[This question paper contains 4 printed pages.]

Sr. No. of Question Paper : 8402 **C** **Roll No.....**

Unique Paper Code : 222302

Name of the Paper : PHHT-308 : Microprocessor & Computer Programming

Name of the Course : B.Sc. (Hons.) PHYSICS, Part II

Semester : III

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **seven** questions in all.
3. Question No. **1** is compulsory.
4. Attempt **three** questions from each section.

1. Answer any **five** of the following. (5×3)

(a) A microcomputer has a 64*k* memory. How many bytes does this represent ? If 0000*H* 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.

(c) What is the function of the following signals in 8085 μP ?

Reset, Ready, Hold.

(d) Write instructions to enable all the interrupts in an 8085 system.

(e) Determine the values of the following expressions; given x = 2, ch = 'C' :

(i) 3/2 + 8.7 (ii) (14 >= 5) && ('A' < ch)

P.T.O.

(iii) 64 >> x (iv) static_cast<double> (17)/2

(v) (++x) + 3 (vi) y = x > 9 ? 10 : 20

(f) Determine the values of the following functions; given 'a' = 97, str = "Hello World" :

(i) abs(–24) (ii) ceil(89.54)

(iii) pow(36, 0.5) (iv) tolower('A')

(v) ispunct('&') (vi) str.size( )

(g) What is a preprocessor ? Give three uses of it.

(h) How is enumerated-type data defined ? Give two examples.

SECTION A

(Do any ***three*** questions from Section A)

2. Draw the functional block diagram of 8085 μP. (10)

3. What is the purpose of ALE signal ? Explain with the help of timing and circuit diagrams the demultiplexing of address bus in 8085 μP. (10)

4. (a) What are flags ? Describe the various flags in the flag register of 8085 μP. Which flags are used in *CPI* instruction and how. Which flags are affected by this instruction ? (7)

(b) Write a program in assembly language to add two numbers $53H$ and $A4H$ stored at memory locations $2000H$ and $2001H$ respectively. Store the result at $2002H$ and carry, if any, at $2003H$. (3)

5. (a) Distinguish between the instructions *MOV* and *MVI*. Give one example of each. (5)

(b) Write an assembly language program to multiply two 8-bit numbers 09*H* and 04*H*. Store the result in register D. (5)

6. (a) Explain the difference between the instructions *ANA* and *ANI*. Give one example of each. (5)

(b) Describe the instruction *RIM* by giving an example. (5)

SECTION B

(Do any ***three*** questions from Section B)

7. Explain the difference between the following Control Structures in C/C++ giving two examples of each.

if, *if–else*, and *switch* (10)

8. (a) Write a program in C/C++ to find the roots of a quadratic equation. Also check whether the roots are real or imaginary ? (6)

(b) Explain the difference between the C/C++ statements (i) break, and (ii) *continue*. Give two examples of each. (4)

9. (a) Explain the difference between the I/O formatting manipulators : *left* and *right*. (2)

(b) Write a C/C++ program to arrange a list of numbers in ascending order. (8)

10. (a) What are arrays ? Define two-dimensional arrays by giving examples. (2)

(b) Write a C/C++ program to multiply two 3×3 matrices. (8)

11. (a) Define a function. What types of values can be returned by a function ? Explain by giving examples. (3)

(b) Write a C/C++ program with a function to check if a number is a prime number. (7)