UNIVERSITY COLLEGE TATI

UNIVERSITY COLLEGE TATI (UC TATI)

FINAL EXAMINATION QUESTION BOOKLET	
COURSE CODE	: DMT 2103 / DEI 2103
COURSE	: FUNDAMENTAL OF MICROCONTROLLER
SEMESTER/SESSION	: 2 - 2022/2023
DURATION	: 3 HOURS

Instructions:

1. This booklet contains **4** questions. Answer **ALL** questions.
2. All answers should be written in answer booklet.
3. Write legibly and draw sketches wherever required.
4. If in doubt, raise up your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 7 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

a) Convert binary number into decimal number

(i) 1000100_2 (2 marks)

(ii) 1011110011_2 (2 marks)

b) State the different between microcontroller and microprocessor. (4 marks)

c) Show three (3) assembly instruction used in 8051 microcontroller. (3 marks)

d) Show the status of CY, AC and P flag after the addition of 38H and 2FH in the following instructions.

```
MOV A, #38H
ADD A, #2FH
```

(5 marks)

e) Show the description for the following assembler directives:

i) ORG (2 marks)

ii) END (2 marks)

iii) EQU (2 marks)

f) Name the following register bank based on **PSW.4** and **PSW.3** logic state.

Table 1

PSW.4	PSW.3	Bank
0	1	.....
1	0	.....
1	1	.....

(3 marks)

QUESTION 2

a) Write an assembly program to declare a following:

i) LED connected to pin P1.0 (2 marks)

ii) X=75 (2 marks)

iii) Switch connected to pin P3.3 (2 marks)

iv) Time=150 (2 marks)

b) List three (3) 8051 conditional jump assembly language instruction. (3 marks)

c) Write the description for the following jump instruction on Table 2.

Table 2

Instruction	Description
DJNZ	.....
JB	.....
JBC	.....

(3 marks)

d) Compute the delay generated from the program below. Given the Crystal frequency = 11.0592MHz.

```
DELAY:  MOV R2,#200
AGAIN:  MOV R3,#250
HERE:   NOP
        NOP
        DJNZ R3,HERE
        DJNZ R2,AGAIN
        RET
```

(5 marks)

e) Show the status of register 'A' and 'B' after the multiplication of 25H and 65H in the following instruction.

```
MOV A,#25H
MOV B,#65H
MUL AB
```

(4 marks)

QUESTION 3

a) Show the status of register 'A' and 'B' after the division of 95H and 10H in the following instruction.

```
MOV A,#95
MOV B,#10
DIV AB
```

(4 marks)

b) Produce an assembly program to add to number 12H and 23H. Then, subtract the result with 06H. After that, copy the final result into register R7, R6 and R5.

(6 marks)

c) Produce a program to add '3' ten times and save the result into variable x. Then, multiply it with '2' five times and save the result into variable y.

(8 marks)

d) List three (3) assembly language logic instruction for 8051 microcontroller.

(3 marks)

e) Show the result for the following program code:

i)
```
MOV A,#35H
ANL A,#0FH
```
(3 marks)

ii)
```
MOV A,#04H
ORL A,#68H
```
(3 marks)

iii)
```
MOV A,#54H
XRL A,#78H
```
(3 marks)

QUESTION 4

a) A two (2) switch (SPDT) is connected to pin P2.1 and P2.2 of AT89C51 and LED to pin P3.0. Produce a program to turn ON LED if the logic of both switches is LOW. LED is OFF when both switch is HIGH. Either one of the switches is HIGH, LED will blink with 100ms time delay.

(10 marks)

b) Illustrate the *basic circuit* schematic diagram of AT89C51 microcontroller. (*Use attached paper at the attachment*)

(5 marks)

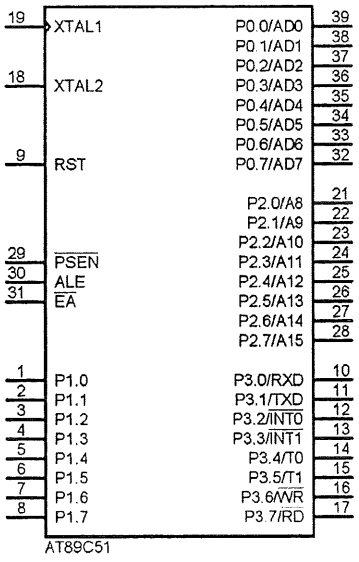
c) A switch (SPDT) is connected to pin P1.5 of AT89C51 and LED to pin P2.7. Produce a program to get the status of the switch and indicate it at LED.

(4 marks)

d) Give three (3) additional function at Port 3 of 8051 microcontroller. (3 marks)

----------End of question----------

ATTACHMENT 1 : Illustrate your answer for question 4.b)



ATTACHMENT 2 : CODE FORMATTING

Declaration

```
#define xxxx P2

sbit yyyy at P2_3_bit;

int zyzy;
```

Prototype

```
void xyxyx();
```

LCD

```
Lcd_Init();

Lcd_Cmd(_LCD_CLEAR);

Lcd_Cmd(_LCD_CURSOR_OFF);

LCD_Out(1,4,word1);
```

Others

```
void main()
{
   while(1)
   {

   }
}
------------------------------

if(suis==1)
{

}
else
{

}
------------------------------

for(int i=0; i>8; i++)
{

}
------------------------------

if(suis1==1)
{

}
if(suis2==1)
{

}
else
{

}
------------------------------

while(suis==0)
{

}
------------------------------
```