INTI International University & Colleges

FINAL
Examination Paper

(COVER PAGE)

Session	:	**APRIL 2019**
Programme	:	Diploma In Information And Communication Technology (DICTN) Diploma In Information Technology (DITN)
Course	:	**ICT2101: Computer Organization**
Date of Examination	:	29 July 2019, (Monday)
Time	:	11:00am – 1:00pm Reading Time : Nil
Duration	:	2 Hours

Special Instructions :

This paper consists of **SIX (6)** questions. Answer any **FOUR (4)** questions in the answer booklet provided.

Materials permitted : Nil

Materials provided : Nil

Examiner(s) : **Ryan Tee Ah Ann** and Neesha Jothy

Moderator : Mohd Faizal Bin Alias

*This paper consists of **5** printed pages, including the cover page*

DIPLOMA IN INFORMATION AND COMMUNICATION TECHNOLOGY PROGRAMME (DICTN)
DIPLOMA IN INFORMATION TECHNOLOGY PROGRAMME (DITN)
ICT2101: COMPUTER ORGANISATION
FINAL EXAMINATION: APRIL 2019 SESSION

Instructions: This paper consists of **SIX (6)** questions. Answer any **FOUR (4)** questions in the answer booklet provided. All questions carry equal marks.

Question 1

(a) In general terms, identify **FIVE (5)** principle differences between computer organization and computer architecture.

(5 marks)

(b) Briefly discuss the **FOUR (4)** main functions of a computer.

(8 marks)

(c) Describe the following terms:

i. Cache memory
ii. Bus
iii. Central Processing Unit (CPU)
iv. Computer Instruction Set
v. Control Bus
vi. Direct address

(12 marks)

Question 2

(a) Convert the following (without using calculator):

i. 10110101_2 to decimal
ii. 11110101_2 to decimal
iii. 213_{10} to binary
iv. 99_{10} to binary
v. $32F_{16}$ to decimal
vi. $C25_{16}$ to decimal
vii. 233_{10} to hexadecimal
viii. $B1A_{16}$ to binary
ix. 10101101_2 to hexadecimal
x. 01111010_2 to hexadecimal

(10 marks)

(b) Briefly explain the main function of a Bus Interface Unit (BIU) and an Execution Unit (EU).

(5 marks)

(c) Explain the following terms used for Intel 8086 Microprocessor with example(s):

i. PUSH
ii. POP
iii. Subroutines
iv. Software Interrupt

(10 marks)

Question 3

(a) Assume the following register conditions:

CF = 1 AX = $ABCD_H$ BX = $EF01_H$ DX = 2345_H

Perform the following operations. Indicate the result and the register where it is stored. The operations are independent of each other.

i. XOR AL, 79_H
ii. MOV CL, 4_H
ROR DX, CL
iii. OR BX, DX
iv. AND AX, BX
v. MOV CL, 3_H
RCL B_H, CL

(20 marks)

(b) Explain the following typical assembly language statements:

i. INC COUNT
ii. MOV TOTAL, 48
iii. ADD AH, BH
iv. AND MASK1, 128
v. ADD MARKS, 10

(5 marks)

Question 4

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

CS = 1000H, DS = 2000H, SS = 3000H, SI = 4000H, DI = 5000H
BX = 6080H, BP = 7000H, AX = 25FFH, CX = 8791H, DX = 1299H

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], AL
ii. MOV [DI+6H], BX
iii. MOV [SI+BX–8H], AX
iv. MOV [DI][BX]+28H, CX
v. MOV [BP][SI]+10H, DX

(20 marks)

(b) Discuss the purpose of flags register and list any **THREE (3)** flag registers.

(5 marks)

Question 5

(a) Explain **FOUR (4)** ways the operating system allocates computer memory.

(8 marks)

(b) Each virtual machine is an abstraction of the level below it. The machines at each level execute their own instructions, calling upon machines at lower levels to perform tasks as required. List and explain the **SEVEN (7)** levels in layered approach.

(14 marks)

(c) Identify the **THREE (3)** components of the Von Neumann architecture.

(3 marks)

Question 6

(a) There are two different design philosophy in processors, which are Complex Instruction Set Computer (CISC) and Reduced Instruction Set Computer (RISC). Differentiate any **FIVE (5)** characteristics of RISC and CISC.

(10 marks)

(b) Briefly explain any **THREE (3)** distinctive differences between cache memory and registers.

(6 marks)

(c) Identify and explain any **THREE (3)** I/O module functions.

(9 marks)

~ THE END ~

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