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S. No. of Question Paper : 6208

Unique Paper Code : 222302

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Name of the Paper : Microprocessor and Computer Programming—Paper PHHT-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.)

Attempt five questions in all.

Question No. 1 is compulsory.

Attempt two questions from each Section.

1. Answer any five of the following :

5×3

- (a) The memory address of the starting address of a 1K-byte memory chip is given as B8FEH. Specify the end address.
- (b) Calculate the time required to execute the instruction STA 16-bit. The microprocessor clock frequency is 3.0 MHz.
- (c) Explain the functions of the following pins in a 8085 microprocessor :
- (i) ALE
 - (ii) TRAP
 - (iii) READY.

P.T.O.

(d) In an 8085 microprocessor give the status of S_0 and S_1 signals for :

- (i) Opcode fetch and
- (ii) Memory read operation.

(e) Write the addressing modes for the following instructions :

- (i) ANI 85H
- (ii) MOV B, C
- (iii) LDAX D.

(f) What is the C/C++ value for :

- (i) $(3 * 12) \% (5 * 5)$
- (ii) $!(3 > 5 \ \&\& \ 4 < 6)$
- (iii) $4 + \left(\frac{3 * 4}{3 * (6 + 1)} \right)$

(g) Find and explain errors in the following program component :

```
float i;

int p = 0;

for (i = 0; i = 10; i += 2)
{
    p = i * 2;

    cout << i, p;
}
```

(h) Convert the following 'for' loop into a 'do-while' loop :

```
for (int i = 1; i <= n; i++)
    cout << i * i << " ";
```

(i) Evaluate (true or false) the following expressions :

(i) $3 > 6 \ \&\& \ 7 > 4$,

(ii) $3 > 6 \ || \ 7 > 4$.

(iii) $3 + 3 \ != \ 2 + 4$.

(j) If p is a pointer, what is the meaning of :

(i) *p

(ii) &p

(iii) (*p)++

Section A

(Answer any two)

2. (a) How is de-multiplexing of address and data buses done and control signals generated in 8085 microprocessor ? Explain with the help of a detailed schematic diagram.
- (b) Write a program to add two 8-bit numbers using indirect addressing mode. The starting address of program should be 31FBH. Store the input data at 2100H and the sum and carry at memory location 2102H and 2103H respectively. 10,5
3. (a) Explain each step of the following program and identify the contents of the register C, and the status of the flags S, Z, P and CY :

MVI A, FAH

LXI H, 2150H

MVI M, 9FH

ADD M

MOV C, A

HLT

- (b) Describe different addressing modes in 8085 microprocessor, give *one* example of each addressing mode. 10,5
4. (a) Write an assembly language programs to add two 16-bit numbers (FCAB H and 17BD H) without using 'DAD' instruction, and the sum is to be stored in memory locations 2007H and 2008H and carry at 2009H (if any).
- (b) Draw the logic pin out diagram of 8085 microprocessor wherein all the different signals are depicted and classified in different groups. 10,5

Section B

(Answer any two)

5. (a) Write a C/C++ program that generate first 100 prime numbers but prints every alternate value of them.
- (b) Distinguish between 'structure' and 'array'. Explain each with the help of suitable example. 10,5
6. (a) Distinguish between 'function call by value' and 'function call by reference' with the help of suitable example. Write C/C++ function to find the factorial of a number.
- (b) Write a program in C/C++ to sort a given list of numbers in ascending order using a void function. 10,5
7. (a) What is meant by 'Class' in C++ ? Explain with examples the following with reference to 'Class' :
- (i) public and private members in a class.
- (ii) constructor and destructor in a class.
- (b) Write a C/C++ program to find the imaginary roots of a quadratic equation. 10,5