

FINAL
Examination Paper

(COVER PAGE)

Session : April 2016

Programme : Diploma in Information and Communication Technology (DICTN)

Course : ICT 2101: Computer Organization (Elective B)

Date of Examination : 29th July 2016, Friday

Time : 8.00am – 10.00am

Duration : 2 Hours Reading Time : Nil

Special Instructions :

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

IMPORTANT NOTE : THIS PAPER SHOULD NOT BE TAKEN OUT OF THE EXAMINATION HALL

Materials Permitted : Nil

Materials Provided : Answer Booklet

Examiner(s) : Ms. Kavitha A/P Thamadharan

Moderator : Mr. Mohd Faizal Bin Alias

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

DIPLOMA IN INFORMATION AND COMMUNICATION TECHNOLOGY (DICTN)
ICT2101: COMPUTER ORGANIZATION
FINAL EXAMINATION: APRIL 2016 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) Explain the **FOUR (4)** steps of data processing cycle. (8 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) Identify the **THREE (3)** components of the Von Neumann architecture. (3 marks)
- [Total = 25 marks]

Question 2

- (a) Show all workings clearly for the following:
- (i) Convert Decimal 208 to Binary (2 marks)
- (ii) Convert Decimal 129 to Binary (2 marks)
- (iii) Convert Hexadecimal F89A to Binary (2 marks)
- (iv) Convert Hexadecimal E6A2 to Binary (2 marks)
- (v) Convert Binary 10111101 to Decimal (2 marks)
- (b) Explain the differences between computer organization and computer architecture. (4 marks)
- (c) Explain the following terms using number system representation:
- (i) Bit (2 marks)
- (ii) Nibble (2 marks)
- (iii) Byte (2 marks)
- (iv) Word (2 marks)
- (v) Double Word (2 marks)
- (d) What do ASCII stands for? (1 mark)
- [Total = 25 marks]

Question 3

- (a) Demonstrate using binary how an 8bit two's complement computer system will perform the following:
- | | | |
|-------|---------|-----------|
| (i) | 94 – 51 | (5 marks) |
| (ii) | 81 – 23 | (5 marks) |
| (iii) | 76 – 18 | (5 marks) |
- (b) List and explain the **THREE (3)** buses that connects to the system bus. (6 marks)
- (c) Explain how the computer system translates an instruction from a high-level language to machine language and provide an example of high-level language and machine language. (4 marks)
- [Total = 25 marks]

Question 4

- (a) Assume the following register conditions:
 AX = ABCDh, BX = 200Ch, CX = 3003h, DX = DEFFh
- Find the status of Carry Flag (CF), Parity Flag (PF), Auxiliary Flag (AF), Zero Flag (ZF) and Sign Flag (SF) for the following operations:
- i. MOV BX, 4Fh
ADD BL, 25h
 - ii. CMP BX, CX
 - iii. NOT AX
 - iv. ADD AX, DX
- (20 marks)
- (b) Which of the register will you use to points at the segment containing the current program? (1 mark)
- (c) There are two separate processing units in 8086 microprocessor. Identify and explain the function of these two units. (4 marks)
- [Total = 25 marks]

Question 5

- (a) Explain the following types of addressing modes with example used in 8086 microprocessor programming: (8 marks)
- Immediate addressing
 - Register addressing
 - Direct addressing
 - Register indirect addressing
- (b) The register content for an Intel 8086 microprocessor is as follows:
 CS = 1000h, DS = 2000h, SS = 3000h, SI = 5000h, DI = 6000h,
 BX = 5080h, BP = 7000h, AX = 1234h, CX = 3615h, DX = 4715h
- Calculate the physical address of the memory where the operand is stored and the contents of the memory locations in each of the addresses as shown below:
- MOV [SI], AL
 - MOV [DI + 5h], BX
 - MOV [SI + BX - 6h], AX
 - MOV [BP][SI] + 10h, DX
- (8 marks)
- (c) Explain the input-output transfer operation and provide an example to support your explanation. (3 marks)
- (d) List and explain any **THREE (3)** types of input-output operation. (6 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]