SAVEETHA ENGINEERING COLLEGE
AUTONOMOUS
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Question Repository for APRIL-2025 Examinations

Subject Code	**19EC408/ EC1408**	**Subject Name**	**MICROPROCESSOR AND MICROCONTROLLER**	**Common To**	**CSE, ECE, IT, BME, MED**
Faculty Name	**Ms.K.SAKTHI Mr.M.PRAVEEN**	**Department**	**ECE**	**SCRUTINIZED BY**	**Dr.S.KUMARAN/ECE**

(PART A – 2 Marks)

UNIT – I

Q. No	Questions	CO	Knowledge Level (Blooms)	Difficulty Level (1-5)
QA101*	List the different general purpose registers available in an 8086 microprocessor.	CO1	K1	1
QA102	Describe the functions of ALE and DEN Pins in 8086 Microprocessor.	CO1	K2	1
QA103*	Identify the information when QS1 and QS0 of 8086 queue are 01.	CO1	K2	2
QA104	Draw the bus request and bus grant timings in minimum mode system of 8086.	CO1	K2	1
QA105	Classify the different types of interrupts supported by 8086.	CO1	K2	2
QA106*	Define the following assembler directives: ASSUME & ORG.	CO1	K2	2
QA107*	Identify the addressing modes of the following instructions in 8086: ● MOV AL, BL ● MOV AX, 1234H	CO1	K2	2
QA108	Give some of the flag manipulation instructions of 8086.	CO1	K1	2

UNIT – II

Q. No	Questions	CO	Knowledge Level (Blooms)	Difficulty Level (1-5)
QA201	Differentiate microprocessor and microcontroller.	CO2	K1	1
QA202	Recall the features of 8051 microcontroller.	CO2	K1	1
QA203	Identify the use of PCON register in 8051 microcontroller.	CO2	K2	2
QA204*	Interpret the significance of the DPTR register in microcontroller.	CO2	K2	1
QA205	Recite the points to be remembered in accessing external memory of the 8051microcontroller.	CO2	K1	2
QA206*	Identify the purpose of the PSW register in microcontroller.	CO2	K1	2
QA207	State the purpose of RS1 and RS0 bits in the flag register of Intel 8051 microcontroller.	CO2	K1	2
QA208	Mention the function of a program counter.	CO2	K1	2

UNIT – III

Q. No	Questions	CO	Knowledge Level (Blooms)	Difficulty Level (1-5)
QA301*	List out the addressing modes in 8051 Microcontroller.	CO3	K1	2
QA302	Recall why program instructions are stored in ROM and data are stored in RAM in a microcontroller.	CO3	K1	2

QA303	Show the status of the CY, AC and P flags of 8051 microcontroller after the addition of 9CH and 64H in the following instructions:
	MOV A, #9CH
	ADD A, #64H
		CO3	K2	1

QA304	Interpret the operation carried out when 8051 microcontroller executes the instruction,MOVX A,@A+DPTR.	CO3	K2	1

QA305	Write a program to find the 2's complement of a number using 8051 microcontroller.	CO3	K1	2
QA306	Write about LCALL statement of 8051 microcontroller.	CO3	K1	2
QA307	Contrast LJMP and SJMP instruction of 8051 microcontroller.	CO3	K3	2
QA308*	Write a program using 8051 assembly language to change the data 55H stored in the lower byte of the data pointer register to AAH using rotate instruction.	CO3	K1	1

UNIT - IV

Q. No	Questions	CO	Knowledge Level (Blooms)	Difficulty Level (1-5)
QA401*	Draw the format of IE register of 8051.	CO4	K2	1
QA402*	Compare 4-bit and 8-bit modes in LCD interfacing.	CO4	K2	2
QA403	Name the five interrupt sources of 8051.	CO4	K1	3
QA404	State the purpose of the Register Select (RS) pin in an LCD module.	CO4	K2	2
QA405	Give the priority level of the interrupt sources in 8051 microcontroller.	CO4	K2	2
QA406	Identify the use of a watchdog timer.	CO4	K2	2
QA407*	What register keeps track of interrupt priority in the 8051? Explain.	CO4	K2	2
QA408	How to control the speed of a stepper motor?	CO4	K2	2

UNIT – V

Q. No	Questions	CO	Knowledge Level (Blooms)	Difficulty Level (1-5)
QA501*	Differentiate CISC and RISC architectures.	CO5	K1	1
QA502	State the applications of ARM processor.	CO5	K1	2
QA503	List the two key features of LPC 2148 microcontroller.	CO5	K1	1
QA504*	Compare and contrast AVR series with ARM microcontrollers.	CO5	K2	2
QA505	Define Brown Out delay.	CO5	K1	2
QA506	What is the significance of ARM Processor?	CO5	K1	1
QA507	Give the CPSR format for ARM processor.	CO5	K2	2
QA508	What are RISC-V microcontrollers? How it is different from other instruction set architectures?	CO5	K2	2

(PART B – 13 Marks - Either Or Type)

UNIT – I

Q. No	Questions	CO	Knowledge Level (Blooms)	Difficulty Level (1-5)
QB101 (a)	Explain the internal architecture of 8086 and explain the functions of each block in detail.	CO1	K2	2
	(Or)			
QB101 (b)	Explain in detail about the interrupts and interrupt service routine of 8086.Explain interrupt sequence for 8086.	CO1	K2	3
QB102 (a)	Draw and explain the pins and signals of 8086 microprocessor.	CO1	K2	3

	(Or)			
QB102 (b)	Explain the following assembler directives of 8086 microprocessor: i)EQU ii) EXTRN iii) SEGMENT iv) PUBLIC v) TYPE	CO1	K3	3
QB103 (a)	Examine the various addressing modes available in 8086 and explain each mode with an example.	CO1	K3	3
	(Or)			
QB103 (b)*	Describe the instructions which are used to perform data transfer operations in 8086 microprocessor.	CO1	K3	3
QB104(a)	Describe the instructions which are used to perform arithmetic operations in 8086 microprocessor.	CO1	K3	2
	(Or)			

QB104(b)*	(i)The value of Code Segment (CS) Register is 4042H and the value of different offsets is as follows:
	BX: 2025H , IP: 0580H , DI: 4247H
	Devise the effective address of the memory location pointed by the CS register. (7 marks)
	(ii) The value of the DS register is 3032H. And the BX register contains a 16 bit value which is equal to 3032H. Now, after executing the below instructions,
	ADD BX, 0008H
	MOV [BX], AX
	Devise the physical address at which the value of the AX will be stored. (6 marks)
		CO1	K4	3

UNIT – II

Q. No	Questions	CO	Knowledge Level (Blooms)	Difficulty Level (1-5)
QB201 (a)	Draw and explain the pin diagram of 8051 microcontroller.	CO2	K2	2
	(Or)			
QB201 (b)*	List the special function registers in 8051 microcontrollers and also explain each register with its format and functions.	CO2	K2	3
QB202 (a)	Explain how an external program memory can be interfaced with 8051 microcontroller.	CO2	K2	3

	(Or)			
QB202 (b)*	Explain the key differences between microprocessor and microcontroller and justify why microcontrollers are preferred in embedded systems.	CO2	K2	3
QB203 (a)	(i) Draw the PSW of 8051 microcontroller and describe the use of each bit in PSW. (5 marks) (ii) Describe the functions of the following signals in 8051 microcontroller: RST, EA, PSEN and ALE (8 marks)	CO2	K3	3
	(Or)			
QB203 (b)	Discuss the memory organization of 8051 microcontroller.	CO2	K3	3
QB204(a)	Elaborate the signals of 8051 microcontroller.	CO2	K2	2
	(Or)			
QB204(b)	Explain the port operations of 8051 microcontroller in detail.	CO2	K2	3

UNIT – III

Q. No	Questions	CO	Knowledge Level (Blooms)	Difficulty Level (1-5)
QB301 (a)	Explain the different ways of addressing data in 8051 with one example each.	CO3	K2	2
	(Or)			
QB301 (b)	Describe the various instructions found in 8051 to move data from one memory to another memory location. Explain each instruction with examples.	CO3	K2	2
QB302 (a) *	Explore the program in 8051microcontroller to arrange the data in the ascending order.	CO3	K4	3
	(Or)			
QB302 (b)*	Write a program to move a block of data which is stored in internal location to another internal memory location.	CO3	K4	3
QB303 (a)	Discuss the logical instructions of the 8051microcontroller with examples.	CO3	K2	2

	(Or)			
QB303 (b)*	Write an assembly language program in 8051 microcontroller to find the largest among N numbers.	CO3	K2	2
QB304(a)	Describe the branching instructions of 8051 microcontroller with examples.	CO3	K2	2
	(Or)			
QB304(b)	List and explain the arithmetic instructions of the 8051 microcontroller.	CO3	K2	2

UNIT - IV

Q. No	Questions	CO	Knowledge Level (Blooms)	Difficulty Level (1-5)
QB401 (a)*	Explain the interrupt structure of 8051 microcontroller. Explain how interrupts are serviced in 8051.	CO4	K2	3
	(Or)			
QB401 (b)*	Discuss the interfacing of DAC with 8051 microcontroller using suitable diagram and Write a program to generate a sine wave using DAC 0808.	CO4	K2	3
QB402 (a)	Explain the role of a command register and data register in an LCD interface.	CO4	K3	5
	(Or)			
QB402 (b)	Explain in detail about the special registers formats of interrupt operation for 8051 microcontroller.	CO4	K3	5
QB403 (a)	Assuming XTAL= 11.0592 MHz, write an 8051 ALP to generate a square wave of 50 Hz frequency on pin P2.3.	CO4	K3	3
	(Or)			
QB403 (b)	Draw and explain the interfacing of ADC for the conversion of analog to digital data using 8051 microcontroller.	CO4	K3	4
QB404 (a)*	Write an ALP to display message "HELLO" as LCD display by interfacing with 8051.	CO4	K4	3
	(Or)			
QB404 (b)	Draw and explain the interfacing circuit of LCD with 8051.	CO4	K4	3

UNIT – V

Q. No	Questions	CO	Knowledge Level (Blooms)	Difficulty Level (1-5)
QB501 (a)*	Compare RISC and CISC design architectures with suitable block diagrams. Explain the important design rules of RISC philosophy.	CO5	K3	3
	(Or)			
QB501 (b)	Discuss in detail ARM7 microcontroller (LPC2148) architecture and organization.	CO5	K3	3
QB502 (a)*	Explain the main features,advantages and real time applications of AVR Series microcontrollers.	CO5	K2	3
	(Or)			
QB502 (b)	Describe the different features of ARM instruction set that make it suitable for embedded applications.	CO5	K2	3
QB503 (a)	With a neat diagram, explain the different general purpose registers of ARM processors.	CO5	K3	3
	(Or)			
QB503 (b)	Explain the following Thumb instructions with an example: i) Stack ii) Software interrupt iii) Single register load-store iv) Multiple register load-store	CO5	K3	4
QB504(a)	Describe the pipeline executing characteristics for an ARM7 processor with necessary diagrams and examples.	CO5	K3	3
	(Or)			
QB504 (b)	Explain current program status register of ARM processor with neat diagram.Also describe the various processor modes.	CO5	K3	4

(PART C – 15 Marks - Either Or Type)

UNIT – I

Q. No	Questions	CO	Knowledge Level (Blooms)	Difficulty Level (1-5)
QC101(a)*	(i) Write an 8086 assembly language program to reverse a given string stored in memory. The program should use registers and looping techniques to swap characters in place. Explain the logic and working of the program. (8 Marks) (ii) Write an assemble language program to arrange the given array in ascending order, the length of array is ten 16-bit numbers (7 Marks)	CO1	K4	3
	(Or)			
QC101(b)	(i) Frame a program based on 8086 instruction set to Multiply a two numbers and store the result in memory. (8 Marks) (ii) Implement a program based on 8086 instruction set to compute the sum of 'n' number of bytes stored in the memory. (7 Marks)	CO1	K4	2

UNIT – II

Q. No	Questions	CO	Knowledge Level (Blooms)	Difficulty Level (1-5)
QC201(a)	With a neat diagram, Describe the architecture of 8051 microcontroller.	CO2	K2	3
	(Or)			
QC201(b)*	Explain how the external data memory can be interfaced with 8051 microcontroller.	CO2	K2	2

UNIT – III

Q. No	Questions	CO	Knowledge Level (Blooms)	Difficulty Level (1-5)

QC301(a)*	Write a program in 8051 to count the Number of zeros in a given input data.	CO3	K4	4
	(Or)			
QC301 (b)	Depict the addressing mode for the following instructions of 8051 and state how each instruction is different with respect to the changes in PSW. (i)MOV A, R3 (ii) MOV A,@R_0 (iii)MOV A, #40H (iv)MOV A, 30H	CO3	K4	4

UNIT – IV

Q. No	Questions	CO	Knowledge Level (Blooms)	Difficulty Level (1-5)
QC401 (a)	Draw the diagram for interfacing a stepper motor with 8051 microcontroller and (i)Write 8051 ALP for changing the speed (7) (ii)Develop a program to rotate the motor in both clockwise and anti clock wise directions.(8)	CO4	K5	3
	(Or)			
QC401 (b)*	Interface DAC to port 2 of 8051 and explain how to generate a signal and also write an assembly language program for generating square and saw-tooth waveforms.	CO4	K5	3

UNIT – V

Q. No	Questions	CO	Knowledge Level (Blooms)	Difficulty Level (1-5)
QC501 (a)*	Explain the concept of banked registers in ARM processor. Show how the banked registers are utilized when the user mode changes to IRQ mode.	CO5	K4	4
	(Or)			
QC501 (b)	Critically evaluate the advantages and limitations of using RISC-V based open source microcontroller in commercial applications compared to proprietary architectures.	CO5	K4	4