C20-EC-502

7641

BOARD DIPLOMA EXAMINATION, (C-20)

DECEMBER—2022

DECE - FIFTH SEMESTER EXAMINATION

MICROCONTROLLERS AND APPLICATIONS

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. List the special functional registers of 8051 that are associated with interrupts.

2. State the need for an instruction set.

3. Classify the 8051 instructions based on their functions.

4. Give the range of instructions SJMP, AJMP and LJMP.

5. Write an ALP to multiply an eight number present in external RAM location 5000H with an eight-bit number present in R_2 register.

6. List any three instruction command codes for programming 16×2 LCD module.

7. Draw the interfacing diagram of an LED with 8051.

8. Classify PIC microcontrollers based on number of bits.

9. State the important features of PIC 16F877.

10. Define embedded system.

PART—B

8×5=40

Instructions : (1) Answer **all** questions.

(2) Each question carries **eight** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. *(a)* Draw the functional block diagram of 8051 and explain about each block.

(OR)

(b) Explain the internal and external memory organization of 8051.

12. *(a)* Draw the pin diagram of 8051 microcontroller and specify the purpose of each pin.

(OR)

(b) Explain the special functional registers TCON and SCON of 8051.

13. *(a)* Explain the different addressing modes of 8051. Give an example for each one of them.

(OR)

(b) Explain the following instructions :

(i) RLC A

(ii) DA A

(iii) MOVC A,@A+DPTR

(iv) JNC rel

14. *(a)* Write an assembly language program to add two eight-number that are stored at external RAM locations 1234H and 5678H. Store the result in R_2 register.

(OR)

(b) Write an assembly language program to subtract an eight-bit number that is stored at external RAM location 3000H, from an eight-number that is stored at external RAM location 2000H. Store the result in R_3 register.

15. *(a)* Write an assembly language program to generate a square wave of 1 kHz frequency from Pl.0 of 8051. Assume clock frequency as 12 MHz.

(OR)

(b) Define the term 'debugging' and explain the principles of single step and break point debugging techniques.

PART—C

10×1=10

Instructions : (1) Answer the following question.

(2) The question carries **ten** marks.

(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

16. Draw the interface diagram to interface a common anode seven-segment display with 8051 and write a program to display decimal number 9.

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