INTERNATIONAL CENTRE FOR APPLIED SCIENCES
MAHE, MANIPAL
B.Sc. (Applied Sciences) in Engg.
End – Semester Theory Examinations – Nov./ Dec. 2020
III SEMESTER - MICROCONTROLLER (IEE 234)
(Branch: E&E)

Time: 3 Hours   **Date: 27 November 2020**   **Max. Marks: 50**

✓ **Answer ALL the questions.**
✓ **Missing data, if any, may be suitably assumed**

1A Discuss basic architecture of a microprocessor and a microcontroller with the help of a neat diagram and justify that a micro controller is an on chip computer.

(5 marks)

1B Explain the sequence of events that occur in 8051 microcontroller when the CALL and RET Instruction are executed.

(5 marks)

2A Write the result statement after execution of each instruction:

MOV 81H, #30H

MOV R0, # 0ACH

PUSH 00

PUSH 00

POP 01

POP 80H

MOV A, #0FFH

XRL A, 80H

POP 82H

POP 83H

MOVX @DPTR, A

(5 marks)

2B Calculate the execution time for the following instructions, if 8051 microcontroller is operated with 33MHz oscillator

SUBB A, #55H

MUL AB

(2 marks)

2C Identify the final values in A, B registers and status of Overflow flag after the execution of the following instructions

MOV A, #7BH

MOV 0F0H, #02H

MUL AB

MOV B, #0FEH

MUL AB

(3 marks)

3A   Write an ALP to add all ten bytes stored in internal RAM as shown in Table. Store the result in register R0.

Memory address	data
39H	11H
38H	02H
37H	05H
36H	23H
35H	20H
34H	07H
33H	01H
32H	08H
31H	09H
30H	03H

(5 marks)

3B   Write an ALP for 8051 to convert packed BCD 59H to two unpacked BCD numbers and place them in registers R3 and R5.

Note: All instructions must have appropriate comments.

(5 marks)

4A   Explain full duplex, half duplex and simplex data transfer. Write the steps required for programming 8051 to transfer data serially.

(5 marks)

4B   Write an ALP for 8051 to toggle all bits of port 0 continuously. Use Timer 0 to generate the delay of 2sec between each toggle. Assume Timer 0 is in mode 1.

Note: All instructions must have appropriate comments.

(5 marks)

5A   What are interrupts and interrupt subroutines? List and explain the interrupts that are present in 8051.

(5 marks)

5B   Write an ALP to generate two square waves with frequency 10 KHz and 50 KHz on port pins P1.1 and P1.2 respectively.

Note: All instructions must have appropriate comments.

(5 marks)

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