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Reg.No............................

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, APRIL-2022

EMBEDDED SYSTEMS

[Maximum marks: 100]   (Time: 3 Hours)

PART – A
Maximum marks : 10

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

1. List any two features of AVR family.

2. Give the structure of macro.

3. Which is the highest priority interrupt in ATmega 32?

4. State the role of kernel in embedded OS.

5. Write any two types of embedded OS.   (5 x 2 = 10)

PART – B
Maximum marks : 30

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

1. Give a comparison of various members of AVR family?

2. Write the steps to program the timer interrupts in AVR microcontroller.

3. Write an Assembly language program to multiply two 8 bit numbers and store the
   result in 0x300.

4. List any six applications of Embedded systems with example.

5. Describe the status register of ATmega32.

6. Describe the delay calculation using loop in AVR microcontroller with assembly
   language.

7. Describe 12C with a connection diagram.   (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 the data memory organization of ATmega 32 microcontroler?   (8)

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(b) Give a comparison between the AVR with microcontroller offered by other

   manufacturer. (7)

OR

IV.(a) Describe the different Addressing modes of ATmega 32 microcontroller with examples. (8)

   (b) Describe the general purpose registers of ATmega 32. (7)

UNIT-II

V. (a) Define Assembler directives. Describe the structure of an assembly language program

   with example. (8)

   (b) Write an Assembly Language Program to toggle PB3 bit continuously without

   disturbing other bits of PORTB with some delay. (7)

OR

VI. (a) Explain conditional branching instructions in AVR microcontroller. (8)

   (b) Write an Assembly Language Program to monitor the PB2 bit of PORTB,

   When PB2 becomes high write the data 0x45 to PORTC? (7)

UNIT-III

VII. (a) Explain data types in AVRC? (8)

   (b) Write an AVR C-program to get a data byte from Port B and send it to PORTC

   continuously. (7)

OR

VIII.(a) Explain the steps for programming Timer0 in normal mode. (8)

   (b) Explain the programming of external hardware interrupts in AVR with an example. (7)

UNIT-IV

IX. (a) Explain Hardware architecture of Embedded systems. (8)

   (b) Write any seven characteristic features of Embedded system. (7)

OR

X. (a) Explain architecture of an Embedded Operating system. (8)

   (b) List the categories of Embedded OS with examples. (7)

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