B.E. Instrumentation Engineering (Model Curriculum) Semester - V

IN504M - Microcontroller & Interfacing

P. Pages : 2 **GUG/S/23/14024**

Time : Three Hours * 2 7 6 1 * Max. Marks : 80

Notes : 1. All questions carry marks as indicated.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.
4. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Explain the concept of memory organization in 8051 microcontroller. **8**

b) What are the different addressing modes supported by the 8051? Explain with examples. **8**

OR

2. a) Draw the timing diagram for MOVX instruction. **8**

b) Enlist and describe all the data transfer instructions in 8051 microcontroller. **8**

3. a) Write a short note to explain editor, linker, debugger, Locator, assembler, compiler, simulator. **8**

b) Write an assembly language program to multiply two 16 bit nos FFFFH X FFFFH. Assume suitable RAM locations for source data and destination for result. **8**

OR

4. a) Write 8051 instructions to store data FFH into RAM locations 50 H to 58 H using direct addressing mode. **8**

b) Write a program to add the values of locations 50 H and 51 H and store the result in locations 52 H and 53 H. Set PC as 0000H using assembler directive ORG and end the program with assembler directive EN. **8**

5. a) Write a program to generate a square wave of 1 KHz frequency using timer 0. Assume Microcontroller 8051 frequency as 12 MHz. **8**

b) Draw an 8 bit pattern of TCON and TMOD registers and explain each bit. **8**

OR

6. a) Enlist the interrupts associated with microcontroller 8051 with their vectored addresses and also explain IE and IP registers with their respective 8 bit pattern. **8**

b) Interface the 8255 PPI with 8051 microcontroller such that the control word register is selected for address 1003H. Find the address of port A, port B and port C. **8**

7.	a)	Enlist and explain the alternate functions of port 3.	**8**
	b)	Interface microcontroller 8051 with 4 digit seven segment multiplexed LED display and write a program to display 2018 continuously with a delay of 5 ms between each digit to display. Assume suitable address for storing permanent data in ROM as lookup table.	**8**

OR

8.	a)	Design an 8051 Microcontroller based system having externally connected EPROM of 8 KB and RAM of 8 KB. Show interfacing; address decoding table and chip select signal generation using decoder.	**8**
	b)	Interface 8051 microcontroller with Analog to Digital Converter (ADC) 0809. Write a program to read ten samples from channel no. 3 of ADC 0809 and store the received data into RAM locations starting from 30H.	**8**
9.	a)	Draw and explain the detailed architecture of Arduino and enlist some real time examples of Arduino.	**8**
	b)	Enlist the features of Arduino uno board.	**8**

OR

10.	a)	Draw the detailed interface of Arduino uno with IR sensor.	**8**
	b)	Write a short note on ‘Arduino : an IDE platform’.	**8**

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