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Name of Examination : **Winter 2020** - (Preview)

Course Code & Course Name : **IN302U - Microcontroller and Applications**

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Maximum Marks : **60**

Duration : **3 Hrs**

[Edit](#) [Print](#) [View Answer Key](#) [Close](#) **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data; if required.
4. Figures to the right indicate full marks.

1)

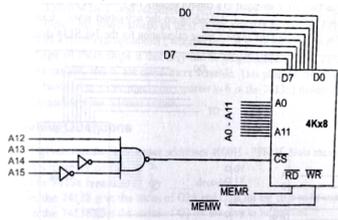
- a) Show the structure of PSW and state its address. Which bits of the PSW register are user-definable? [3]

Find the CY and AC flag bits for the following code.

```
MOV A,#0FFH
```

```
ADD A,#02
```

- b) Differentiate between microprocessor and microcontroller, with neat sketch. [3]
- c) Explain the steps to create an executable Assembly language program. Which different files are created during the execution of the program?. [4]
- d) Find the range of address of the 4K memory attached in the following figure. [2]



2) Attempt any two

- a) Explain following instructions with examples [6]
- i) PUSH ii) LCALL iii) LJMP iii) CJNE reg, #data
- b) Explain rotate and swap operations. Sketch the contains of an accumulator in 8-bit format after each of the following instructions. let CY=0. [6]

```
MOV A, #A4H
RLC A
SWAP A
RRC A
XRL A, #11H
```

- c) Explain the features of the PIC microcontroller with a neat sketch. [6]

3) Attempt any two

- a) Explain I/O hardware properties of different ports of the microcontroller. Also, describe the dual role of port 2 and port 3. [6]
- b) Explain single bitwise instructions with suitable examples. [6]
- Write a program to perform the following,
- (a) keep monitoring the switch connected to pin P1.3 until it becomes high.
- (b) when the switch is closed to make it high. write value 50H to port 0.
- (c) send a high-to-low (H-to-L) pulse to P 2.4
- c) Explain LCD working and steps for its interface to 8051. [6]
- Describe the function of pins E, R/W, and RS in the LCD.
- Give their status for sending a command code and date code to the LCD.

4) Attempt any two

- a) Describe the interrupt execution sequence in detail. Explanation of interrupts interrupt service routine, IE and programming steps is expected. [6]
- b) Describe the various modes of the 8051 timers. How to find the values to be loaded into the timer if we know the amount of timer delay? [6]
- c) Explain the basic operation of a keyboard and describe the key-press and detection mechanisms when connected to 8051. [6]

5)

- a) Design a μ Controller system using 8051, 8k bytes of ROM & 32k bytes of RAM. Interface the memory such that starting address for ROM is 6000H & RAM is 8000H. Explain details with a neat sketch. [7]
- b) What do you mean by Zigbee technology? How to Interface Zigbee Module with Microcontroller. [5]

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