RAMAIAH
Institute of Technology

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(Autonomous Institute, Affiliated to VTU)
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SEMESTER END EXAMINATIONS – JUNE 2019

Course & Branch	: **B.E.: Information Science and Engineering**	**Semester**	: **IV**
Subject	: **Microprocessors**	**Max. Marks**	: **100**
Subject Code	: **IS45**	**Duration**	: **3 Hrs**

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT- I

1. a) Explain the internal architecture of 8086 with a neat block diagram. CO1 (08)
   b) Determine the physical address for the following instructions, if DS= 2000H, SS= 3000H, ES= 4000H, BP= 0010H, BX= 0020H, SP= 0030H, SI=0040H, DI=0050H. CO1 (08)
      i. MOV AL, [BP]
      ii. MOV CX, [BX]
      iii. MOV AL, [BP + SI]
      iv. MOV ES: [BX], AL
   c) Briefly explain the following 8086 directives: CO1 (04)
      i. DUP ii. ORG

2. a) Explain the following addressing modes of 8086: CO1 (08)
      i. Register addressing mode ii. Based Indexed addressing mode
      iii. Immediate addressing mode iv. Direct addressing mode.
   b) Explain flag register of 8086 with its format. CO1 (08)
   c) The OPCODE for MOV instructions is "100010". Determine machine language code for the following instructions: CO1 (04)
      i. MOV AL, [BX] ii. MOV 56[SI], CL

UNIT– II

3. a) Write an assembly language program using macros to generate Fibonacci series for N numbers and displaying the series. CO2 (10)
   b) Illustrate the technique behind passing parameters through memory and stack with appropriate examples. CO2 (10)

4. a) Write an algorithm for converting ASCII numbers to Binary and write an assembly language program to implement the same algorithm. CO2 (08)
   b) Write an assembly language program to count the number of zero's in a 16 bit binary number. CO2 (08)
   c) Why local variables are required in macro? How to define local variables in macro? CO2 (04)

UNIT- III

5. a) Design and develop an ALP for an 8086 based temperature monitoring system. The system should monitor temperature at 10 points with input port addresses ranging from AB00H onwards in sequence. The 10 output port addresses range CD05H onwards in sequence. An alarm is to be sent on the corresponding output port by transferring the number 01,if the temperature reading is above 80 units. CO3 (10)

	b)	Draw and explain in brief the signals of 8086 in the Maximum Mode Configuration.	CO3	(10)
6.	a)	Draw the Timing Diagram of the 8086 microprocessor Read Machine Cycle and explain the operation of the Address/Data, M/IO, ALE, DT/R, RD, DEN, and READY lines.	CO3	(10)
	b)	Write the necessary 8086 ALP statements to create a simple delay loop of 2ms, with a clock of 12 MHz.	CO3	(05)
	c)	Identify the need and use of the PUBLIC and EXTRN directives with examples.	CO3	(05)

UNIT- IV

7.	a)	List the interrupt response steps of the 8086 microprocessor.	CO4	(10)
	b)	Write the essential ALP statements to get data from input Port A. If the data is above 7FH, send a high value on PC_7; otherwise make PC_7 to be zero. Assume suitable port and CR addresses.	CO4	(10)
8.	a)	Illustrate with a diagram the organization of a 32Kx8 memory system with the respective bank enable signals and decoder.	CO4	(10)
	b)	Give the format of the 8255 Control Word and explain the role of each bit.	CO4	(05)
	c)	Illustrate with an example the need for the EVEN assembler directive and its use.	CO4	(05)

UNIT- V

9.	a)	Discuss with appropriate diagram for a simplified data path of a five-stage RISC pipeline.	CO5	(10)
	b)	Write a short note on Embedded System Hardware and Software related in working principle of a system	CO5	(10)
10.	a)	Discuss with neat diagram for ARM's register organization.	CO5	(08)
	b)	Discuss the ARM instruction pipeline with appropriate diagram.	CO5	(06)
	c)	Describe the condition flags of ARM processor.	CO5	(06)

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