KINGS

COLLEGE OF ENGINEERING

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

QUESTION BANK

SUBJECT NAME : MICROPROCESSORS AND MICROCONTROLLER

YEAR / SE M : III / VI

UNIT-I
8085 PROCESSOR

PART-A (2 marks)

1. What is the need for ALE signal in 8085 microprocessor?
2. How many machine cycles are needed to execute STA 1800?
3. What is the need for interfacing?
4. Compare memory mapped I/O and peripheral mapped I/O.
5. What is memory mapping?
6. What is interfacing?
7. What are Hardware interrupts?.
8. What are Software interrupts,
9. What is interrupt?
10. What is vectored and non vectored interrupts?
11. What is the need for timing diagram?
12. Define i) Instruction cycle
    ii) Machine cycle
13. Define T-state and In which T-cycle the ALE signal is activated?
14. What is masking and why it is needed?
15. What are the different addressing modes of 8085?

PART-B (16 marks)

1. Describe the functional pin diagram of 8085. (16 Marks)
2. Describe the functional block diagram of 8085. (16 Marks)
3. Explain the 8085 interrupt system in detail. (16 Marks)
4. Explain various machine cycles supported by 8085. (16 Marks)
5. a) With suitable examples explain how I/O devices are connected using memory mapped I/O and peripheral I/O. (10 Marks)
   b) Design a microprocessor system to interface an 8K × 8 EPROM and 8K × 8 RAM. (6 Marks)
6. Draw timing diagrams for the following instruction with appropriate control and status signal. Explain in brief. CALL 2000 (16 Marks)

7. Explain the addressing modes of 8085 with example. (16 Marks)
8. Explain the Different types of instruction in 8085. (16 Marks)
9. Write the program to count from 0 to 9 with a one second delay between each count. At the count of 9, the counter should reset itself to 0 and repeat the sequence continuously. Use register pair HL to set up the delay, and display each count at one of the output ports. Assume clock frequency of the 8085 microprocessor as 1MHz. (16 Marks)

UNIT-II
PERIPHERALS INTERFACING OF 8085

PART-A (2 marks)

1. List the operation modes of 8255
2. Define PPI.
   Define USART.
3. What is key debouncing?
5. How a keyboard matrix is formed in keyboard interface using 8279?
6. Name any two type of ADC'S. .
7. What is the output modes used in 8279?
8. What are the modes used in keyboard modes?
9. What are the modes used in display modes?
10. How the RS -232C serial bus is interfaced to 1TL logic device?

PART-B (16 marks)

1. Explain any one of the modes of 8255 in detail. (16 Marks)
2. With neat block diagram explain PPI. (16 Marks)

3. i) Using model, write a program to communicate between two microprocessors using 8255. (10 Marks)
   ii) Show the control word format of 8255 and explain how each bit is programmed. (6 Marks)
4. With neat block diagram explain the functions of 8251. (16 Marks)
5. i) Bring about the features of 8251. (6 Marks)
   ii) Discuss how 8251 is used for serial communication of data. (6 Marks)
   iii) Explain the advantages of using the USART chips in microprocessor based systems. (4 Marks)
6. Design an interface circuit needed to connect DIP switch as an input device and display the value of the key pressed using a 7 segment LED display. Using 8085 system, write a program to implement the same. (16 Marks)
7. i) Explain the advantages of using the keyboard and display controller chips in microprocessor based system. (6 Marks)
   ii) Write a program using RST 5.5 interrupt to get an input from keyboard and display it on the display system. (6 Marks)
   iii) Use RST 5.5 instead of RST 7.5 and change mask pattern accordingly. (4 Marks)
8. With neat diagram explain the ADC interface to microprocessor. (16 Marks)
9. Explain in detail the RS 232C interface. (16 Marks)

10. i) How data is transformed by I^2C Bus? Explain with timing diagram?
    ii) What are different modes of I^2C Bus? Explain in detail. (16 Marks)
11. Write a short note on GPIB. (16 Marks)

UNIT-III
8086 MICROPROCESSOR

PART-A (2 marks)

1. Define pipelining?
2. Discuss the function of instruction queue in 8086?
3. What is the maximum memory size that can be addressed by 8086?
4. What is the function of the signal in 8086?
5. What are the predefined interrupts in 8086?.
6. What are the different flag available in status register of 8086?
7. List the various addressing modes present in 8086?
8. How single stepping can be done in 8086?
9. State the significance of LOCK signal in 8086?
10. What are the functions of bus interface unit (BIU) in 8086?
11. What is the clock frequency of 8086?
12. What are the two modes of operations present in 8086?
13. Explain the process control instructions
14. What is the purpose of segment registers in 8086?
15. What are the three classifications of 8086 interrupts?
16. What are the functions of status pins in 8086?
17. Give the instruction set of 8087?.
18. How do 8086 interrupts occur?
19. What are the 8086 interrupt types?
20. What is interrupt service routine?
21. What is interfacing?
22. What is meant by interrupt?

PART-B (16 marks)

1. Discuss the various addressing modes of 8086 microprocessor. (16 Marks)
2. Explain the internal block diagram of 8086. (16 Marks)
3. Draw the pin diagram of 8086 CPU with its control signals. (16 Marks)
4. Explain various data addressing modes of 8086 with the help of examples. (16 Marks)
5. Explain the interrupt mechanism, types and priority of 8086 microprocessor. (16 Marks)
6. Explain the instruction set of 8086 microprocessor. (16 Marks)
7. i) Describe what happens to the status flags as the sequence of instructions that follows is executed in 8086 microprocessor architecture. (8 Marks)
   Assume that flags ZF, SF, CF, AF, OF and PF are initially reset.

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MOV AX, 1234H
MOV BX, 0ABCDH
CMP AX, BX.
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ii) List out the shift instructions and rotate instructions in 8086. Give example for each. (8 Marks)

8. ii) Draw the structure of 8086 flag register and explain the function of the flags with examples. (8 Marks)
   ii) Explain the functions of following 8086 signals.
   1. HLDA 2. RQ/GTO 3. DEN 4. ALE (8 Marks)

UNIT-IV
8051 MICROCONTROLLER
PART-A (2 marks)

1. What is Microcontroller?
2. List the features of 8051 microcontroller.
3. Name the five interrupt sources of 8051?.
4. Explain the contents of the accumulator after the execution of the following program segments:
5. Write a program to load accumulator A, DPH and DPL with 30H.
6. Write a program to subtract the contents of R1 of Bank0 from the contents of R0 of Bank2.
7. What is the difference between the Microprocessors and Microcontrollers?
8. Explain the functions of the pin PSEN of 8051.
9. Name the special functions register SP of 8051.
10. How the program memory is organized in 8051 based system?

PART-B (16 marks)

1. Describe the architecture of 8051 with neat diagram. (16 Marks)
2. i) Discuss the peripheral interface of 8051. (8 Marks)
   ii) Explain the memory structure of 8051. (8 Marks)
3. Explain the interrupt structure of 8051 microcontroller Explain how interrupts are prioritized. (16 Marks)
4. Explain the I/O port structure of 8051. (16 Marks)
5. Explain the different serial communication modes in 8051. (16 Marks)
6. Explain the function and operating modes of timer in 8051. (16 Marks)
7. Explain the functional pin diagram of 8051 Microcontroller. (16 Marks)

UNIT-V
8051 PROGRAMMING AND APPLICATIONS
PART-A (2 marks)

1. Explain the operating mode0 of 8051 serial ports?
2. Explain the operating mode2 of 8051 serial ports?
3. Explain the mode3 of 8051 serial ports?
4. Write A program to perfom multiplication of 2 nos using 8051?
5. List the addressing modes of 8051?
6. Write about CALL statement in 8051?
7. Write about the jump statement?
8. Write program to load accumulator ,DPH,&DPL using 8051?
9. What is subroutine or procedure?

10. What is the function of SWAP?
11. What is Assembly Language Program?
12. What is debugging?

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PART-B (16 marks)

1. i) Write 8051 ALP to read data from port I when negative edge triggered at INT0 and supply the data to port 2 by masking the upper 4 bits. (8 Marks)
   ii) Write 8051 ALP to transmit 'Hello World' to PC at 9600 baud for external crystal frequency of 11.0592MHz. (8 Marks)
2. With a neat circuit diagram explain how a 4 x 4 keypad is interfaced with 8051 microcontroller and write 8051 ALP for keypad scanning. (16 Marks)
3. Draw the schematic for interfacing a stepper motor with 8051 microcontroller and write 8051 ALP for changing speed and direction of motor. (16 Marks)
4. Draw the schematic for interfacing a servo motor with 8051 microcontroller and write 8051 ALP for servo motor control. (16 Marks)
5. Explain the instruction set of 8051 microcontroller. (16 Marks)
6. i) Add the unsigned number found in 8051 microcontroller internal RAM locations 25h, 26h and 27h together and put the result in RAM locations 30h (MSB) and 31h (LSB). (6 Marks)
   ii) List out the arithmetic operations of 8051 microcontroller with an example and show how the flags are affected for each operation. (10 Marks)
7. i) Write the Analog to Digital conversion program in 8051 microcontroller to convert analog data into digital. Digitalize the input for every 100µs and store the 1000 values in external RAM location 4000b to 43E7h. (8 Marks)
   ii) Explain the JUMP instructions present in 8051 microcontroller with a mnemonic code and its operation for each. (8 Marks)

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