UNIVERSITY COLLEGE TATI

UNIVERSITY COLLEGE TATI (UC TATI)

FINAL EXAMINATION QUESTION BOOKLET	
COURSE CODE	: DMT 1023
COURSE	: PROGRAMMING 1
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.

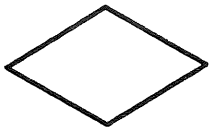
DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

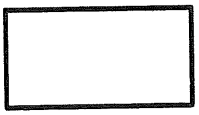
THIS BOOKLET CONTAINS 8 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

a) Identify the name of the following flowchart block:

i.  .....

ii.  .....

iii.  .....

(3 marks)

b) Write the possible number range for each data type below:

i. `sbit` (1 mark)

ii. `int` (1 mark)

iii. `unsigned char` (1 mark)

iv. `byte` (1 mark)

v. `unsigned int` (1 mark)

c) Define **"correct"** or **"wrong"** for each of the following number declaration.

i. `char led = 128;` ⟶ Correct / Wrong (1 mark)

ii. `byte lamp = 256;` ⟶ Correct / Wrong (1 mark)

iii. `int value = -41;` ⟶ Correct / Wrong (1 mark)

iv. `word i = 65536;` ⟶ Correct / Wrong (1 mark)

d) Write a name for each of the operators below.

i. ==

(1 mark)

ii. &&

(1 mark)

iii. !=

(1 mark)

iv. >=

(1 mark)

e) Write a declaration program for the following parameter:

i. LED at P1.7

(1 mark)

ii. Switch at P3.1

(1 mark)

iii. Eight LED connected to P1

(1 mark)

iv. Variable 'y' equal to 0 (zero)

(1 mark)

QUESTION 2

Given the following sequence in Table 1.

Table 1: LED Sequence after press switch 1

After switch 1 pressed	LED 1 (P1.1)	LED 2 (P1.2)	LED 3 (P1.3)
Turn ON for 1s then OFF	●	○	○
Turn ON for 1s then OFF	○	●	○
Turn ON for 1s then OFF	○	○	●
LED Moving Direction	→		

a) Based on condition in Table 1, write a program code to **turn ON** LED alternately after pressing the **switch 1 at P3.5** once by using the following method:

i. `if...else...` (11 marks)

ii. `do...while...` (9 marks)

NOTE:

- *All LED must be in OFF condition before pressing the switch 1 and after the process done.*
- *The cycle is continuously for this process*

QUESTION 3

Given the following sequence in Table 2.

Table 2: LED Sequence

	LED 8 P1.7	LED 7 P1.6	LED 6 P1.5	LED 5 P1.4	LED 4 P1.3	LED 3 P1.2	LED 2 P1.1	LED 1 P1.0
Turn ON for 500ms then OFF	●	○	○	○	○	○	○	○
Turn ON for 500ms then OFF	○	●	○	○	○	○	○	○
Turn ON for 500ms then OFF	○	○	●	○	○	○	○	○
Turn ON for 500ms then OFF	○	○	○	●	○	○	○	○
Turn ON for 500ms then OFF	○	○	○	○	●	○	○	○
Turn ON for 500ms then OFF	○	○	○	○	○	●	○	○
Turn ON for 500ms then OFF	○	○	○	○	○	○	●	○
Turn ON for 500ms then OFF	○	○	○	○	○	○	○	●
LED Moving Direction (After *Switch 1* pressed)	→							
LED Moving Direction (After *Switch 2* pressed)	←							

a) Write a program code to **turn ON** LED alternately (*as shown in Table 2*) after pressing the **switch 1 or switch 2** once at P3.4 and P3.5 by using `while`... method.

(8 marks)

b) Based on Table 2, the LED is **turn ON** alternately after pressing the **switch 1 or switch 2** once at P3.4 and P3.5.

i. Write a program code using `if`... method. (6 marks)

ii. Write a Function to turn ON LED sequence. (9 marks)

NOTE:

- *All LED must be in OFF condition before pressing the switch 1 or switch 2 or after the process done.*
- *The cycle is continuously for this process*

QUESTION 4

Given the following sequence in Table 3.

Table 3: LED Pattern

	LED 8 P1.7	LED 7 P1.6	LED 6 P1.5	LED 5 P1.4	LED 4 P1.3	LED 3 P1.2	LED 2 P1.1	LED 1 P1.0
Turn ON for 500ms then OFF	○	○	○	○	○	○	○	○
LED Moving Direction (After *Switch* pressed)								
LED Moving Direction (2nd *Pattern*)								
LED Moving Direction (3rd *Pattern*) – 3 times								

a) Illustrate the flowchart to **turn ON LED** based on LED moving direction given at Table 3 after pressing a **switch** once at P3.3.

(5 marks)

b) Based on LED ON moving direction given at Table 3, after pressing a **switch** once at P3.3:

i. Write a program using array method to complete the task. (24 marks)

ii. Write a function for each LED Pattern. (8 marks)

NOTE:

- *All LED must be in OFF condition before pressing the switch or after the process done.*
- *The cycle is continuously for this process.*

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

ATTACHMENT 1 : CODE FORMATTING

1. Declaration

```
#define xxxx P2
sbit yyyy at P2_3_bit;
int zyzy;
```

2. Array

```
int corak_1[]={0b00000001,
               0b00000010,
               0b00000100};
```

3. Prototype

```
void pattern_1();
```

4. Main Program

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

  }
}
```

5. If else

```
if(suis==1)
{
}
else
{
}
```

6. For loop

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

7. If, if

```
if(suis1==1)
{
}
if(suis2==1)
{
}
```

8. If, else if, else

```
if(suis1==1)
{
}
else if(suis2==1)
{
}
else
{
}
```

9. While loop

```
while(suis==1)
{
}
```

10. Do while loop

```
do
{
}
while(suis==1);
```

11. Function

```
void pattern_1()
{

}
```

ATTACHMENT 2 : Integral Data Type

TYPE	RANGE
bool	0,1 (false, true)
sbit	0,1
char	-128 to 127 (*'a','b' etc.*)
unsigned char	0 to 255 (*'a','b' etc.*)
byte	0 to 255
int	-32,768 to 32,767
unsigned int	0 to 65,535
word	0 to 65,535
long	-2,147,483,648 to 2,147,483,647
unsigned long	0 to 4,294,967,295
float	-3.4028235E+38 to 3.4028235E+38
double	(currently same as *float*)