

This question paper contains 4 printed pages]

Roll No.

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S. No. of Question Paper : 847

Unique Paper Code : 222302

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Name of the Paper : Microprocessor and Computer Programming (PHMT-308)

Name of the Course : B.Sc. (Hons.) Physics

Semester : III

Duration : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Question No. 1 is compulsory.

Attempt *two* questions each from Section A and Section B.

Attempt *five* questions in all.

1. Answer any *five* questions out of the following :

5×3=15

- (a) A microcomputer has 64 k memory. How many bytes does this represent ? If 0000H stands for the first memory location, what is the hexadecimal notation for the last memory location ? Explain your answer.
- (b) What are registers ? Give the full form and use of : A, PC and SP in 8085 microprocessor.
- (c) Explain the following instructions using suitable examples :
- (i) LDAX B
- (ii) LHLD 2050 H

P.T.O.

- (d) Compare the following instructions :
- (i) MVI A,25H
 - (ii) LDA 2050H
- (e) Explain the following instructions : RAR and RRC.
- (f) Determine the values of the following C/C++ expressions :
- (i) $(10 >= 6) \&\& (10 < 5)$
 - (ii) $(4 == 4) \|\ (5 == 8)$
- (g) Write the corresponding C/C++ expressions for the following mathematical expressions :
- (i) $p + q/(r + s)^4$
 - (ii) $(\cos x / \tan^{-1} x) + x$
- (h) What are the values of the following C/C++ expressions ?
- (i) $(3*12)\%(5*5)$
 - (ii) $!(3 > 5 \&\& 4 < 6)$
- (i) Explain the meaning of the following in C/C++
- struct student

```

{
    short rollno;
    short class;
    float marks;
    char grade;
};

```

student student1, student2;

Section A

(Answer any two)

2. (a) Draw the labelled pin out diagram of the 8085 microprocessor and explain in brief the function of each pin. 10
- (b) Show that bit position of various flags in the flag register of 8085 microprocessor. Mention the purpose of the flag register. 5
3. (a) Explain each step of the following assembly language program. Identify the contents of the accumulator after the execution of the last instruction :

LXI H,2040H

MVI M,59H

INR M

INX H

MVI M,90H

DCR M

MOV A,M

10

- (b) Write an assembly language program to multiply two 8-bit numbers (10H and 03H) using repeated addition. 5
4. (a) How is SIM instruction used to set interrupts ? Illustrate with an example. 5
- (b) Illustrate the steps and the timing of data flow when the instruction MVI B,35H is executed.

Instruction is stored at the memory location shown below :

Memory Address	Mnemonic	Hex Code
2000H	MVI B,35H	06H
2001H	?	35H

10

P.T.O.

Section B

(Answer any two)

5. (a) Write a C/C++ program to determine the roots of a quadratic equation for real, imaginary and equal roots. 8
- (b) Explain C++ data types with appropriate examples. 7
6. (a) Explain the difference between the following control structures in C/C++ giving examples of each : 8
- (i) if-else
- (ii) switch
- (b) What is significance of “break” in the “switch” statement in C/C++ ? 3
- (c) Write a C/C++ program to print the first 50 natural numbers and their sum. 4
7. (a) Explain the difference between a structure and an array with the help of suitable examples. 5
- (b) Write a C/C++ program to multiply two 3×3 matrices. 10