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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2017

EMBEDDED SYSTEMS

[*Time* : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

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

1. What does 32 indicate in the name ATmega32 ?

2. Give examples of any two data transfer instructions.

3. List two data types used in AVR C programs.

4. List any 2 embedded development boards.

5. List the Timers and their sizes in ATmega32.   (5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. Draw and explain status register.

2. Write an Assembly language program to read an 8-bit data from Port B and display it on Port D.

3. Specify I/O registers and their use associated with Interrupts.

4. Mention the different activities of embedded OS.

5. List some applications of embedded systems.

6. Differentiate between BRCC and BRCS instructions with simple examples.

7. Compare SRAM and EEPROM of ATmega32.   (5×6 = 30)

Marks

PART — C

(Maximum marks : 60)

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

UNIT — I

III   Explain addressing modes of ATmega32 with examples.   15

OR

IV   (a)   Explain different types of memories used inside AVR.   6

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

UNIT — II

V   (a)   Explain logical instructions with examples.   8

    (b)   Explain the different steps to create and execute an assembly language program. Name the different files generated and their purpose.   7

OR

VI   (a)   Write an assembly language program to multiply two 8-bit numbers stored in SRAM locations 0×80 and 0×81, store the result in 0×82 and 0×83.   7

    (b)   What are assembler directives ? Write any three assembler directives with examples.   8

UNIT — III

VII   (a)   Explain different I/O registers associated with timers and mention their use with examples.   9

    (b)   Write an AVR C- program to convert packed BCD number 0×45 to corresponding ASCII codes and display on PORT D and PORT C.   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 B with a suitable delay.   7

UNIT — IV

IX   (a)   Explain the hardware architecture of an embedded system.   8

    (b)   Explain different categories of embedded OS.   7

OR

X   (a)   Explain the general architecture of Embedded OS.   10

    (b)   List the characteristic features of embedded system.   5

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