1196

Code : 15EC42T

Register Number | | | | | | | |

IV Semester Diploma Examination, Nov./Dec. 2017

MICROCONTROLLERS AND APPLICATIONS

Time : 3 Hours] **[Max. Marks : 100**

Note : (i) Answer any **six** questions from **Part-A**.
(ii) Answer any **seven** questions from **Part-B**.

PART-A

1. Compare the features of RISC & CISC processors. **5**

2. List, with syntax and function, any five instructions from both arithmetic and bit addressable instructions groups. **5**

3. Write an 8051 assembly language program to count number of binary ones in a byte of internal data memory. **5**

4. Tabulate basic data types, their size and range of values supported in embedded C. **5**

5. Differentiate between interrupt and polling methods. **5**

6. State the roles of TMOD, TCON, SCON, SBUF in 8051 serial programming. **5**

7. Illustrate the generation of delay using timer. **5**

8. Show the interfacing of single-digit seven-segment display with, 8051 and write appropriate code to display 6 in it. **5**

9. Sketch the schematic for interfacing DC motor to 8051. **5**

PART-B

10. (a) Sketch the structure of PSW and write functions of various flags. **5**
    (b) Explain the organization of internal RAM memory in 8051. **5**

11. (a) List at least five architectural features of 8051. **5**
    (b) Explain the function of the following pins : **5**
    (i) ALE
    (ii) $\overline{PSEN}$
    (iii) TO
    (iv) $\overline{INT1}$
    (v) TXD

12. Explain the different addressing modes in 8051 with examples. **10**

13. (a) Write the syntax and function of the following instructions : **5**
    (i) SWAP A
    (ii) DJNZ, R_1, addr
    (iii) ANL A, # data
    (iv) DEC R_3
    (v) DA A
    (b) Write an ALD to transfer a block of data from one portion of internal RAM to another. **5**

14. (a) Write an embedded C program to convert unpacked BCD digits to ASCII code. **5**
    (b) Write an 8051 C program to read $P_{1.2}$ and send it to $P_{2.3}$ after inverting it. **5**

15. (a) Write an 8051 C program to toggle all the bits of P_0 for every 500 ms. **5**
    (b) Mention different logical operators available in 8051 C. **5**

16. Show interfacing of LED and push-button to 8051 and write the program to toggle LED upon every pressing of push-button. **10**

17. (a) Compare the interrupt method and polling method of servicing devices. **5**
    (b) List the interrupts available in 8051 and explain. **5**

18. Write an ALD and 8051 C program to generate a square wave of 10 kHz at $P_{1.2}$. Use timer-1 in mod-2 and crystal frequency of 11.0592 MHz. **10**

19. Write the schematic, algorithm and program to interface a DAC to 8051 to generate a triangular wave form. **10**