



School of Computer Science Engineering

Winter Semester 2023-2024

Continuous Assessment Test – II

Program Name & Branch: BTECH CSE (BCB, BCE, BCI, BCT, BDS, BKT)

Course Name & code: BECE204L Microprocessors and Microcontrollers

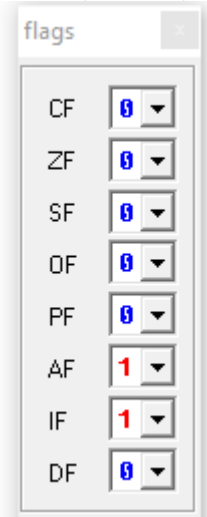
Slot: F1+TF1

Exam Duration: 90 Min.

Maximum Marks: 50

General instruction(s):

Answer all the questions

S. No	Question	Marks
1. A	Write the physical address of memory which is interfaced with 8086. The logical address is 1000:0200 H. Ans: Physical Address = (10H X 1000H) + 0200H = 10200H	2
B	Write the status of flag register of 8086 after executing the following program: MOV AX, 00FFH MOV BX, 00F2H ADD AX, BX Ans: CF = 0, ZF = 0, SF = 0, OF = 0, PF = 0, AF = 1, IF = 1, DF = 0.	3
		5
C	Identify the status of the Accumulator after executing each line of the following program: MOV AL,23H // AL =23H MOV BL,45H //AL = 23H 0010 0011 ADD AL,BL //AL = 68H 0110 1000 XOR AL,BL //AL =2DH 0110 1000 XOR 0100 0101 = 0010 1101 = 2DH SUB AL,3H // 2AH MOV BL,AL //2AH	

2	<p>Develop an 8086 ALP for $(A + B)^2$. Assume A and B values are 0 – 9 only.</p> <p>Ans: Assume (i) Data A is stored logical address at 3000H, Data B is stored at 3001H, (ii) A and B values are 5 and 6 respectively.</p> <pre> MOV [3000H], 05H MOV [3001H], 06H MOV AL,[3000H] ADD AL,[3001H] MUL AL HLT </pre>	10
3	<p>With the help of interrupt programming, develop an ALP of 8051 microcontrollers to perform the following tasks; continuously get numeric data from P0 and send it to P1. If the data is even, serially send it through port P2 with a baud rate of 19200. Otherwise, the data will be sent through P2 with a baud rate of 9600.</p> <p>Ans:</p> <pre> ORG 0000H LJMP MAIN ORG 0023H LJMP SERIAL ORG 0040H MAIN: MOV TMOD,#20H // Mode 2 of Timer 1 (Auto reload mode) MOV TH1,#-3 // Baud rate MOV SCON,#50H // Mode 1 in Serial communication MOV IE, #10010000B // Enable Serial Communication Interrupt SETB TR1 // start the timer XX: JB P2.0, L5 MOV PCON,#00H //For odd number , Baud rate = 9600, PCON = 00H SJMP L6 L5: MOV PCON,#80H //For even number , Baud rate = 19200, PCON = 80H SJMP L6 L6: MOV P1,P0 //copy data from Port 0 to Port1 continuously SJMP XX SERIAL: CLR TI MOV SBUF,P2 //copy data from Port 2 to UART continuously RETI END </pre>	10
4	<p>A football stadium is designed with a seating capacity of precisely 1000 persons. It is assumed that there is just one entry and exit gate accessible within the stadium. The entry gate is configured so that whenever a person enters a stadium, a high-to-low pulse will be generated and that will be given to the port3.4 of the 8051 microcontroller. The stepper motor regulates the opening and shutting of the entry gate. To open/close the entry gate, send a logic 1/logic 0 to</p>	10

port0.5 of the 8051 microcontroller, which connects to the stepper motor. Develop an ALP of 8051 that counts and allows maximum up to 1000 persons and closes the gate after that irrespective of persons leaving from the exit gate. Use the mode 2 timer programming.

Ans:

```

ORG 0000H
MOV TMOD, #06H // TIMER-0 AS A COUNTER
MOV TH0, #00
SETB P0.5 // Opening of the GATE
L2: SETB TR0
L1: JB TF0, L4
MOV A, TL0
MOV P1, A
CJNE R1, #03h, L1 // LOGIC FOR CHECKING THE 1000 PERSONS
L3: CJNE A, #0E8h, L1 // LOGIC FOR CHECKING THE 1000 PERSONS
CLR P0.5 // CLOSING OF THE GATE
SJMP Here

L4: CLR TR0
CLR TF0
INC R1
SJMP L2

Here: SJMP Here
END

```

5 Develop an ALP of 8051 for displaying reversely the nine characters string (Your Reg. No) on one line LCD display with Cursor blinking. The HEX value of command words are given below.

10

S. No	HEX Value	Command to LCD
1.	38H	8-bit 2-line 5x7 Dots LCD
2.	30H	8-bit 1-line 5x7 Dots LCD
3.	06H	Increment cursor
4.	04H	Decrement cursor
5.	80H	Beginning of First Row
6.	8FH	End of First Row
7.	0EH	Display on Cursor on
8.	0FH	Display on Cursor blinking
9.	01H	Clear cursor

Assume Port2 is used for Data/Command word transferring, Port1.0 is connected to RS of LCD, Port1.1 is connected to $\overline{R/W}$ of LCD and Port1.2 is connected to Enable of LCD.

Ans: Suppose Reg. No is 22BCE0123

```

ORG 0H

MOV A, #30H
ACALL CMDWRT
ACALL DELAY

MOV A, #0FH

```

**ACALL CMDWRT
ACALL DELAY**

**MOV A,#01H
ACALL CMDWRT
ACALL DELAY**

**MOV A,#04H
ACALL CMDWRT
ACALL DELAY**

**MOV A,#8FH
ACALL CMDWRT
ACALL DELAY**

**MOV A,#'2'
ACALL DATAWRT
ACALL DELAY**

**MOV A,#'2'
ACALL DATAWRT
ACALL DELAY**

**MOV A,#'B'
ACALL DATAWRT
ACALL DELAY**

**MOV A,#'C '
ACALL DATAWRT
ACALL DELAY**

**MOV A,#'E'
ACALL DATAWRT
ACALL DELAY**

**MOV A,#'0'
ACALL DATAWRT
ACALL DELAY**

**MOV A,#'1'
ACALL DATAWRT
ACALL DELAY**

**MOV A,#'2'
ACALL DATAWRT
ACALL DELAY**

**MOV A,#'3'
ACALL DATAWRT
ACALL DELAY**

AGAIN: SJMP AGAIN

**CMDWRT:MOV P2,A
CLR P1.0**

<pre>CLR P1.1 SETB P1.2 ACALL DELAY CLR P1.2 RET</pre>	
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```
DATAWRT:MOV P2,A
SETB P1.0
CLR P1.1
SETB P1.2
ACALL DELAY
CLR P1.2
RET
```

```
DELAY:MOV R3,#40
HERE2: MOV R4,#255
HERE:DJNZ R4,HERE
DJNZ R3,HERE2
RET
END
```

(b) For the given 8051 assembly program, find out the time required to execute it, if XTAL frequency is 11.0592 MHz.

MOV R4, #0FH	1 machine cycle
L1: ADD A, R4	1 machine cycle
MOV B, #89H	1 machine cycle
MUL A B	2 machine cycle
INC A	1 machine cycle
DJNZ R4, L1	2 machine cycle