EC8691 MICROPROCESSORS AND MICROCONTROLLER

IMPORTANT QUESTIONS AND QUESTION BANK

UNIT I - THE 8086 MICROPROCESSORS

2-Marks

1. Identify the difference between a MP and CPU?
2. Recall about Stack Register?
3. Define stack segment register?
4. What are the assembler directives there in 8086?
5. Outline the different type of addressing modes of 8086?
6. Classify the program control instructions available in 8086?
7. Show how the 2byte INT instruction can be applied for debugging?
8. Mention any four miscellaneous instructions in 16bit processor?
9. Point out the string instructions available in 8086?
10. Conclude about modular programming?

Part-B

1. Outline the use of the following assembler directives: DD, ASSUME, EQU? Explain about the Interrupt handling process in 8086?
2. Write an 8086 ALP to convert BCD data to Binary data? Identify the conditions which cause the 8086 to perform type 0 and type 1 interrupt?
3. Describe the internal architecture of 8086 Microprocessor with neat diagrams?
4. Examine the various addressing modes available in 8086. Explain each mode with an example?
5. Explain the data transfer, arithmetic and branch instructions of 8086 microprocessor with examples?
6. Define interrupts and their types. Write in detail about interrupt service routine?
7. Point out the Procedures, Macros and Interrupt Service Routines?
8. Relate how to create and execute a program using modules?
9. Generalize the concept of byte and string manipulation with an example?
10. Develop a program to transfer 50 bytes of data from memory location starting from 2000H to 3000H using the string instruction MOVSB?

11. How does one define and call macro parameters of 8086 microprocessor? Express the operand formats for the addressing modes with examples?
12. Criticize about instruction formats and instruction execution timing?
13. Develop an algorithm and write ALP for sort a given array in Ascending and Descending order with array of length10 using 8086 Microprocessor?
14. Write an assembly language program for performing the Multiplication and Division of 16bit numbers using 8086 Microprocessor?
15. Explain in about the indirect addressing mode in 8086? Design an ALP in 8086 to multiply two 16-bit numbers?

UNIT II - 8086 SYSTEM BUS STRUCTURE

2-Marks

1. Define Bus?
2. State about External & Internal Bus?
3. How would you explain two modes of operation in 8086?
4. What is the need of LOCK signal?
5. Can you recall about Multiprogramming?
6. State the queue status of QS_1 and QS_0
7. Draw the timing diagram of Interrupt acknowledgement on a minimum mode system?
8. Compare minimum mode and maximum mode of operation?
9. Illustrate the states of process management?
10. Write some examples of advanced processors?

Part-B

1. **Examine** all the pin functions of 8086 processor configured in the maximum mode?
2. **Discuss** about the signals involved in minimum mode operation of 8086 with a microprocessorbased system with the timing diagram?
3. **How** would you explain the system bus timing of 8086?
4. **With** necessary diagrams, examine the operations of I/O programming in detail?
5. **Point** out and explain the following (i)Memory Management and Virtual Memory (ii)Multiprogramming (iii)Semaphore?
6. (i)**Design** the block diagram of Polling method? (ii)**Compare** closely coupled configuration with loosely coupled configuration?
7. (i) **Draw** the block diagram of daisy chaining method and explain? (ii)**Mention** the advantages of multiprocessor configurations?

8. **Develop** the different schemes used for establishing priority in multiprocessor configuration?
9. (i) **Sketch** the synchronous diagram between 8086 and its Coprocessor? (ii) **Show** how the inter processor communication through shared memory?
10. **State** the closely coupled configuration of multi-processor configuration with suitable diagram?
11. (i)**Write** down the comparison of minimum mode and maximum mode pins? (ii) **Draw** the timing diagram for the execution of the 8086 MOV instructions?
12. **Summarize** the timing diagram of memory read and memory write operations of 8086 microprocessor and explain in detail?
13. **With** nece4ssary illustrations write the execution steps of 8087 Coprocessor? **Explain** the architecture of 80286?
14. **Design** the block diagram of Polling method?
15. **Compare** closely coupled configuration with loosely coupled configuration?

UNIT-3

2-Marks

1. State the advantage and disadvantage of parallel communication over serial communication?
2. Define the terms A/D & D/A convertor?
3. List the four display modes of 8279 keyboard and display controller?
4. Name the applications of programmable interval timer?
5. Write the various modes of 8254 timer?
6. Classify the output modes used in 8279?
7. What is meant by key bouncing?
8. How would you use terminal count register?
9. Mention the applications of 8251 IC chip?
10. Examine the features of mode 1 used in 8255?

Part-B

1. With neat block diagram, explain the description and function of 8259?
2. Discuss how to interface an LCD display with 8086 Microprocessor? Write a program to display a character using LCD display?
3. With neat diagram, describe the internal structure of key board and display controller?
4. How do you interface a keyboard and the display using keyboard/display controller?

5. Relate how to interface a DMA controller with a microprocessor? Assess how DMA controller transfers large amount of data from one memory locations to another memory location?
6. Discuss how a PIC, 8259 is interfaced to an 8086 based system. How does 8259 service an interrupt?
7. Describe the internal architectural diagram of the 8237and explain how it functions as a DMA controller?
8. List the different DMA transfer modes supported by a DMA controller and explain these modes?
9. Outline the features and explain the operation of 8254 Programmable Interval Timer with diagram, and also explain the various modes of operation?
10. List the steps involved in interfacing an alarm controller with 8086 microprocessor and explain in detail?
11. (i) Manipulate DAC converter with block diagram? (ii) How is D/A converter interfaced with 8086?
12. (i) Draw the block diagram of traffic light control system using 8086? (ii)Write the algorithm and ALP for traffic light control system?
13. Explain the operation of serial communication interface with a neat diagram?
14. (i) Justify how D/A and A/D interfacing done with 8086 with an application? (ii)What is DMA? Generalize the concepts of DMA based data transfer using DMA controller?
15. Explain the 8251 USART with neat block diagram and its mode word, command word and status word?

UNIT IV-MICROCONTROLLER

2-Marks

1. Write the size of memory systems used in 8051 Microcontroller?
2. Identify the different operand types used in 8051?
3. List the counters available in 8051?
4. Label the register bank of 8051?
5. Classify operand addressing mode in 8051?
6. Summarize the place a specific value in the DPTR register?
7. What is meant by PSW in 8051?
8. Illustrate the CJNE, DJNZ instruction?
9. Predict the port used as multifunction port and list the signals?
10. Show the bit manipulation instructions? Give two examples?

Part-B

1. Illustrate in detail about the architecture of 8051 microcontroller with neat diagram?
2. Write an ALP using 8051 instructions to receive bytes of data serially and put them in P1. Set the baud rate at 4800, 8-bit data, and 1 stop bit?
3. (i)Give PSW of 8051 and describe the uses of each bit? (ii)Summarize the functions of the following signals in 8051: RST, EA, PSEN and ALE?
4. Describe the memory organization and SFR area of 8051microcontroller?
5. (i) Demonstrate in detail about arithmetic and control instruction set in 8051? (ii)Write a program to multiply the given number 48H and 30H using 8051?
6. Outline the I/O ports of 8051 microcontroller in detail?
7. (i) Discuss in brief the various registers in 8051 Microcontroller? (ii) Discuss the internal memory organization of 8051 Microcontroller?
8. (i)Tabulate the comparisons of CALL, RET and PUSH, POP instructions? (ii) Describe the following 8051 instructions with an example: DA, MUL, SWAP and SJMP?
9. State and explain the working of the 8051 Microcontroller?
10. Identify the rotate and swap instructions with an example for each?
11. (i)Explain in detail about the SFR's in 8051? (ii)Write an ALP in 8051 to convert a 16bit binary number to ASCII?
12. Draw the pin diagram of 8051 microcontroller and explain the functions of each bit?
13. Write a brief note on external data move operations in 8051?
14. (i) Summarize block diagram how to access external memory devices in an 8051 based system? (ii)Explain the Boolean processing capabilities of an 8051 microcontroller?
15. (i)What are the functional blocks available in 8051? Explain with a block diagram?
    (ii)Tabulate the program control instructions of 8051 and explain any five of them?

UNIT V- INTERFACING MICROCONTROLLER

2-Marks

1. What are the types of sensors used for interfacing?
2. Mention the advantages of microprocessor based system design?

3. List out the classifications of stepper motor?
4. How to change the stepper motor direction?
5. Identify the features of serial port in Mode-0?
6. Show the difference microprocessor and microcontroller?
7. State in your own words how is stepper motor interfaced with 8051?
8. What is the main idea of PWM in motor control using microcontroller?
9. Discover the difference between polling and interrupt?
10. Illustrate your understanding on interrupt priority in 8051?

Part-B

1. **Discuss** about serial port interface of 8051?
2. **Recognize** the different addressing modes in 8051 Microcontroller with an example?
3. microcontroller with an example? (ii) **Describe** the following 8051 instructions with an example: DA, MUL, SWAP and SJMP?
4. **State** and explain the working of the 8051 Microcontroller?
5. Discuss the process and function of 8051 Microcontroller instructions for performing data transfer and logical operations with suitable examples?
6. **Draw** the pin diagram of 8051 microcontroller and explain the functions of each bit?
7. **Write** a brief note on external data move operations in 8051?
8. **Write** an 8051 ALP to add three BCD numbers stored in internal RAM locations 25H, 26H and 27H and put the result in RAM locations 31H (MSB) and 30H (LSB). Use Register R0 to store the intermediate result?
9. **Summarize** block diagram how to access external memory devices in an 8051 based system?
10. **What** are the functional blocks available in 8051? Explain with a block diagram?
11. **Tabulate** the program control instructions of 8051 and explain any five of them?
12. Compose the functions of the signals present in 8051 with recovery diagrams?
13. **Summarize** block diagram how to access external memory devices in an 8051 based system?
14. Explain the the Boolean processing capabilities of an 8051 microcontroller? **Tabulate** the program control instructions of 8051 and explain any five of them?
15. Explain the Boolean processing capabilities of an 8051 microcontroller?