

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
Department of Computer Science and Engineering (CSE)

MID SEMESTER EXAMINATION

WINTER SEMESTER, 2016-2017

DURATION: 1 Hour 30 Minutes

FULL MARKS: 75

CSE 4503: Microprocessors and Assembly Language**Programmable calculators are not allowed. Do not write anything on the question paper.**There are **4 (four)** questions. Answer any **3 (three)** of them.

Figures in the right margin indicate marks.

1. a) Why each memory slot of 8086 Microprocessor is of 8 bits, the data bus being of 16 bits? 4
 b) Figure out the offset address to locate physical address in the memory given below. 7
 Mention the formula. [Given, CS = 2450h]
 - i. 2460E
 - ii. 2450A
- c) Discuss unidirectional and bidirectional bus. Cite their examples. 2+2
 d) What type of addressing has been used in the following instructions? Name the types. 10
 - i. MOV AX, [0F3h]
 - ii. MOV [AX], BL
 - iii. MOV CX, BX
 - iv. MOV AX, 0FF0h
 - v. MOV AL, VM, where VM is a 8-bit variable.
2. a) What is meant by a 64-bit Microprocessor? [Hint : Mention Data & Address Bus] 2
 b) Define Microprocessor. Draw the bus cycle of READ operation with all the necessary control states. Explain the T-states. 1+10
 c) "Raspberry Pi is a Microcontroller" – Justify if the statement is true or false with the help of the definition of μC or μP . 3
 d) Draw the instruction template of the following - 8+1

MOV AX, [4A66_h]
3. a) Consider the following instructions:- 1+7

MOV AL, 01100111b
SHL AL, 4

 Show the final content of AL after the shift operation. Find the state of the following flag bits of the flag register based on the shift operation.
 i.e. CF, PF, AF, ZF, SF, OF, DF.
 - b) Draw the flag register and briefly discuss the functions of each flags. 10
 - c) Differentiate between NMI and INTR. 2
 - d) Figure out the time for one complete bus cycle of a microprocessor with 7, 14 and 20 MHz oscillators respectively. 5

- 4 a) What is Memory Segment? How Stack Segment is different from Code Segment and Data Segment? 6
- b) Write short note and usage with examples of **JMP**, **JLE**, **JNE** instructions. 6
- c) Analyze and find INPUT_PASSWORD of 7 letters to reach "LABEL_GOAL". 13

```
ORG 100H
.DATA
ST DB 'A','a','c','B'
INPUT_PASSWORD DB?,?,?,?,?,?,?

.CODE
MOV SI, OFFSET ST
MOV DI, OFFSET INPUT_PASSWORD
MOV CL,3
```

```
LOOP_1:
MOV DL,[DI]
CMP [SI],DL
JNE FAIL
INC SI
INC DI
LOOP LOOP_1
MOV CL,4
```

```
LOOP_2:
MOV DL,[DI]
CMP [SI],DL
JNE FAIL
INC DI
LOOP LOOP_2
```

```
LABEL_GOAL:
; GOOD JOB. YOU DID IT!
```

```
FAIL:
; You found a clue. Keep trying.
```