FINAL
ALTERNATIVE ASSESSMENT

(COVER PAGE)

Session	:	**April 2022**
Programme	:	Diploma in Computer Science (DCS)
Course	:	**DCS1102: Computer Architecture**
Date of Examination	:	August 6, 2022 (Saturday)
Time	:	4.00pm – 6.30pm Reading Time : Nil
Duration	:	2 Hours 30 Minutes

Special Instructions :

This paper consists of **FOUR (4)** structured questions. Answer **ALL** the questions. All questions carry equal marks.

Material permitted :

Non-Programmable Scientific Calculator

Materials provided :

Nil

Examiner(s)	:	**Ms Lusiana Syaiful** and Ms Nuur Shuhada Mohd Najib
Chief Moderator	:	Dr Vaithegy Doraisamy

*This paper consists of **4** printed pages, including the cover page*

DIPLOMA IN COMPUTER SCIENCE PROGRAMME (DCS)
DCS1102: COMPUTER ARCHITECTURE
FINAL ALTERNATIVE ASSESSMENT: APRIL 2022 SESSION

Instruction: This paper consists of **FOUR (4)** questions. Answer **ALL** questions. **Write ALL your answers** in the foolscap paper.

Question 1

(a) What is computer architecture and provide example in any scenario.
(4 marks)

(b) Describe the **FOUR (4)** main components of any general purpose computers.
(8 marks)

(c) Briefly explain the concept of memory mapping.
(3 marks)

(d) Convert 123.5432_{10} to hexadecimal value form.
(3 marks)

(e) Convert $C24CC.A9_{H}$ to decimal value form.
(5 marks)
[Total: 25 marks]

Question 2

(a) Briefly explain **THREE (3)** differences between register and main memory.
(6 marks)

(b) Briefly explain **TWO (2)** drawbacks of Programmed I/O and Interrupt driven I/O technique.
(6 marks)

(c) List **FIVE (5)** functions of I/O modules.
(5 marks)

(d) List any **FOUR (4)** addressing modes for instructions in Intel processors and give **ONE (1)** example of valid instruction for each of the addressing mode.
(8 marks)
[Total: 25 marks]

Question 3

(a) In computer technology, an opcode or operation code is part of a machine language instruction that specifies the operation to be performed. Apart from the opcode itself, an instruction normally also has one or more operands. There are instruction sets with nearly uniform fields for opcode and operands, as well as others with a more complicated, varied length structure.

(i) Explain the function of operands with an example.

(3 marks)

(ii) What is the primary advantage of fixed-sized instructions?

(3 marks)

(b) Compare **THREE (3)** criterions of Static Random Access Memory (SRAM) and Dynamic Random Access Memory (DRAM).

(9 marks)

(c) Given the register conditions :
AX = EA12H, BX=10ABH, CX= 3005H, DX=DFA6H

Find the status of the CF, PF, AF, ZF and SF for the following operations:

i. MOV BH, 3FH

ii. ADD BL, 2BH

iii. ADD BX, DX

iv. CMP AX, DX

(10 marks)

[Total: 25 marks]

Question 4

(a) Multiply 0111_2 by 0011_2.

(4 marks)

(b) Consider the following segment table:

Segment	Base	Length
0	219	655
1	3215	110
2	91	13
3	2215	299
4	875	183

What are the physical address for the following logical addresses?

i. 0, 411

ii. 2, 15

iii. 4, 181

(6 marks)

(c) The register content for an Intel 8086 microprocessor is as follows:

CS = 2000H, DS = 3000H, SS = 4000H, SI = 5000H, DI = 6000H
BX = 1A7bH, AX = C559H, CX = 3FA2H, DX = 2E22H, BP = 7000H

Calculate the physical address of the memory where the operand is stored and the contents of the memory locations in each of the addresses shown below:

i. MOV [SI], BH

ii. MOV [BP+19], AX

iii. MOV [SI+BX–2AH], BX

iv. MOV [DI][BX]+39H, AX

v. MOV [BP][SI]+10, DX

(15 marks)
[Total: 25 marks]

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