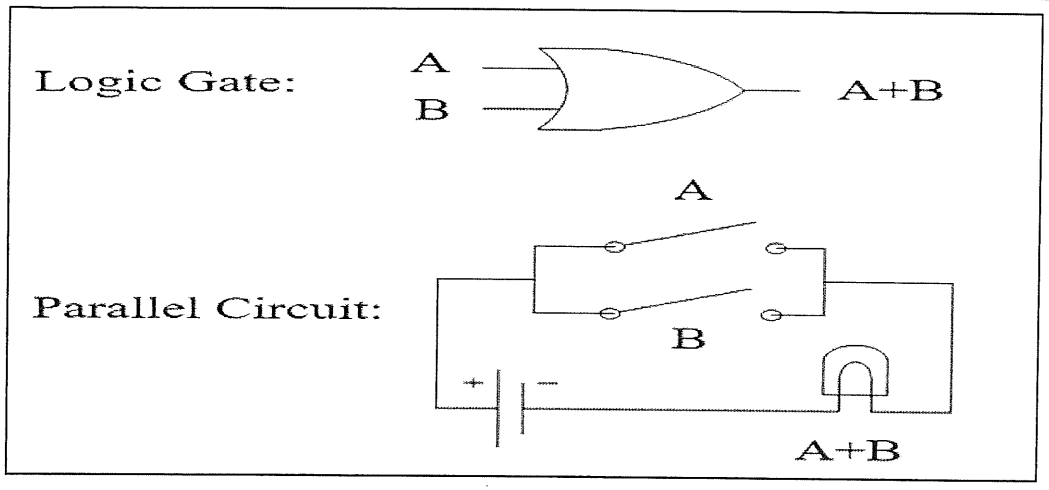
f) Convert the 10101 to base 10, base 8 and base 16 (6 marks)

QUESTION 3

a) Differentiate between Boolean algebra and Boolean variable. (4 marks)

b) Sketch the symbols for the AND, OR, NOT, NAND, NOR and XOR (6 marks)

c) Based on the Logic gate *OR* below, fill in the Truth Table based on the Parallel Circuit that has been provide. (4 marks)



Truth Table:

A	B	A+B
0	0	i
0	1	ii
1	0	iii
1	1	iv

d) Generalize about the Flip Flop operation. (3 marks)

e) Identify the **FOUR (4)** applications on the Boolean algebra and logic circuits that sits on the computer science area. (4 marks)

QUESTION 4

a) Explain the interaction between the computer processor towards the bus system concepts. (6 marks)

b) Generalize about the register concepts in the processor environment. (6 marks)

c) Why we need different architecture and technique on the computer components? (2 marks)

QUESTION 5

a) Explain the differences between volatile and non-volatile memory system. (4 marks)

b) Based on the Diagram 1 below, simplify the concepts on the MMU towards the physical address, device address and virtual address. (4 marks)

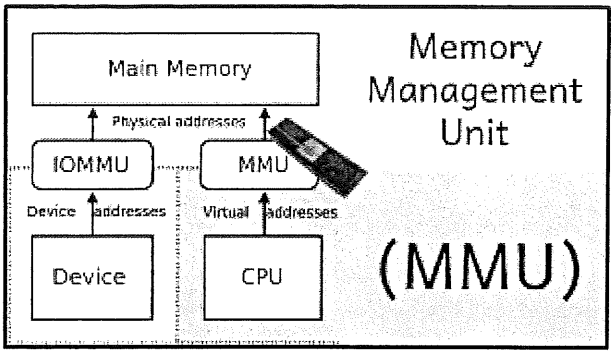


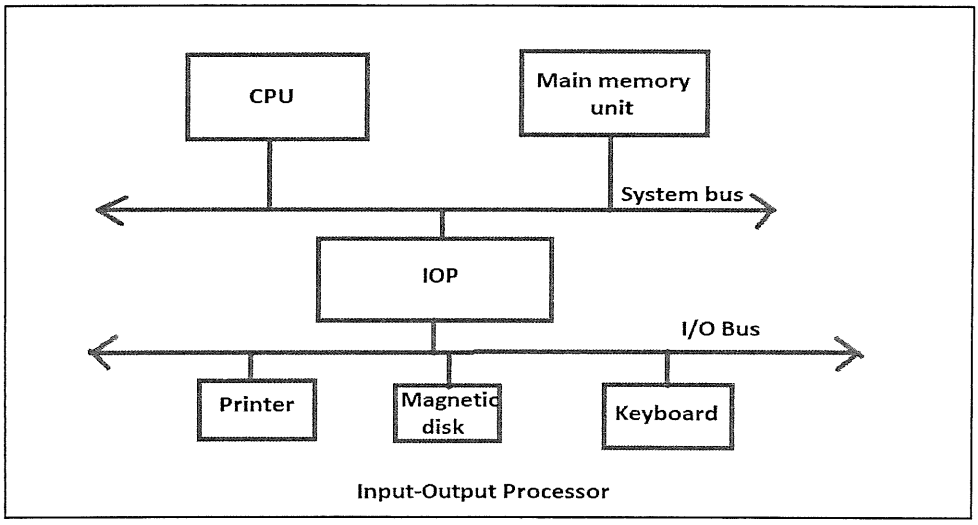
Diagram 1: Memory Management Unit (MMU)

c) List **FOUR (4)** example of computer memory specifically on the non-volatile memory and **THREE (3)** volatile memory. (7 marks)

d) How does a computer process input and output? (4 marks)

e) Classify examples, **TWO (2)** input and **TWO (2)** output devices. (4 marks)

f) From the schematic Diagram below, explain the I/O Processor starting from the CPU till input area. As can been seen, the system bus correlated to the I/O Bus. (7 marks)



Diagram

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