

**D 121323**

(Pages : 2)

Name.....

Reg. No.....

**FOURTH SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)  
EXAMINATION, APRIL 2025**

(CBCSS)

Physics

PHY4E23—MICROPROCESSORS, MICROCONTROLLERS AND APPLICATIONS

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

**Section A***8 Short questions, each answerable within 7.5 minutes.**Answer **all** questions.**Each question carries weightage 1.*

1. Differentiate between Small Scale Integration (SSI) and Medium Scale Integration (MSI).
2. What is a Microprocessor ?
3. What is interrupt ?
4. What are the different applications of 8253 ?
5. What is an address space ?
6. In the ATmega32, how many pins are designated as I/O port pins ?
7. An embedded system is also called a dedicated system. Why ?
8. Explain AVR microcontroller I/O points.

(8 × 1 = 8 weightage)

**Section B***4 Essay questions, each answerable within 30 minutes.**Answer any **two** questions.**Each question carries weightage 5.*

9. Discuss various types of addressing modes of Intel 8085 instructions ? Give examples for each type of data format.

**Turn over**

10. Explain memory and I/O interfacing with schematic diagrams.
11. With a neat block diagram explain the general purpose registers in the AVR.
12. Explain I/O ports forms and functions. Discuss the features of ports A, B, C, and D. Explain the dual role of ports.

(2 × 5 = 10 weightage)

### Section C

*7 Problems answerable within 15 minutes.*

*Answer any **four** questions.*

*Each question carries weightage 3.*

13. Write an assembly language programme to divide 54H by 09.
14. Write an assembly language programme for the following operation : F8H-9BH.
15. Write instructions to load value 0 × 95 into the SPL I/O register.
16. Show the status of the C, H, and Z flags after the addition of 0 × 38 and 0 × 2F in the following instructions :  

```
LDI R16, 0 × 38
LDI R17, 0 × 2F
ADD R16, R17 ; ADD 17 TO R16
```
17. Find the sum of the values 0 × 79, 0 × F5, and 0 × E2. Put the sum into R20 (low byte) and R21 (high byte).
18. Write a test program for the AVR chip to toggle all the bits of PORTB, PORTC, and PORTD every ¼ of a second. Assume a crystal frequency of 1 MHz.
19. Write an AVR C program to send hex values for ASCII characters of 0, 1, 2, 3, 4, 5, A, B, C, and D to Port B.

(4 × 3 = 12 weightage)

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Name.....

Reg. No.....

**FOURTH SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)  
EXAMINATION, APRIL 2024**

(CBCSS)

Physics

PHY 4E 23—MICROPROCESSORS, MICROCONTROLLERS AND APPLICATIONS

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

**Section A***8 Short questions, each answerable within 7.5 minutes.**Answer all questions.**Each question carries weightage 1.*

1. What is a microprocessor ?
2. What is the difference between a microprocessor and a CPU ?
3. What is a Programmable Peripheral Interface (PPI) ?
4. Differentiate between microcontroller and microprocessor.
5. Explain the timing and control unit section of the CPU.
6. What is an address space ?
7. Define the term “embedded system”.
8. What is the advantage of bit-addressability for AVR ports ?

(8 × 1 = 8 weightage)

**Section B***4 Essay questions, each answerable within 30 minutes.**Answer any two questions.**Each question carries weightage 5.*

9. Draw the block diagram and explain the internal architecture of Intel 8085.
10. Explain the instruction cycle. Draw and explain the timing diagram for fetch operation.

**Turn over**

11. What are different operating modes of 8255 ? Discuss how to determine the control word for 8255.
12. Explain I/O ports forms and functions. Discuss the features of ports A, B, C, and D. Explain the dual role of ports

(2 × 5 = 10 weightage)

### Section C

*7 Problems answerable within 15 minutes.*

*Answer any **four** questions.*

*Each question carries weightage 3.*

13. Write an assembly language programme to find the smallest numbers of a series : 86, 58, and 75.
14. Write an assembly language programme for multiplying 84 H by 56 H.
15. Write instructions to add the values 0 × 16 and 0 × CD. Place the result in the R19 register.
16. Show the status of the C, H, and Z flags after the addition of 0 × 9C and 0 × 64 in the following instructions :

LDI R20, 0 × 9C

LDI R21, 0 × 64

ADD R20, R21 ; ADD R21 TO R20

17. Frame control word for the following configuration of the ports of Intel 8255 for Mode 0 operation:

Port A – input

Port B – input

Port C<sub>upper</sub> – input

Port C<sub>lower</sub> – input

18. Write a program to determine if RAM location 0 × 200 contains the value 0. If so, put 0 × 55 into it.
19. Write an AVR C program to send values 00 – FF to Port B.

(4 × 3 = 12 weightage)

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Name.....

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**FOURTH SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)  
EXAMINATION, APRIL 2023**

(CBCSS)

Physics

PHY 4E 23—MICROPROCESSORS, MICROCONTROLLERS AND APPLICATIONS

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

**Section A***8 Short questions answerable within 7½ minutes.**Answer **all** questions, each carries weightage 1.*

1. Briefly describe Port C of the AVR and explain some of its functions.
2. Distinguish between the variables- long and long long used for AVR programming.
3. Explain the purpose of EEPROM.
4. Explain the concept of formation of a control word.
5. Briefly explain the different memory interface schemes.
6. What are the important features of the Shift instruction in microprocessor ?
7. Briefly explain how an ADC works.
8. Enlist and explain any three control signals of 8085 microprocessor.

(8 × 1 = 8 weightage)

**Section B***4 essay questions answerable within 30 minutes.**Answer any **two** questions, each carries weightage 5.*

9. With suitable examples explain the addressing modes of 8085 microprocessor.
10. With a neat schematic explain the architecture of the 8085 microprocessor.
11. Explain the data transfer schemes of 8085 based on DMA.
12. Explain features of the I/O ports of AVR.

(2 × 5 = 10 weightage)

**Turn over**

## Section C

7 problems answerable within 15 minutes.

Answer any **four** questions, each carries weightage 3.

13. What does the below code implement in AVR ?

```
{  
    ADC0_CTRLA &= ~ADC_ENABLE_bm;  
}
```

14. Write the AVR code line for “PORTB set to tri-state inputs”

15. Write a programme to multiply two 8 bit numbers stored at address 2050 and 2051 and store the result at the address 3050 and 3051.

16. Write an assembly level programme to find the largest number among numbers in an array starting at address 5000 and store it at the address 6000.

17. What logic operation is implemented with the below program in AVR ?

```
int main()  
{  
    DDRB = 0xff;  
    PORTB = 0x00;  
    while (1)  
    {  
        delay_ms(500);  
        tbi(PORTB, PB0);  
    }  
    return 0;  
}
```

18. Find 2's compliment with carry of an 8 bit number stored at address 2050. Result is to be stored at address 3050 and 3051. Starting address of program is taken as 2000.

19. Write a programme to multiply two 8 bit numbers stored at address 2050 and 2051 and store the result at the address 3050 and 3051.

(4 × 3 = 12 weightage)

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Name.....

Reg. No.....

**FOURTH SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)  
EXAMINATION, APRIL 2022**

(CBCSS)

Physics

PHY 4E 23—MICROPROCESSORS, MICROCONTROLLERS AND APPLICATIONS

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

**General Instructions**

1. *In cases where choices are provided, students can attend **all** questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *The instruction if any, to attend a minimum number of questions from each sub section / sub part / sub division may be ignored.*
4. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

**Section A**

8 Short questions, each answerable within 7.5 minutes.

Answer **all** questions.

Each carries weightage 1.

1. Briefly describe Port D of the AVR and explain some of its functions.
2. Write short note on three C language data types for AVR programming. Any three data types, their size, their domain etc to be described by student.
3. Distinguish between ROM and RAM.
4. With an example explain a programmable peripheral interface ?
5. Explain branching operations in assembly level programming.
6. Explain Programmed I/O.
7. Enlist the programmable register of 8085 microprocessor.
8. Explain the logical instructions of 8085 microprocessor.

(8 × 1 = 8 weightage)

**Turn over**

**Section B**

*4 essay questions answerable within 30 minutes.*

*Answer any **two** questions.*

*Each carries weightage 5.*

9. With a neat diagram explain the instruction cycle in 8085 microprocessor.
10. With suitable examples explain the interrupts of 8085 microprocessor.
11. Explain the data transfer schemes of 8085 based on DMA.
12. With a schematic diagram explain the architecture of the AVR.

(2 × 5 = 10 weightage)

**Section C**

*7 problems answerable within 15 minutes.*

*Answer any **four** questions.*

*Each carries weightage 3.*

13. Write the line code by which a bit can be set using macro definitions in AVR.
14. Write the code lines for AVR so that “All PORTA pins are set as inputs with pull-ups enabled and then read data from PORTA”
15. Write an assembly level programme for the division of two 16 bit numbers stored at consecutive address.
16. What logic operation is implemented with the below program in AVR ?

```
int main()
{
  DDRB = 0xff ;
  PORTB = 0x00 ;
  while(1)
  {
    delay_ms(500) ;
    tbi(PORTB, PB0) ;
  }
  return 0 ;
}
```

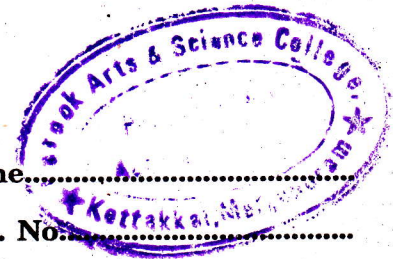
17. Find 2's complement with carry of an 8 bit number stored at address 2050. Result is to be stored at address 3050 and 3051. Starting address of program is taken as 2000.
18. Write a programme to multiply two 8 bit numbers stored at address 2050 and 2051 and store the result at the address 3050 and 3051.
19. Write a program using C for AVR micro controller such that it will “Turn LED On when Button are Pressed based on Bit Positions”.

(4 × 3 = 12 weightage)

C 2072

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Name.....  
Reg. No.....



**FOURTH SEMESTER M.Sc. DEGREE (REGULAR) EXAMINATION  
MARCH 2021**

(CBCSS)

Physics

**PHY 4E 20—MICROPROCESSORS, MICROCONTROLLERS AND APPLICATIONS**

(2019 Syllabus Year)

Time : Three Hours

Maximum : 30 Weightage

**General Instructions**

1. *In cases where choices are provided, students can attend all questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

**Section A**

*8 Short questions answerable within 7.5 minutes.*

*Answer all questions, each question carries weightage 1.*

1. Briefly describe Port B of the AVR and explain some of its functions.
2. Write short note on the following variable for AVR programming-unsigned char, unsigned int and unsigned long.
3. Distinguish between a micro-controller and a micro-processor.
4. What is a DMA controller ?
5. Explain concept of address space partition and its implementation in 8085 microprocessor.
6. Define- (1) Instruction cycle ; (2) Machine cycle ; and (3) T-state
7. Enlist the different functional groups of 8085 microprocessor instruction set.
8. Briefly explain the timing and control unit of 8085 microprocessor.

(8 × 1 = 8 weightage)

**Turn over**

**Section B**

*4 essay questions answerable within 30 minutes.*

*Answer any two questions, each question carries weightage 5.*

9. Describe the architecture of the Intel 8255 programmable peripheral interface. Explain the different modes of operation.
10. Explain memory mapped I/O interfacing scheme in 8085 microprocessor.
11. With a neat schematic explain the architecture of the 8085 microprocessor.
12. Explain features of the I/O ports of AVR.

(2 × 5 = 10 weightage)

**Section C**

*7 problems answerable within 15 minutes.*

*Answer any four questions, each question carries weightage 3.*

13. Write an assembly level programme to find the square root of a number.
14. Write a program in 8085 microprocessor to sort numbers in ascending order in an array of  $n$  numbers, where size " $n$ " is stored at memory address 2000 : 500 and the numbers are stored from memory address 2000 : 501.
15. Find 2's compliment with carry of an 8 bit number stored at address 2050. Result is to be stored at address 3050 and 3051. Starting address of program is taken as 2000.
16. What logic operation is implemented with the below program in AVR ?

```
int main()  
{  
    DDRB = 0xff;  
    PORTB = 0x00;  
    while(1)  
    {  
        delay_ms(500);  
        tbi(PORTB, PB0);  
    }  
    return 0;  
}
```

17. Write the code lines for AVR so that "All PORTA pins are set as inputs with pull-ups enabled and then read data from PORTA".
18. Write the AVR code line for "PORTB set to tri-state inputs".
19. Write an assembly level programme to find the smallest number among numbers in an array starting at address 5000 and store it at the address 6000.

(4 × 3 = 12 weightage)

**C 80728**

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Name.....

Reg. No.....

**FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, MARCH 2020**

(CUCSS)

Physics

**PHY 4E 20—MICROPROCESSORS AND APPLICATIONS**

(2017 Admission onwards)

Time : Three Hours

Maximum : 36 Weightage

**Section A**

*Answer all questions*

*Each question carries weightage 1.*

1. Draw the schematic of the timing and control unit of 8085 microprocessor.
2. Enlist different DMA schemes.
3. Enlist the programmable register of 8085 microprocessor.
4. What are the important features of the Shift instruction in microprocessor ?
5. Explain Memory mapped I/O scheme of 8085 microprocessor.
6. Explain a Sample and hold circuit.
7. Explain the concept of formation of a control word.
8. Explain features of 8279 DMA controller.
9. Explain the working of the 7448 driver.
10. With an example explain a programmable peripheral interface.
11. Explain the working of 8253 interface.
12. Explain the use of "POP" in 8051 microcontroller.

(12 × 1 = 12 weightage)

**Section B**

*Answer any two questions.*

*Each question carries weightage 6.*

13. With suitable examples explain the addressing modes and interrupts of 8085 microprocessor.
14. Explain the programmable communication interface of 8251 for serial data transfer.

**Turn over**

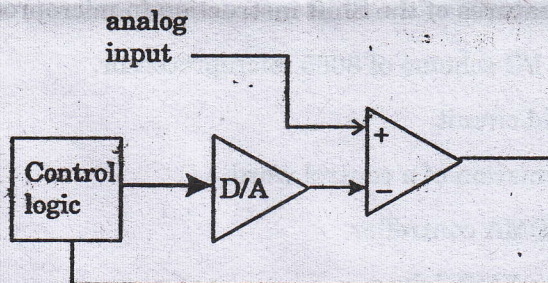
15. Explain the working of an ADC 0800 8-bit A/D converter.
16. With a block diagram explain the architecture of 8051 microcontroller and explain its salient features. Describe the various registers.

(2 × 6 = 12 weightage)

### Section C

*Answer any four questions.  
Each question carries weightage 3.*

17. Write an assembly level programme to find the largest number among numbers in an array starting at address 5000 and store it at the address 6000.
18. Find 2's compliment with carry of an 8 bit number stored at address 3050. Result is to be stored at address 8050 and 8051. Starting address of program is taken as 2000.
19. Explain machine cycle in a microprocessor.
20. Explain the working of the following circuit

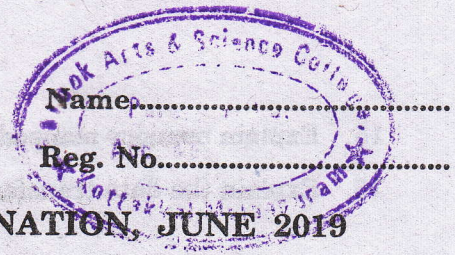


21. For a three bit D/A convertor with range 0-5 V what would be the highest output voltage ?
22. What will be the counting rate and clock frequency input of a timer for the 8051 micro controller having a oscillator frequency of 1.3 MHz ?

(4 × 3 = 12 weightage)

C 61943

(Pages : 2)



**FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, JUNE 2019**

(CUCSS—PG)

Physics

PHY 4E 20—MICROPROCESSOR AND APPLICATIONS

(2017 Admissions)

Time : Three Hours

Maximum : 36 Weightage

**Section A**

*Answer all questions.*

*Each question carries weightage 1.*

1. Enlist the different functional groups of 8085 microprocessor instruction set.
2. Explain the instruction format of 8085 microprocessor.
3. Enlist and explain any three control signals of 8085 microprocessor.
4. Define- (1) Instruction cycle (2) T-state
5. Explain concept of address space partition and its implementation in 8085 microprocessor.
6. Briefly explain a memory interface scheme.
7. Explain features of programmable communication interface.
8. Explain the working of 8253 interface.
9. Explain the working of the 7448 driver.
10. Explain the use of microprocessor for measurement of (1) Voltage (2) Current.
11. Explain the functionality of the Data Pointer in 8051 microcontroller.
12. Explain the "B" Register in 8051 microcontroller.

(12 × 1 = 12 weightage)

**Section B**

*Answer any two questions.*

*Each question carries weightage 6.*

13. With circuit diagram explain the 8279 programmable keyboard interface.
14. With a block diagram explain the architecture of 8051 microcontroller and explain its salient features. Describe the various registers.

Turn over

15. Explain memory mapped I/O interfacing scheme in 8085 microprocessor.
16. Explain the data transfer schemes of 8085 based on DMA.

(2 × 6 = 12 weightage)

### Section C

*Answer any four questions.*

*Each question carries weightage 3..*

17. Write a program in 8085 microprocessor to sort numbers in descending order in an array of  $n$  numbers, where size " $n$ " is stored at memory address 2000 : 500 and the numbers are stored from memory address 2000 : 501.
18. Find 2's compliment with carry of an 8 bit number stored at address 2050. Result is to be stored at address 3050 and 3051. Starting address of program is taken as 2000.
19. With a block diagram explain the flags in a 8085 microprocessor.
20. For a three bit D/A convertor with range 0- 3.3 V what would be the highest output voltage ?
21. Draw the timing diagram of the code "MVIB, 45".
22. Write a program for the 8051 micro controller to load a byte in the memory location 9000H and increment the contents of the memory location.

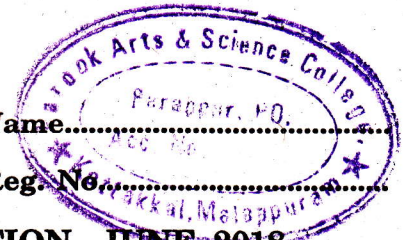
(4 × 3 = 12 weightage)

D 42572

(Pages : 2)

Name.....

Reg. No.....



**FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, JUNE 2018**

(CUCSS)

Physics

**PHY 4E 20—MICROPROCESSORS AND APPLICATIONS**

(2012 Admissions)

Time : Three Hours

Maximum : 36 Weightage

**Section A**

*Answer all questions.*

*Each question carries a weightage of 1.*

1. Explain the two's complement method in binary arithmetic.
2. What are the conditional branch instructions in 8085 microprocessor ?
3. What is the special use of HL register pair in 8085.
4. Explain the function of ALE signal in 8085 system.
5. Explain the function of clock in the microprocessor system.
6. Explain why I/O ports are necessary for interfacing peripheral devices ?
7. What is the function of the controller 8257 in 8085 processor system ?
8. Explain the working and show the application of an analog multiplexer.
9. Explain the application of the decoder 7448.
10. How a microcontroller is different from a microprocessor ?
11. Explain the role of special Function Registers in 8051.
12. Explain the use of stack in 8085.

(12 × 1 = 12 weightage)

**Section B**

*Answer any two questions.*

*Each question carries a weightage of 6.*

13. Using a suitable functional block diagram give a detailed description of the architecture of 8085 microprocessor.

**Turn over**

14. Discuss the function and working of the serial interfacing device 8251.
15. Show how to implement an A/D converter using D/A converter in the 8085 microprocessor system.
16. Give a detailed overview of the 8051 microcontroller.

(2 × 6 = 12 weightage)

### Section C

*Answer any four questions.*

*Each question carries a weightage of 3.*

17. In 8085 instructions, write a program for adding two 16 bit numbers.
18. Write a program in 8085 instructions for sorting 10 numbers in ascending order.
19. In a 8085 system the 20 no of 8 bit data are stored in consecutive memory locations. Write a program for finding the largest data value.
20. Draw a 4 to 16 decoder based circuit for address space partitioning in 8085.
21. Draw the interfacing circuit for ADC 0800.
22. Draw the timing diagram for 8085 during a memory read operation.

(4 × 3 = 12 weightage)

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Name.....

Reg. No.....

**FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, JUNE 2017**

(CUCSS)

Physics

**PHY 4E 20—MICROPROCESSORS AND APPLICATIONS**

(2012 Admissions)

Time : Three Hours

Maximum : 36 Weightage

**Section A**

*Answer all questions.*

*Each question carries 1 weightage.*

1. How many address lines are there in 8085 microprocessor and what is its significance ?
2. How many bit processor is 8085 microprocessor and why is it so ?
3. What is assembler directive ?
4. What is the role of ALE signal in 8085 processor ?
5. What are the signals in 8085 processor timing and control circuit used for Direct Memory access ?
6. How the Memory and I/O operations are differentiated in 8085 processor ?
7. What are the different modes of operations in 8255 PPI chip ?
8. What is 8251 chip used for ?
9. Name the different modes of operation in 8253 PTC chip.
10. What is the role of Sample and hold circuit ?
11. How microcontroller is different from microprocessor ?
12. What is known as flash converter ?

(12 × 1 = 12 weightage)

**Section B**

*Answer any two questions.*

*Each question carries 6 weightage.*

13. With the help of internal block diagram explain the architecture of 8085 microprocessor.
14. With the help of internal block diagram explain the function of 8255 PPI.
15. With the help of diagram explain the ADC circuit function which uses DAC internally.
16. With help of internal block diagram explain the 8051 microcontroller architecture.

(2 × 6 = 12 weightage)

**Turn over**

**Section C**

*Answer any four questions.  
Each question carries 3 weightage.*

17. Write an assembly level program for 8085 to sort  $n$  number of data in ascending order.
18. With the help timing diagram explain the Data read machine cycle in 8085 processor.
19. Explain how 8259 programmable interrupt controller is used to manage multiple interrupts.
20. Explain how a DMA controller is interfaced with microprocessor to handle data transfer.
21. Explain the Successive approximation technique used in ADC circuits.
22. Explain the Register and stack structure of 8051 microcontroller.

(4 × 3 = 12 weightage)

C-3543

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Name.....

Reg. No.....

**FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, JUNE 2016**

(CUCSS)

Physics

**PHY 4E 20—MICROPROCESSORS AND APPLICATIONS**

(2012 Admission onwards)

Time : Three Hours

Maximum : 36 Weightage

**Section A**

*Answer all questions.*

*Each question carries 1 weightage.*

1. Distinguish between a microcomputer from a general purpose computer.
2. In the 8085, why are 2-bit codes are used for specifying register pairs and 3-bit codes for specifying individual registers.
3. Show that the memory addressing capacity of a CPU is given by  $2^n$ , where  $n$  is the number of address lines of the CPU.
4. What is 2's complement of a binary number ? Explain with suitable example.
5. What is interfacing ?
6. Distinguish between instruction cycle and clock cycle.
7. Distinguish between machine language and assembly language.
8. Discuss how to determine the control word for 8255.
9. Discuss the different application of 8253.
10. What is DMA data transfer scheme ?
11. What are various operating modes of 8253 ?
12. What is a 7-segment LED display ? Discuss its applications.

(12 × 1 = 12 weightage)

**Section B**

*Answer any two questions.*

*Each question carries 6 weightage.*

13. Write an assembly language program to add two 8-bit numbers, the sum may be a 16-bits.  
What are the various types of data formats for Intel 8085 instructions ?

**Turn over**

14. Discuss in detail the various types of addressing modes of Intel 8085 with suitable example.
15. Explain enabling, disabling and masking of interrupts. Discuss with suitable examples how transfer data using interrupts.
16. Discuss the main features of ADC 0800. Explain how will you obtain clock signal for an A/D converter.

(2 × 6 = 12 weightage)

### Section C

*Answer any four questions.  
Each question carries 3 weightage.*

17. Add the binary numbers 10101110 and 01110101. Verify your result by using binary to decimal conversion.
18. It is desired to clear the accumulator of 8085 A. Write the possible instruction for this purpose.
19. Write a program for adding the contents of memory locations 2050 H and 2051 H and store the result in 2052 H.
20. Write down an assembly language program to find the smallest of N numbers.
21. Design a subroutines for the 8085 that multiplies two single-byte integers X and Y, and produces a 16-bit product. X and Y need not be natural numbers.
22. With a block diagram explain the function of Sample and Hold circuit.

(4 × 3 = 12 weightage)