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C20-EC–502

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BOARD DIPLOMA EXAMINATION, (C-20)

OCTOBER/NOVEMBER—2023

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 features of 8051 microcontroller.

2. State the need for an instruction set.

3. Classify the 8051 instruction set based on their function.

4. Differentiate between RET and RETI instructions.

5. Define the term 'debugging a program'.

6. Draw a diagram to connect an LED to a port pin of 8051.

7. List the reasons for the popularity of LCD display.

8. Classify PIC microcontroller based on number of bits.

9. List the important features of ARM7.

10. List any five applications of 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 microcontroller and explain each block.

(OR)

(b) Explain the SFRs associated with timers/counters of 8051.

12. *(a)* Explain the internal memory organization of 8051 with suitable block diagram.

(OR)

(b) Explain the modes of operations of serial communication with 8051.

13. *(a)* Explain various addressing modes of 8051 with an example for each.

(OR)

(b) Explain any four data transfer instructions with an example for each.

14. *(a)* Block of 10 bytes are stored in the external RAM location from 8000H onwards. Write an ALP with comments to transfer these bytes to internal RAM location from 30H onwards.

(OR)

(b) Write an ALP to generate 1 msec time delay by using timer 0, under mode 1 with suitable comments (assume XTAL oscillator frequency 12 MHz).

15. *(a)* Write an ALP to find 2's complement of a number which is stored at 30H of internal RAM and store the result in 31H of internal RAM.

(OR)

(b) Write an ALP to find the sum of 10 bytes of data stored from memory location 40H of i-Ram onwards and store the 16 bit result in location 50H (LSB) and 51H (MSB).

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 16 × 2 LCD model to the port 1 of 8051 and write an ALP to display the text "GOOD" on the LCD module.

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