N19 - 00558

TED (15) – 5041

(REVISION — 2015)

Reg. No.....

Signature .....

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2019

EMBEDDED SYSTEM

[*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. How many general purpose registers are there in ATmega32 ?
2. Give any two assembler directives in AVR assembly language program.
3. Name two I/O registers associated with timers and give its size in bits.
4. Define an embedded system.
5. State the role of kernel in Embedded OS. (5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. Describe the various members of AVR family.
2. Describe instruction pipeline.
3. Write an Assembly language program to add two bytes of data from the memory address of 0×300 and 0×301, store the result in 0×302.
4. Describe the logic operators in embedded C.
5. Describe the Arduino development board.
6. Write any six application area of embedded systems.
7. Describe the data memory 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 (a) Draw and explain the simplified architecture of ATmega32. 9

(b) Describe the general purpose registers of ATmega32. 6

OR

IV (a) Briefly describe the Addressing modes ATmega32 microcontroller. 8

(b) Describe the status register of ATmega32. 7

UNIT — II

V (a) Describe data transfer and arithmetic instructions with example. 8

(b) Write an Assembly Language Program to toggle the bits of PORTB Continuously by writing 0×55 & 0×AA with some delay. 7

OR

VI (a) Describe rotate and shift instructions with example. 8

(b) Write an Assembly Language Program to convert the BCD number 0×65 to ASCII code and place the result in R21 and R22. 7

UNIT — III

VII (a) Describe the data types and time delays in embedded C. 8

(b) Write an AVRC program to send values 0×00 to 0×FF to PORT B with 500ms delay. 7

OR

VIII (a) Draw the structure of TIMER0 and write the steps to program the TIMER0 in normal mode ? 9

(b) Explain the ATmega32 connection to RS232 with diagram. 6

UNIT — IV

IX (a) Explain Specialties of embedded system. 8

(b) List the features of embedded system. 7

OR

X (a) Describe the architecture of embedded operating system. 9

(b) Define (i) Task (ii) Task scheduling (iii) Context switching. 6

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