

 **INTI International
University & Colleges**

**FINAL
Examination Paper**

(COVER PAGE)

Session : JANUARY 2018

Programme : Diploma In Information And Communication Technology (DICTN)

Course : ICT2101: Computer Organization

Date of Examination : 3 March, 2018 (Saturday)

Time : 2:00 pm – 4:00 pm 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. All questions carry equal marks.

Materials permitted : Nil

Materials provided : Nil

Examiner(s) : Neesha

Moderator : Mohd Faizal Bin Alias

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

DIPLOMA IN INFORMATION AND COMMUNICATIONS TECHNOLOGY PROGRAMME
(DICTN)
ICT2101: COMPUTER ORGANISATION
FINAL EXAMINATIONS: JANUARY 2018 SESSION

Instruction: 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) Describe the following terms:

- (i.) Register indirect addressing mode
- (ii.) Immediate addressing mode
- (iii.) Instruction format
- (iv.) Instruction length
- (v.) Direct addressing mode

(10 marks)

(b) Explain I/O module functionalities in detail.

(15 marks)

(Total = 25 marks)

Question 2

(a) Convert the following:

- (i.) 10011_2 to decimal
- (ii.) 1101.101_2 to decimal
- (iii.) 25_{10} to binary
- (iv.) 0.0625_{10} to binary
- (v.) $4D_{16}$ to decimal
- (vi.) $FADE_{16}$ to decimal
- (vii.) 200_{10} to hexadecimal
- (viii.) 452_{10} to hexadecimal
- (ix.) 237_{16} to binary
- (x.) $11011011\ 01110110_2$ to hexadecimal

(20 marks)

- (b) Determine 2's complement of 01100101_2 . (1 mark)
 - (c) Subtract 01100101_2 from 128. (1 mark)
 - (d) Determine signed binary representation of 6_{10} in two's complement. (1 mark)
 - (e) Determine the decimal value of 01010000_2 . (1 mark)
 - (f) Solve $14_{10} - 20_{10}$ using 2's complement method. (1 marks)
- (Total = 25 marks)**

Question 3

- (a) Assume the following register conditions:

$AX = AB00_H$ $BX = 200C_H$ $CX = 3003_H$ $DX = DEFF_H$

Find the status of Carry Flag (CF), Parity Flag (PF), Auxiliary Flag (AF), Zero Flag (ZF) and Sign Flag (SF) for the following operations (the operations are independent of each other):

- (i.) $MOV\ BX,\ 3F_H$
 $ADD\ BL,\ 45_H$
 - (ii.) $ADD\ BX,\ DX$
 - (iii.) $CMP\ AX,\ DX$
 - (iv.) $NOT\ DX$
- (20 marks)
- (b) There are two separate processing units in 8086 microprocessor. Identify and explain the function of these two units. (5 marks)
- (Total = 25 marks)**

Question 4

(a) Comment on the validity of the following addressing modes:

- (i.) MOV AX, [1B4_H]
- (ii.) MOV [1F00_H], AX
- (iii.) MOV [1F00_H], [1B4_H]
- (iv.) MOV AX, [BP]
- (v.) MOV CX, [BX-21_H]
- (vi.) MOV DS, CS
- (vii.) MOV AL, 56DC_H[SI]
- (viii.) MOV AH, [DI][BP]
- (ix.) MOV AL, [SI+BX-1234_H]
- (x.) MOV DX, 10110101_b

(20 marks)

(b) The 8086 has 16 flag registers, and nine of it are active. Discuss any **TWO (2)** status flag registers.

(5 marks)

(Total = 25 marks)

Question 5

(a) In the fetch-decode-execute cycle, each pulse of the computer's clock is used to control one-step in the sequence. To speed up this process, pipelining is used. Describe this pipelining process.

(7 marks)

(b) Each virtual machine is an abstraction of the level below it. The machines at each level execute their own particular 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) List and explain the **TWO (2)** buses that connects to the system bus.

(4 marks)

(Total = 25 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 the characteristics of RISC and CISC. (10 marks)
- (b) Explain the concept of pipelining. (3 marks)
- (c) Explain **ONE (1)** advantage of pipelining. (3 marks)
- (d) A pipeline hazard is anything that disrupts orderly flow of data through the pipeline flow. List and explain **THREE (3)** types of pipeline hazards. (9 marks)
- (Total = 25 marks)**

~ The End ~

ict2101(f)/jan2018/formatted

