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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Fourth Semester, B.E.- Computer Science and Engineering

Semester End Examination; June/July - 2015

Microprocessor

Time: 3 hrs *Max. Marks: 100*

***Note** : Answer **FIVE** full questions, selecting **ONE** full question from each **Unit**.*

UNIT - I

1 a. With a neat diagram, explain the internal architecture of the 8086 microprocessor. 10

b. Explain the conditional flags of 8086 microprocessor with an example. 6

c. Determine the memory address of the instruction to be executed by the microprocessor for the following CS: IP combinations; 4

i) CS = 1000H and IP = 2000H ii) CS = 3456H and IP = ABCDH

2 a. Discuss the following addressing modes with examples:

i) Direct ii) Immediate iii) Register 10

iv) Register relative v) Based Indexed

b. Determine the machine code for the following instructions: 4

i) MOV BP, SP ii) MOV DL, [DI] [OPCODE FOR MOV IS 100010]

c. Determine the execution time of the following instructions assuming the clock has a frequency of 5 MHz;

i) Add register to register 6

ii) Add memory to register using based indexed relative addressing (Both even and odd address)

UNIT – II

3 a. Explain the general format of an assembler instruction with an example. 6

b. Explain the following instructions with an example: 8

i) LEA ii) ADC iii) LOOP iv) ROL

c. Write a program using 8086 instructions to find the largest of two numbers. 6

4 a. Define Assembler directives. Explain the following directives with an example: 10

i) DB ii) STRUC iii) SEGMENT iv) EVEN

b. Write a program to search a key element in a list of n numbers, using binary search algorithm. 10

UNIT - III

5 a. What is modular programming? Mention its advantages. 5

b. What is stack? What is the use of stack memory? Explain the push & Pop instructions. 6

c. What is procedure? Mention the requirements which must be satisfied when calling a procedure. 5

Contd…2

	d.	Write a code needed to store and restore the contents of general purpose registers within the procedure.	4
6	a.	Write a recursive procedure to calculate the factorial of an integer n.	6
	b.	Explain the use of INTn instruction for debugging a program.	4
	c.	What is Nested macro? Explain with an example.	10

UNIT - IV

7	a.	Explain the following with an example: i) MOVS ii) CMPS iii) LODS iv) SCAS v) REP	10
	b.	Write a program to read a string and check whether it is palindrome or not.	10
8	a.	Explain IN and OUT instructions with an example.	4
	b.	Explain the sequence of events that occur when I/O is handled by the operating system.	6
	c.	With a neat diagram, explain programmed I/O transfer.	10

UNIT -V

9	a.	Briefly explain the functions of the following pins of 8086 microprocessor: i) ALE ii) $MN \mid \overline{MX}$ iii) INTR iv) NMI v) READY vi) CLK vii) RESET	7
	b.	With a neat diagram, explain 8284A clock generator.	7
	c.	Draw and explain the timing diagram for an interrupt acknowledgement.	6
10	a.	Explain with a neat diagram, the organization of 8259A programmable Interrupt controller.	10
	b.	Explain the initialization command words (ICWs) of 8259A.	8
	c.	Write a sequence of code for setting the contents of ICW's, which assumes that the even address of 8259A is 0080h.	2

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