Fourth Semester B.Sc. Degree Examination, April/May 2019

(CBCS Scheme)

Electronics

Paper IV — MICROPROCESSOR AND C PROGRAMMING

Time : 3 Hours]   *[Max. Marks : 90*

Instructions to Candidates : Answers any **TEN** *questions from Part – A, any* **FIVE** *from Part – B, any* **FIVE** *from Part – C and any* **FIVE** *from Part – D.*

PART – A

Answer any **TEN** questions.   **(10 × 1 = 10)**

1. What is volatile memory?

2. What is a stack?

3. Write the function of program counter.

4. What is a flag?

5. Define OPcode.

6. What is an addressing mode?

7. What is the function of scanf( )?

8. What is a variable in C?

9. Write the format of if statement.

10. How many bytes are used for int data type?

11. What is an array?

12. How is the following executed?

test-condition? Expression 1 : Expression 2.

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Answer any **FIVE** questions. **(5 × 8 = 40)**

13. (a) Explain the types of memories used in computer.

    (b) Explain the flags of 8085 μp. **(4 + 4)**

14. Draw the internal architecture of 8085 μp, and explain briefly. **(8)**

15. (a) Write the addressing modes of the following instructions.

    (i) MOV A, M

    (ii) ADI 8 -bit

    (iii) LDA 9600 H

    (iv) CMA

    (b) Write the instruction format of the following instructions.

    (i) ADD B

    (ii) LXI H, 9800 H

    (iii) NOP

    (iv) LDAX D **(4 + 4)**

16. (a) What is a subroutine? Explain the use of stack when executing a subroutine.

    (b) Draw the timing diagram of memory read operation and explain. **(4 + 4)**

17. (a) Explain the importance of inclusion, define, global variable and local variable declarations with example.

    (b) Explain various data types used in C. **(4 + 4)**

18. (a) Explain arithmetic, and shorthand arithmetic assignment operators with examples.

    (b) Explain relational, increment/decrement operators with examples. **(4 + 4)**

19. (a) Explain if-else statement with an example and flow chart.

    (b) Compare while and do-while loops with example. **(4 + 4)**

20. (a) Explain the need for an array and show how will you declare and initialise single dimensional array.

    (b) Explain the use of functions in C. **(4 + 4)**

PART – C

Answer any **FIVE** questions.   (5 × 6 = 30)

21. Using NAND gate decoder, find the range of address to interface the following memory chips to μp-8085.

    (a) RAM – 4 KB with starting address 3000 H

    (b) PROM – 16 KB with starting address 2000 H.

22. Calculate the delay produced by the following program, if the clock frequency is 3 MHz.

Mnemonics	T – States
LXI D, A629H	10
loop : DCX D	6
NOP	4
NOP	4
MOV A,D	4
ORA E	4
JNZ loop	10/7
RET	10

23. Write an ALP to add two 16-bit numbers. One number is available at 9600 H and 9601 H and another number is available at 9700 H and 9701 H. Store the result at the memory locations whose starting address is 9800 H.

24. Write an ALP to arrange 8 numbers in ascending order.

25. Write a C program to find the largest of 'n' numbers.

26. Write a C program to find the factorial of a number.

27. Write a C program to generate Fibonacci series.

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Answer any **FIVE** questions.   **(5 × 2 = 10)**

28. Write operation performed by the μp-8085, when,

    (a) $IO/\overline{M} = 0$, $S_0 = 1$, $S_1 = 1$

    (b) $IO/\overline{M} = 0$, $S_0 = 0$, $S_1 = 1$

29. Write the flag status when the following instructions are executed. Assume $A = F6H$

    (a) XRA   A

    (b) CMP   A

30. Write the contents of reg. A and C, and also flags after execution of the following program.

    ```
    MVI A, 69 H
    RRC
    MVI C, 8 H
    ANA C
    HLT
    ```

31. Differentiate between maskable and non-maskable interrupts with an example.

32. How many times the following loop is executed?

    ```
    RL = 100;
    while (RL < = 1000)
    {
    printf("%d", RL);
    RL = RL + 100;
    }
    ```

33. Evaluate the following expression

    result $= 7 * 4 / 12 + 12 - 9 \% 2$

34. The average percentage of marks scored by the student is accepted as input and the result is displayed. Write the C program for the following :

    when percentage is 60 and above display "First Class"

    when percentage is 50 and above, display "Second Class"

    when percentage is 35 and above, display "Pass Class"

    when percentage is less than 35, display "No problem, Try next time".