MIT Art's, Commerce & Science College, Alandi
Question Bank
S.Y.B.Sc(Computer Science) Electronic Science Paper –I
8051 Microcontroller and Embedded System
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Chapter-1

Long answer questions:

1. Draw detailed functional block diagram of 8051 microcontroller.
2. Draw the block diagram of internal RAM and Explain concept of register banks.
3. Explain different flags in PSW.
4. List any 5 features of 8051. Compare Microprocessor & Microcontroller.
5. What is the difference between LCALL and ACALL.
6. How many ports are available in 8051? Explain any one port in detail.
7. Explain TMOD & TCON Register.
8. Explain different timer modes.
9. Explain classification of 8051 instruction set with example.
10. Classify different addressing modes in 8051 with example.

Short answer questions.

1. Name the register which doesn't have any address in 8051 microcontroller?
2. Name any 4 special function registers.
3. What is the function of pin XTAL1 and XTAL2?
4. What is the function of pin ALE.
5. Which port is bidirectional in 8051?
6. What is the function of $\overline{EA}$ / $\overline{PSEN}$?
7. Difference between DPTR and PC?
8. How many registers are present in one register bank?
9. How many register banks are present in internal RAM?
10. What is difference between MOVC and MOV instruction?

Chapter-2

Short answer questions:

1. Write alternate function of port 1/2/3 of 8051.
2. What will be the output of this instruction after execution.
          SETB P1,0
3. What is SFR?
4. List SFR which are associated with 8051.

5. Write the function of RST pin. (ALE pin)
6. Which port in 8051 needs pull up resistor and can be used as I/O.
7. Whether CPL P1 is valid instruction for 8051 or not, comment.

Long questions:
1. Write ranking for interrupt priority
2. What is Interrupt? Explain any two in detail for 8051.
3. Explain Timer/Control logic in 8051.
4. Explain serial data transmission modes in 8051 with timing diagram.
5. Write a program to monitor bit P1.3 when it is high and send 55H to port 2. (2 Marks)
   What are the advantages of bit addressing mode. (3 Marks)
6. Write a program for the generation of square wave with 50% duty cycle on bit 0 of port 1.
7. Identify addressing mode MOV @R0,A
8. What is stack? Explain PUSH and POP opcodes.
9. Explain external data moves instructions in 8051 to expand RAM and ROM memory space.
10. Write different instructions used in 8051 to exchange data.

Chapter-3

Questions for 1 marks:

1. State how many timer registers are available in 8051.
2. What is size of timer register in 8051?
3. State different modes in which timer registers are used?
4. What is significance of control world for timers in 8051?
5. Find the frequency and period used by the timer if crystal used in 8051 has following value:
   $$Xtal = 20 \text{ MHz}$$
6. What is the size of TMOD register in 8051?
7. What is the size of TCON register in 8051?
8. When timer mode register $M0 = 0$ and $M1 = 1$, Which operating mode supports 16 bit timer?
9. In TMOD register, state the significance (or role of) C/T bit of 8051.
10. Indicate mode and timer selected for the following:
    $$MOV \ \ TMOD,\#20H$$
11. Find the timer's clock frequency and its period for 8051 based systems with crystal Frequency of 16MHz.
12. What is role of 'GATE' bit of TMOD register in 8051?
13. When 8051 timers work as event counter?
14. How many timers do we have in 8051?

15. Assume that Xtal =16MHz, indicate when TF0 flag is raised for the following program:

    MOV TMOD,#01H
    MOV TL0,#10H
    MOV TH0,#F2H
    SETB TR0

Short answer questions 5 marks.
1. List the timer modes in 8051 along with their function.
2. What is control ward? How it is used to set the timer register?
3. Explain TMOD register in detail.
4. Write a program to generate a square wave with 50% duty cycle on P1.4 bit timer 0 is used to generate time delays. (Parameters can be changed)
5. Explain the steps in programming mode 1/ mode 2.
6. Programs based on counter / timers
7. List the steps for configuration counter in 8051.

Long answer questions.
1. Explain the timers in 8051.
        a. List the timers in 8051 with their functional mode.
        b. Example for delay calculation.

Chapter-4

Short answer question:

1. List the external hardware interrupts available in8051?
2. How 8051 services multiple interrupts?
3. Which timer of 8051 is used to set baud rate?
4. Name the pins of 8051 are used serial communication of data.
5. State the function of timer flag.
6. Which port of 8051 microcontroller is used for transmission of serial data?
7. What address in IVT is assigned to INT0 and INT1?

Long answer questions 5 marks.
1. List and explain interrupts in 8051.
2. State the steps taken by 8051 microcontroller when interrupt is generated.
3. What is the procedure for enabling and disabling the interrupts?
4. Explain serial data programming with 8051 for transfer of data.
5. Write a program to transfer letter 'A'serially at 9600 baud continuously. Xtal frequency is 16MHz.
6. State the format of SCON register. State the function of each bit in it.
7. Write a subroutine to initialize 8051 serial port to operate in mode 0 for transmission .
8. Explain the role of time1 in serial communication.

Chapter-5

Short answer question:

1. List the advantages of serial ADC.
2. Write a program to generate square wave on port 0 using DAC.
3. Explain the need of ADC & DAC.
4. Write a software to show how a command word can be written into the control register of the LCD.
5. Explain in short how DAC can be interfaced to 8051.

Chapter-6

Questions for 1 marks:

1. Define Embedded system.
2. write classification with respect to size.
3. Classify embedded system based on time constraints.
4. Give 2 examples of small / medium large scale embedded system
5. Give 2 examples of real time embedded and hard real time embedded.
6. what do you mean by single purpose processor?
7. what are ASIP?
8. Give two examples of ASIP.
9. Give two examples of general purpose processor.
10. What is SOC?

Questions for 5 marks

1. Give detail classification of embedded system with examples?
2. Define embedded system and give classification.
3. Discuss main components of embedded system.
4. Explain the components of embedded system hardware with the help of a block diagram.
5. List various processors in embedded system with suitable examples?
6. What is SOC? What are different components of embedded in SOC?