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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E. **Semester: IV**
Branch: ES Cluster (EEE/ET/ECE/EIE/MD) **Duration: 3 hrs.**
Course Code: 19ES4CCMCS **Max Marks: 100**
Course: Microcontrollers **Date: 21.09.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1 a) Explain Port 1 functional diagram and give an example to read the port P1 in 8051 microcontroller. **08**

b) Discuss the role of Program counter and Data pointer in 8051with an example **06**

c) Discuss the use of four math flags in 8051 with an example **06**

UNIT - II

2 a) Explain with suitable instructions the addressing modes of 8051 CPU **08**

b) Write an ALP to swap the content of register r7 and r6 using exchange instructions **06**

c) Indicate whether the following instructions of 8051 are valid? If not, correct the instruction **06**

(i) ADD R0, A ii) MOVX DPTR, #9000h iii) MOV A, @R4
iv) POP R6 v) MOVC @A+DPTR, A vi) MOV R1,R0

OR

3 a) Explain the following instructions of 8051 with a suitable example in each case. **08**

RR A if A=65h (ii) DA A if A =4Fh after addition
XCHD A, @R1 if A=69h and content of memory addressed by R1 =25h
(iv) CJNE A, #05h, up

b) What are the final numbers in A,B and OV flag after the execution of the following instructions? **06**

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MOV A, #7B h
MOV 0F0h, #02 h
MUL AB
MOV B,#0FE h
MUL AB
```

c) Analyze the operation performed by the following instructions with examples **06**

i. MOV c,b ii JBC b, radd iii. JZ radd

UNIT - III

4 a) Explain the different ‘C’ data types for 8051 and also mention the range **08**

b) Write an 8051 C program to monitor bit P1.5. If it is high, send character 'A' to P0; otherwise, send AAh to P2. **06**

c) It is required to configure two timers in the following modes. Write appropriate control word in TMOD register. **06**

(i) Timer 0 as timer in mode 0, Timer 1 as timer in mode 2
(ii) Timer 0 as counter in mode 1, Timer 1 as a timer in mode 2
(iii)Timer 0 as timer in mode 1 and timer 1 as counter in mode 1

OR

5 a) Write the steps to program timer in mode 2 with an example **08**

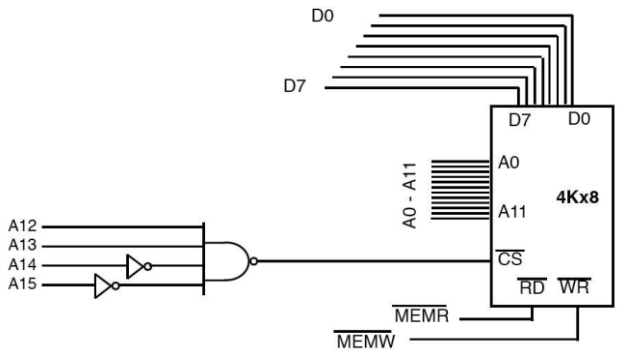
b) With XTAL=11.0592 MHz, find the TH1 value needed to have the following baud rate when SMOD =0 and SMOD=1. (a) 9600 (b) 2400 (c) 1200 **06**

c) Explain the register used for changing the priority level of interrupts. What is the control word to be written if the highest priority is given to timer 0 interrupt **06**

UNIT - IV

6 a) Write a c program (a) to store ASCII letters 'A' to 'E' an external RAM addresses starting at 0, (b) get the same data from the external RAM and send it to P1 one byte at a time. **08**

b) For the given decoding circuitry shown below, (a) calculate the address range. (b). What are the changes to be made if the address range is 5000h-5fffh. **06**



c) Four switches are connected to the upper 4-bit line (PB4-PB7). Write a program to transfer the status of these switches to LEDs connected to the lower 4-bits of port A (PA0-PA3). **06**

UNIT - V

7 a) Explain with a neat diagram, the block schematic of a stepper motor interfaced to 8051and write an ALP to rotate a motor 90° clockwise. Step angle of motor is 2°. **08**

b) Write a program to generate ramp waveform using DAC. Write appropriate comments **06**

c) Explain Signal Conditioning and write a flow chart to get data from the analog world **06**

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