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

Autonomous Institute Affiliated to VTU

September / October 2024 Supplementary Examinations

Programme: B.E **Semester: III**
Branch: Computer Science and Engineering **Duration: 3 hrs.**
Course Code: 19CS3ESMMC **Max Marks: 100**
Course: Microprocessors and Microcontrollers

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) With a neat diagram, explain the architecture of 8086 microprocessor. **8**

b) Analyze and identify if any errors in the following instructions: **6**
i) ADD AL,BL
ii) MOV BX,AL
iii) SHR AX,02
iv) MUL BL,CL
v) DIV AL,CL
vi) AND AL

c) Discuss the various addressing modes supported by 8086 microprocessor. **6**

UNIT - II

2 a) Write a delay routine to generate the delay of 100 ms for 8086 microprocessor that operates at 5 MHz frequency. **6**

b) Compute the contents of destination register after the execution of the following instruction. Also mention the effect on flags after execution of these instructions: **8**
i) ROL AX,CX if AX=0842h CX=0002h
ii) ROR AX,CX if AX=0842h CX=0002h
iii) SHR AX,CX if AX=0842h CX=0002h
iv) SAR AX,CX if AX=0842h CX=0002h

c) Write an 8086 assembly level language program to check whether given string is palindrome or not. **6**

UNIT - III

3 a) Discuss the functionality of the following pins of 8086 microprocessor operating in minimum mode: **10**
i) INTR **ii)** HOLD **iii)** $M/\overline{IO}$ **iv)** $\overline{TEST}$ **v)** LOCK

b) Analyze each bit of the control word given below designed for 8255 and specify the operation mode of PORT A, PORT B, PORT C UPPER and PORT C LOWER. Also explain BSR mode of the control word with an example. **10**

1	0	1	1	0	1	0	1

OR

4 a) Describe the internal architecture of 8255 with a neat diagram. **10**

b) Design a timing diagram for Memory Read cycle and Memory Write cycle. Explain the same. **10**

UNIT - IV

5 a) Based on the functionality provided by ports of 8051 Microcontroller, differentiate among Port 0, Port1, Port2 and Port3. **8**

b) On the basis of features supported, compare Microprocessor and Microcontroller. **6**

c) Design a code snippet for 8051 Microcontroller to swap the content of register R7 and R6 in register bank 0 using: **6**

- Register Addressing Mode
- Using Exchange instruction

UNIT - V

6 a) Write a program for 8051 Microcontroller to interface seven segment and display number "1234" with flashing effect. **8**

b) Compare and contrast the following instructions of 8051 Microcontroller with an example: **8**

i) RR and RRC

ii) RL and RLC

c) Explain the following Byte level logical instructions of 8051 Microcontroller: **4**

i) ANL A, Rr **ii)** XRL add, A

OR

7 a) Write a stepper motor program to rotate motor in an anti-clock wise direction. **8**

b) Demonstrate the working functionality of keyboard interfacing circuit with a diagram. **8**

c) Write a program that OR the contents of port 1 and port 2 and put the result in external RAM location 0100H. **4**

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