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A23 – 08078

Reg. No……
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2023

EMBEDDED SYSTEMS

[Maximum Marks: **100**] [Time: **3** Hours]

PART-A

[Maximum Marks: **10**]

I. (Answer ***all*** questions in one or two sentences. Each question carries ***2*** marks)

1. What is the maximum value that can be stored in Atmega32 GPRs?
2. Write examples of any two logical instructions.
3. Give the size in bits of int in AVR C.
4. Name any 2 embedded development boards.
5. Name the 8-bit Timers in ATmega32. (5 x 2 = 10)

PART-B

[Maximum Marks: **30**]

II. (Answer ***any five*** of the following questions. Each question carries ***6*** marks)

1. Draw the bit pattern and name different bits of status register.
2. Write an Assembly language program to read two 8-bit data from SRAM locations 0x60 and 0x61, multiply them store the result in SRAM locations 0x70 abd 0x71.
3. Write I/O registers and their use associated with Timers.
4. Write different features of AVR Micro controller.
5. Write some applications of embedded systems.
6. Explain different data types in AVR C-programming.
7. Explain different data formats with example. (5 x 6 = 30)

PART-C

[Maximum Marks: **60**]

(Answer ***one*** full question from each Unit. Each full question carries **15** marks)

UNIT – I

III. (a) Explain addressing modes of ATmega32 with examples. (9)

(b) Explain the data memory of Atmega32. (6)

OR

IV. (a) Compare SRAM and EEPROM in AVR. (6)

(b) Draw the general architecture of AVR and explain function of each part. (9)

UNIT – II

V. (a) Explain Rotate and Shift instruction with examples. (8)

(b) Compare subroutines and Macros. (7)

OR

VI. (a) Explain the need for initializing stack and give a simple example for that. (7)

(b) What are assembler directives? Write any three with examples to show their use. (8)

UNIT- III

VII. (a) Explain the logical operators use in AVR C with example. (9)

(b) Draw AVR connection to RS-232. (6)

OR

VIII. (a) Which are the common sources of interrupts in ATmega32. (4)

(b) Explain how external interrupts are enabled or disabled in ATmega32. (4)

(c) Write an AVR C program to display 00 to FF on PORT C with a suitable delay. (7)

UNIT - IV

IX. (a) Draw and explain the hardware architecture of an embedded system. (10)

(b) List different features of Embedded system. (5)

OR

X. (a) Explain general architecture of Embedded OS. (9)

(b) Write short notes on:

(i) Task scheduling (ii) Mutual exclusion (6)

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