Department of Electronics and Communication Engineering
Question Bank - Academic Year (2021-22)

Course Code & Course Name : **19ECC07/ Microcontroller Based System Design**

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Year/Sem : **II/IV**

Unit-I : 8051 Microcontroller

Part-A (2 Marks)

1. What are the different addressing modes of 8051?

2. State the purpose and importance of NOP operation.

3. Mention the function of rotate instruction. Give an example.

4. What is the purpose of timing diagram in 8051 controller?

5. Give the function of CMP instructions.

6. List the interrupt of 8051 controller.

7. Mention the purpose of SID and SOD lines.

8. Define stack and stack related instructions.

9. List the features of 8051 controller.

10. Clarify the term pipelining.

Part-B (16 Marks)

1.(i). Draw the pin diagram of 8051 and explain the functions of various signals. (8)

 (ii). With the help of neat diagram, explain the memory organization of 8051 controller. (8)

2.(i). Briefly explain about the arithmetic and logical instructions of 8051 microcontroller. (8)

 (ii). With neat architecture, explain about the 8051 microcontroller. (8)

3.(i). Expound the I/O pins ports and circuit details of 8051 with its diagram. (8)

 (ii). Elucidate the register banks and special function register of 8051. (8)

4.(i). Decipher the vectored interrupts of 8051 microcontroller. (8)

 (ii). Illustrate the interrupt structure of 8051 in detail. (8)

5.(i). Draw the data memory organization of 8051 microcontroller and explain. (8)

 (ii). Explain the different operating modes of timer in 8051 controller. (8)

Unit – II 8051 Microcontroller Interfacing

Part-A (2 Marks)

1. What is the purpose of Watchdog Timer/Counter?

2. Mention the difference between the timers and counter.

3. What is the necessity of prescalar in the timer operation?

4. How the timer 0 interrupt is enabled?

5. What are all the types of interrupts in 8051?

6. Mention how to select register banks in the 8051.

7. What is the purpose of pull up resistors?

8. Differentiate ADC and DAC.

9. Why 8051 is called a 8 bit microcontroller?

10. List out the difference between bit addressing and byte addressing.

Part-B (16 Marks)

1.(i). Explain interrupts and timers in 8051 microcontroller. (16)   (8)

 (ii). Draw and explain the function of bits in TMOD registers in 8051   (8)

2.(i). Draw and explain the function of bits in TCON registers in 8051   (8)

 (ii). Explain the different modes of operation of serial port in 8051, indicating various   (8)
        registers associated with it.

3.(i). Explain the on-chip D/A, A/D Converters, real time clock and watchdog timer facilities   (8)
        in 8051.

 (ii). Explain about External Memory interface in detail.   (8)

4.(i). Describe the different modes of operation of timers/counters in 8051 with its associated   (8)
        registers.

 (ii). Draw and explain interfacing of 4x4 matrix keyboard with 8051 microcontroller.   (8)

5.(i). Write an assembly language program to rotate stepper motor continuously, assume step   (8)
        angle of 1.8 degree.

 (ii). Explain the interfacing of DAC 0800 with 8051. Write an ALP to generate a square   (8)
        wave through it.

Unit-III : PIC Microcontroller

Part-A (2 Marks)

1. What are the Core features of PIC16C7X microcontroller?

2. What are the Peripheral features of PIC16C7X microcontroller?

3. Draw the PIN diagram of PIC16C7X microcontroller.

4. Draw the General format of Byte Oriented instruction.

5. Draw the General format of Bit Oriented instruction.

6. Draw the General format of Literal and Control Oriented instruction.

7. Mention any two instructions which take 1 or 2 machine cycles to execute.

8. What is the Bit size of the working register in PIC16C7X microcontroller?

9. Differentiate Harvard Architecture with Von Neumann Architecture.

10. Classify broadly the special function registers.

Part-B (16 Marks)

1.(i). With neat block diagram explain the architecture of PIC16C7X microcontroller. (8)

(ii). Explain Clocking Scheme/Instruction Cycle and Instruction Flow/Pipe Lining of PIC16X7X microcontroller. (8)

2.(i). Explain the Memory Organization of PIC16C7X microcontroller. (8)

(ii). Explain with neat examples Byte Oriented, Bit Oriented and Literal and Control Instructions of PIC16C7X microcontroller (8)

3.(i). What are the different addressing modes of PIC microcontroller and explain them? (8)

(ii). Write a simple PIC16C7CX program to add, subtract, multiply and divide two 16 bit numbers. (8)

4.(i). Discuss how instruction pipelining is implemented in PIC. (8)

(ii). Explain all the conditional instructions of PIC microcontroller. (8)

5.(i). Write down various CPU registers of PIC microcontroller and explain them. (8)

(ii). Explain the following terms: (i) Brown on Reset (BoR) (ii) Watch Dog Timer (WDT) (8)

Unit-IV : ARM 32 bit Microcontroller

Part-A (2 Marks)

1. Point out the list of ARMs visible registers.

2. Summarize how ARM handles the exceptions

3. Identify the need of thumb instruction set?

4. Mention any two of the thumb instruction set

5. Write down the ARM CPSR format

6. State any two data transfer and control flow instructions

7. What facts would you select to list the features of the ARM instruction

8. Formulate necessary code using ARM assembly language program for creating a delay.

9. Illustrate Branch with Link and exchange instruction in ARM Processor

10. Which features does ARM have in common with many other RISC architectures?

Part-B (16 Marks)

1.(i).	Define the architectural inheritance of ARM processor and explain?	(8)
(ii).	Explain the ARM Development tools in detail	(8)
2.(i).	Name the principle features of ARM architecture	(8)
(ii).	List the different ARM Development Tools and describe about them.	(8)
3.(i).	Illustrate the ARM Programmers Model with necessary diagrams.	(8)
(ii).	Explain the bus architecture of an ARM Processor?	(8)
4.(i).	Discuss in detail the different modes of operation of ARM processor?	(8)
(ii).	Define Addressing mode? List the addressing modes of ARM.	(8)
5.	Discuss in detail the architectural support for operating systems.	(16)

Unit-V : ARM Cortex M3 Programming

Part-A (2 Marks)

1. What is 3 & 5 stage pipeline?

2. List out some control flow instructions.

3. What are various ARM Instruction Sets?

4. What are various features of ARM Instruction Sets?

5. Name any four data processing instructions.

6. List out various embedded ARM applications.

7. When the processor execution in ARM state?

8. Differentiate ARM, Thumb and jazelle state.

9. Mention various types of subroutines.

10 List any four coprocessor instructions.

Part-B (16 Marks)

1.(i).	State in detail about the (i) 3 stage pipelined ARM Organization (8) & 5 stage pipelined ARM Organization	(8)
(ii).	Explain the addressing modes of an ARM Processor with examples?	(8)
2.(i).	Examine the implementation of branch, call and return instructions in ARM instruction set?	(8)
(ii).	Illustrate the thumb instruction set of ARM processor with examples in detail	(8)
3.(i).	Describe the organization of CPU of a high performance RISC architecture.	(8)
(ii).	Discuss about ARM implementation	(8)

4.(i). Write detailed note on architectural support for high level languages (8)

(ii). Illustrate the ARM coprocessor interface (8)

5. Write short notes on embedded ARM applications (16)

Course Faculty **HoD**