UNIVERSITY COLLEGE TATI

UNIVERSITY COLLEGE TATI (UCTATI)

FINAL EXAMINATION QUESTION BOOKLET	
COURSE CODE	: FEP 1023
COURSE	: INTRODUCTION TO PROGRAMMING
SEMESTER/SESSION	: 3 - 2024/2025
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.

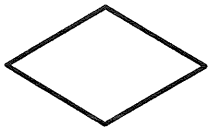
DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 11 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

a) Identify the name of the following flowchart block:

i.  ..... (1 mark)

ii.  ..... (1 mark)

iii.  ..... (1 mark)

iv.  ..... (1 mark)

b) Based on circuit diagram given at Figure 1, write declaration for each connected pin using **`#define`** method.

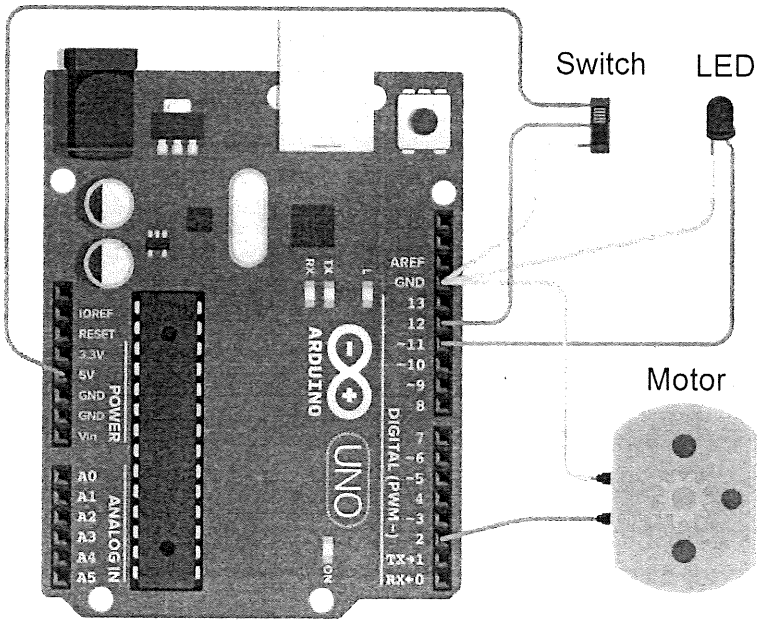


Figure 1: Circuit diagram of input and output component

(3 marks)

c) Use suitable '*Data Types*' to declare the following variable:

i. x = -1 (1 mark)

ii. *speed* = 128 (1 mark)

iii. *weight* = 15.3 (1 mark)

d) State the name for each of the operators below:

i. <= (1 mark)

ii. // (1 mark)

e) The program code given below has a syntax error. One (1) error has been identified (*circled*). Discover & circle another five (5) syntax error.

```
#define led = 9
unsigned char motor 3;

void setup()
{
  pinMode(led,OUTPUT);
  pinMode(Motor,OUTPUT);
{

void loop()
{
  digitalWrite(led,1);
  delay(1000;
  digitalWrite(motor,1);
  delay(1000);
}
```

(5 marks)

QUESTION 2

a) Based on flow chart given in Figure 2, produce a program code using `'while'` loop method.

(16 marks)

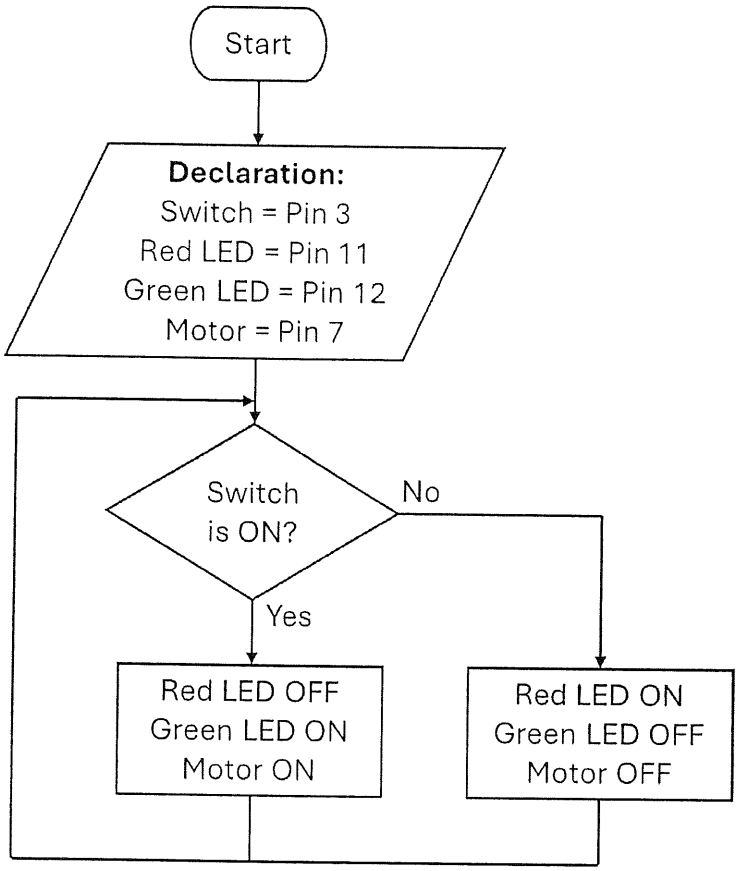


Figure 2

b) Produce a `'for'` loop program format to count from 0 until 99. (5 marks)

c) Based on flow chart given in Figure 3, produce a program code using `'if...if'` method. Pin connected are as follows:

- S1 at pin 10
- S2 at pin 11
- LED (D1) at pin 4
- LED (D2) at pin 5

(12 marks)

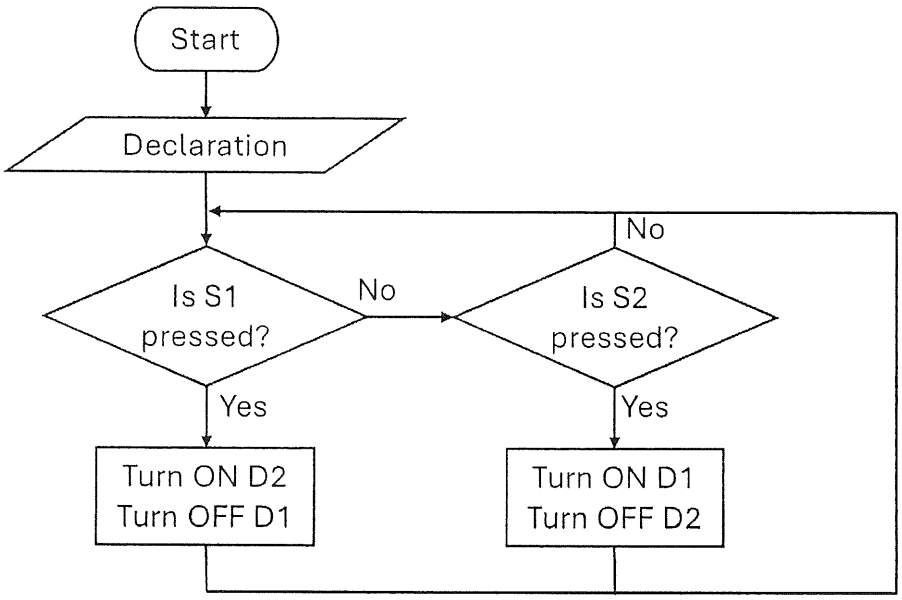


Figure 3

QUESTION 3

a) Based on array declaration given below, show the data stored (index value) for the *array* address shown at Table 1.

```
int pin[8]={5, 6, 7, 8, 9, 10, 11, 12};
int corak[]={0b10000000,
             0b11000000,
             0b11100000,
             0b11110000,
             0b11111000,
             0b11111100,
             0b11111110,
             0b11111111};
int corak2[4]={0b11110000,0b00001111,0b11000011,0b00111100};
```

Table 1

Array address	Index value
`pin[2]`	i.
`pin[8]`	ii.
`corak[1]`	iii.
`corak[7]`	iv.
`corak2[1]`	v.
`corak2[3]`	vi.

(1 mark)
(1 mark)
(1 mark)
(1 mark)
(1 mark)
(1 mark)

b) Based on array declaration given below, show your step to solve the following mathematical operation below (*Neglect the value change after the mathematical operation for each question*).

```
int nombor[]={5, 1, 103, 0, 0, 27, 9, 3, 7};
```

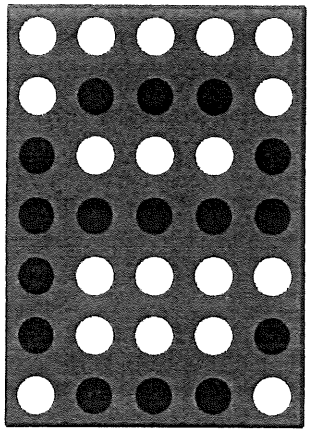
i. `nombor[3] = nombor[1] + nombor[5]` (2 marks)

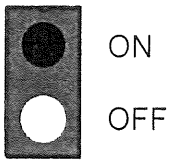
ii. `nombor[4] = nombor[5] / nombor[7]` (2 marks)

iii. `nombor[0] = nombor[4] - nombor[8]` (2 marks)

c) Produce an *array* declaration for the LED Matrix display given below.

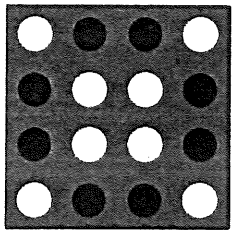
i.

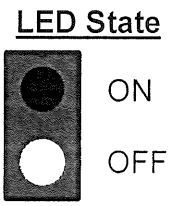




(8 marks)

ii.





(5 marks)

QUESTION 4

a) Write a suitable *function declaration* (Prototype) for the following statement:

i. LED on. (1 mark)

ii. LED blinking. (1 mark)

iii. Motor ON Clockwise. (1 mark)

iv. Set mode for input and output. (1 mark)

v. All Output OFF (1 mark)

b) Based on *'function'* program code below, show the return value for *'y'* at the end of the program when *'c'* value given as follows:

```
int kecerunan(int c, int x)
{
    int m = 3;
    int y = m*x + c;      //y=mx+c
    return y;
}
```

i. When, `kecerunan(2,3);` (3 marks)

ii. When, `kecerunan(11,4);` (3 marks)

c) Based on circuit given in Figure 4, produce a program to turn ON LED with two different pattern (given in Table 2) of LED light movement using ***'Function'*** method.

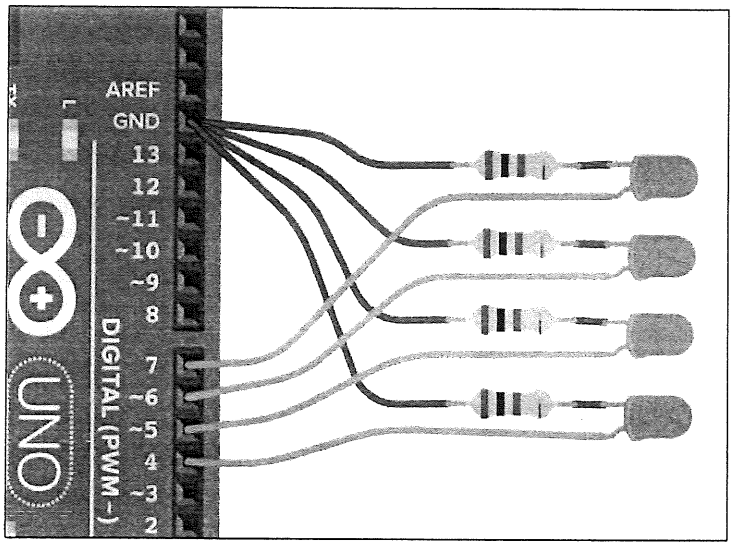


Figure 4

Table 2

Pattern 1	Pattern 2	LED Movement Direction
↓	↑	

(14 marks)

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

ATTACHMENT 1 : CODE FORMATING

Declaration

```
#define led1 12
int suis = 3;
int x,y;
```

Array Declaration

```
int kakiLED[]={4,5,6,7,8,9,10};
int ledMatrix[5][4]={
                    {0,1,1,0},
                    {1,0,0,1},
                    {1,0,0,1},
                    {1,0,0,1},
                    {0,1,1,0},
                    };
```

Prototype

```
void pattern_1();
void padam(int i);
```

Setup Function

```
void setup()
{
   pinMode(led1,OUTPUT);
   pinMode(suis,INPUT);
}
```

Main Program (Main Function)

```
void loop()
{
  pattern_1();
  padam(1000);
}
```

} Call function

Function / Sub-Program / Sub-Function

```
void pattern_1()
{

}
```

Selection

```
if(digitalRead(suis)==1)
{

}
else
{

}
```

```
-----------------------------
if(digitalRead(suis1)==1)
{

}
if(digitalRead(suis2)==1)
{

}
-----------------------------
if(digitalRead(suis1)==1)
{

}
else if(digitalRead(suis2)==1)
{

}
else
{

}
```

Looping

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

}
-----------------------------
do
{

}
while(digitalRead(suis)==1)
-----------------------------
for(int i=0; i<8; i++)
{

}
```

Array

```
for(int i=0; i<4; i++)
{
  digitalWrite(kakiLED[i],1);
```

ATTACHMENT 2 : CHEAT SHEET