IS435

RAMAIAH INSTITUTE OF TECHNOLOGY

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(Autonomous Institute, Affiliated to VTU)
Bangalore – 560 054

MAKEUP EXAMINATIONS – MAY/JUNE 2017

Course & Branch	**: B.E : Information Science and Engineering**	**Semester**	**: IV**
Subject	**: Microprocessors**	**Max. Marks**	**: 100**
Subject Code	**: IS435**	**Duration**	**: 3 Hrs**

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1.	a)	Briefly discuss with diagram of register model of 8086.	CO1	(06)

	b)	Find the status of the flags getting affected after the following instructions are executed, also Identify whether they are Conditional or Control flags
		i. Mov al, 24H
		ADD AL, 0BAH
		ii. Mov AL, 125
		ADD AL, 75
			CO1	(08)

	c)	Discuss with an appropriate example for any two directives used in assembly programming language.	CO1	(06)
2.	a)	Discuss the various addressing modes of 8086, give appropriate example for each.	CO1	(07)
	b)	Write an ALP using tiny model that does the following: i) Moves 1020H to AX, 056H to BL and C&6H to CX ii) Copies the content of AX to DS, the content of BH to AH and the content of CX to DX.	CO1	(06)
	c)	Discuss the instruction set design of 8086 along with general format for byte allocation. Design an op-code for the following instructions: Assume machine code for Mov is equal to 100010 i. Mov CX, DX ii. Mov AX, [2342h]	CO1	(07)

UNIT - II

3.	a)	Write an assembly language program using small model to count the number of 1's in a binary number.	CO2	(06)
	b)	Write an assembly language program to print the pattern using two macros. one macro to invoke STAR with different values of N and other macro NEW to move the cursor to the left side of the next line. ***** **** *** ** *	CO2	(08)
	c)	Illustrate with an example rotate through carry left and rotate through carry right.	CO2	(06)

4.	a)	Enter a string of characters through the keyboard and save it in memory. Check whether the entered string is a palindrome or not.	CO2	(08)
	b)	Write down the algorithm required for Converting ASCII numbers to Binary form and write an assembly language program using small model to show these algorithm.	CO2	(08)
	c)	What is meant by masking? With an example explain how it is used with Logical AND operation.	CO2	(04)

UNIT - III

5.	a)	What is the relationship between the EXTERN and PUBLIC directives?	CO3	(07)
	b)	Why are interfacing chips used between the processor and peripherals?	CO3	(07)
	c)	What is the duration of the bus cycle in an 8086 based microcomputer if the clock frequency is 12MHz and three wait states are inserted?	CO3	(06)
6.	a)	Test one data pin of an input port continuously. If it is low, send a character 'N' to an output port with address 78H, and continue monitoring the pin. When the input pin goes high, send the character 'Y' to the output port and stop monitoring the pin of the input port. The address of the input port is 90CDH.Write a program for this.	CO3	(06)
	b)	Draw a memory write machine cycle showing the state of all important signals.	CO3	(06)
	c)	With a Pin Configuration explain different pins of clock generator IC8284A.	CO3	(08)

UNIT – IV

7.	a)	How many address lines and data lines are needed for the memory chips with the following organization? ii) 256 X 4 ii) 32K X 8 iii) 128K X 8.	CO4	(06)
	b)	Discuss the five different Intel dedicated interrupt types directly related to CPU operations.	CO4	(08)
	c)	Write an ALP to display the character 'X' at the center of the screen.	CO4	(06)
8.	a)	Design an address decoder for two RAM chips, and two ROM chips each organized as 1K X 8 chips. Use gates for the decoding circuitry and specify the address range of each chip.	CO4	(10)
	b)	Write an ALP to rotate the stepper motor clockwise and anticlockwise by X degrees.	CO4	(10)

UNIT - V

9.	a)	Define pipeline. Explain three stage Pipeline execution mechanism in a RISC processor.	CO5	(10)
	b)	Discuss the ARM core Dataflow model.	CO5	(10)
10.	a)	Write an ARM Program to demonstrate the Factorial of a given number.	CO5	(10)
	b)	Draw and discuss of an ARM based embedded device, as a microcontroller.	CO5	(10)

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SEMESTER END EXAMINATIONS – MAY/JUNE 2017

Course & Branch	: B.E : Information Science and Engineering	Semester	: IV
Subject	: Microprocessors	Max. Marks	: 100
Subject Code	: IS435	Duration	: 3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1.	a)	With an example for each, explain different types of Addressing modes in 8086.	CO1	(10)
	b)	Find the machine code for the following instructions: i) ADD DS:0F246H[BP],DX ii) CMP 34H[DI][BX],DL.	CO1	(10)
2.	a)	Using the tiny model ,write a program that does the following: i) moves 1222H to AX,0564H to BL and 0C764H to CX. ii) Copies content of AX to DS, the content of BH to AH and the content of CX to DX.	CO1	(08)
	b)	With a block diagram explain Register model of 8086.	CO1	(06)
	c)	List the differences between: i) instructions and Directives ii) COM and EXE files.	CO1	(06)

UNIT - II

3.	a)	Discuss with an appropriate example for Jump, Loop and Compare instructions of 8086.	CO2	(09)
	b)	Write an Assembly Language Program to scan a byte or word string in order to ascertain the presence of a specific byte or word.	CO2	(06)
	c)	Differentiate Procedure and Macro.	CO2	(05)
4.	a)	Discuss with an appropriate example for shift and rotate instructions of 8086.	CO2	(06)
	b)	Write an Assembly Language Program that counts the number of 1's in a binary number.	CO2	(06)
	c)	Discuss with an appropriate example for passing a parameters through memory and through the stack.	CO2	(08)

UNIT- III

5.	a)	List out the differences between 8086 and 8088.	CO3	(04)
	b)	Write a program for getting a delay of 5 msec.	CO3	(05)
	c)	Why is modular programming important? Discuss in brief.	CO3	(05)
	d)	Which are the control signals not available in the 8086 maximum mode? Explain any two.	CO3	(06)

6.	a)	How the mode of operation of the processor selected and what is the purpose of each mode?	CO3	(04)
	b)	Write a program for getting a delay of 100 msecs.	CO3	(05)
	c)	What is meant by fixed port addressing? Explain with an example.	CO3	(05)
	d)	In an 8086 temperature monitoring system, four points are connected as an input port with address 56H .If the data in these lines goes above the number 1000 (binary), an alarm has to be sent. This is done by sending the character 'A' to an output port with address 9FC3H. Write a program for this.	CO3	(06)

UNIT - IV

7.	a)	How many address lines does a 256K memory chip need?	CO4	(02)
	b)	List a few BIOS functions used for display activation.	CO4	(04)
	c)	With a neat diagram, discuss architecture of Programmable peripheral Interface.	CO4	(08)
	d)	Give the classifications of interrupts in 8086? Explain the 8086 interrupt response mechanism.	CO4	(06)
8.	a)	What happens if a number of interrupts occur at the same time?	CO4	(04)
	b)	Design the control word of the 8255 with: i) All ports as input ports ii) Port A and B as input and port C as output.	CO4	(06)
	c)	Write a keyboard procedure that scans the keyboard and returns with numeric code of the key in AL.	CO4	(10)

UNIT - V

9.	a)	With a neat diagram explain ARM Core dataflow model.	CO5	(06)
	b)	Explain different Addressing mode for load-store multiple instructions in ARM Instruction set.	CO5	(06)
	c)	Write a ARM program to display character from 0-9.	CO5	(08)
10.	a)	Describe the following: i) Advanced Microcontroller Bus Architecture(AMBA). ii) Boot Code(Initialization code)	CO5	(10)
	b)	Write a ARM program to search for a key in an array using any search technique.	CO5	(10)

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(Autonomous Institute, Affiliated to VTU)
(Approved by AICTE, New Delhi & Govt. of Karnataka)
Accredited by NBA & NAAC with 'A' Grade

SEMESTER END EXAMINATIONS – MAY/JUNE 2018

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 architecture of 8086 microprocessor with a neat block diagram. CO1 (10)

   b) Using the full segment definition, write a program to add the content of two words which are in memory, and store the sum in the memory. CO1 (05)

   c) Identify the addressing mode of the following instructions. CO1 (05)

      i) MOV [4560H], AX
      ii) ADD BL, 89H
      iii) ADD BX, [DI]
      iv) MOV 6[BP][DI], AL
      v) MOV CX, [BP + 9]
      vi) ADD CL, BL

2. a) Design the machine code for the following instructions: CO1 (10)

   XOR AL,BL
   AND AX,BX,
   OR AL,BL
   MOV DS,AX
   MOV AL,[3456]
   (Note : Assume Op-code is 6 bit where XOR,AND,OR and MOV are 111001, 111010, 111011 and 111101, respectively.)

   b) Write an assembly level language program to sort the numbers in descending order using selection-sorting technique. The program should be written using assembler directives. CO1 (10)

UNIT- II

3. a) Write an assembly language program to count number of Zero's in a given word data and display it on the screen. CO2 (10)

   b) Explain the following string instructions with an example. CO2 (10)
   i)CMPSB ii)SCASB iii)LODS2B iv)XLAT.

4. a) Write an assembly language program to print the pattern shown below using two macros. one macro to invoke STAR with different values of N and other macro NEW to move the cursor to the left side of the next line. CO2 (10)

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   ****
   **
   ****
   ******

				CO2	(10)
	b)	i) Distinguish between a near and a far call with an example. ii)Discuss the working of STODS and LODS string instruction with an example.		CO3	(08)
		UNIT- III			
5.	a)	Write an assembly instructions within C shell for the program to perform addition of two 8-bit numbers through the keyboard and display the sum.		CO3	(06)
	b)	Write an assembly language program for getting a delay of 100 msecs.		CO3	(06)
	c)	What is the relationship between EXTRN and PUBLIC directive? Explain with an example.		CO3	(10)
6.	a)	Explain two different forms of I/O instructions available in 8086 microprocessor with an example.		CO3	(10)
	b)	In a pressure monitoring environment, 10 pressure sensors have been connected. The pressure from these sensors has to be read at intervals of 5 msecs. Write a program to read the sensor values from input ports having address 0FF0H to 0FF9H.			
		UNIT- IV			
7.	a)	Find the address (in the IVT) of the interrupt vector of INT 61h. Find the physical address of the ISR corresponding to this interrupt if the vector is 0F00:9872.		CO4	(10)
	b)	Explain the terms "interrupt service routine and interrupt vector'		CO4	(06)
	c)	List a few BIOS functions used for display activation.		CO4	(04)
8.	a)	Configure Port A in Mode 2, Port B as o/p in mode 0. (PC5-0 are handshake lines for Port A and PC2-0 are handshake signals for port B) and write the suitable initialization routines.		CO4	(08)
	b)	Explain the sequence of actions that occur in an interrupt acknowledge cycle.		CO4	(08)
	c)	Discuss the bit/reset mode of 8255.		CO4	(04)
		UNIT- V			
9.	a)	Discuss the direct and immediate addressing instruction formats of ARM Processor.		CO5	(10)
	b)	Write an ARM Program to demonstrate the Factorial of a given number.		CO5	(10)
10.	a)	List the features have made the ARM processor one of the most commonly used 32-bit embedded processor cores, and why many of the top semiconductor companies around the world produce products based around the ARM processor discuss briefly.		CO5	(10)
	b)	Write an ARM program module to demonstrate the search for a key using Linear search.		CO5	(10)

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No mobile phones

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Course & Branch : B.E. – Information Science & Engg. **Semester : IV**
Subject : Microprocessors **Max. Marks : 100**
Subject Code : IS435 **Duration : 3 Hrs**

Instructions to the Candidates:
- Answer one full question from each unit.

UNIT – I

1.	a)	What are the general concerns and advantages of Memory Segmentation? Illustrate how is 20 – bit physical address generated in 8086 system.	CO1	(10)
	b)	How do you set/reset conditional flags?	CO1	(05)
	c)	Find the Machine code for: i. MOV [BX][SI], AL ii. MOV ax,1234H	CO1	(05)
2	a)	List the general concerns and advantages of Segmentation. How is memory organized in 8086 processor?	CO1	(10)
	b)	With an example for each, explain any five addressing modes of 8086.	CO1	(05)
	c)	Write an assembly code to disassemble a byte stored in memory.(Hint: if 2AH is in memory, disassemble it as 02 and 0A and store elsewhere).	CO1	(05)

UNIT – II

3.	a)	Discuss the pre-requisites for using string instructions and list any five string instructions along with flags affected during the execution.	CO2	(10)
	b)	Explain the action of the following instructions with an example. i. AAM ii. AAS iii. AAD iv. AAM v. DAA	CO2	(10)
4.	a)	Write a program which contains the following macros: i. for calculating the Fibonacci series for N, ii. for entering the value of N, iii. for displaying the numbers..	CO2	(09)
	b)	How are local variables in a macro taken care of?	CO2	(06)
	c)	What is meant by the term 'parameter passing' in the context of procedures?	CO2	(05)

UNIT – III

5.	a)	With an example demonstrate shift and rotate instructions.	CO3	(05)
	b)	Which are the control signals not available from the 8086 in the maximum mode?	CO3	(05)
	c)	Why is modular programming important?	CO3	(05)

	d)	Write a program for getting a delay of 100 msecs. MOV CX,N HERE :ADD AX,0 LOOP HERE	CO3	(05)
6.	a)	Differentiate between memory mapped I/0 and isolated I/O?	CO3	(05)
	b)	List out the differences between 8086 and 8088.	CO3	(05)
	c)	Test one data pin of an input port continuously. If it is low, send a character 'N' to an output port with address 78H.,and continue monitoring the pin. When the input pin goes high , send the character 'Y' to the output port and stop monitoring the pin of the input port .The address of the input port is 90CDH.	CO3	(10)

UNIT – IV

7.	a)	Draw a decoding circuit using partial decoding for a RAM and EPROM, each of size 8K X 8. For decoding, use only the address lines A_{13} and A_{14}. What is the size of its fold back memory?	CO4	(10)
	b)	Discuss with an appropriate diagram for the I/O address decoding with its input and output ports.	CO4	(10)
8.	a)	Discuss in detail all five dedicated interrupt types.	CO4	(10)
	b)	Write an ALP to implement a simple calculator for add/subtract operations using Keypad interface.	CO4	(10)

UNIT-V

9.	a)	Discuss with appropriate diagram for a simplified data path of a five-stage RISC pipeline.	CO5	(10)
	b)	Discuss with neat diagram for ARM's register organization.	CO5	(10)
10	a)	Write a short note on Embedded System Hardware and Software related in working principle of a system.	CO5	(10)
	b)	Discuss the ARM instruction pipeline with appropriate diagram.	CO5	(06)
	c)	Write an ARM program to add two numbers.	CO5	(04)

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