TED (15) – 5041

(REVISION — 2015)

Reg. No.....

Signature .....

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

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. List any 2 members of ATmega family.
2. List any two assembler directives.
3. Specify is the size in bits of 'unsigned char' type data.
4. Define an embedded system.
5. Give the function of SWAP instruction. (5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. List the features of AVR microcontroller.
2. Explain different data formats used in AVR with example.
3. Draw and explain the connection of RS232 to ATmega32.
4. Explain different types of embedded OS.
5. Compare Subroutines with Macros.
6. List some applications of embedded systems.
7. Explain different data types in AVR C-programming. (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 Draw and explain architecture of ATmega32. 15

OR

IV (a) Draw the bit pattern and explain each bit of Status Register. 8

(b) Explain data memory of ATmega32. 7

UNIT — II

V (a) Write an Assembly Language Program to add 45A7H and 3C9AH and store the result in SRAM location 0x 60 and 0x 61. 6

(b) Explain the need for initializing stack with a simple example. 5

(c) Differentiate between LDI and LDS instructions with example. 4

OR

VI (a) Write an assembly language program to convert the BCD number 89H into ASCII and store the result in R20 and R21. 7

(b) Explain any four arithmetic instructions with example. 8

UNIT — III

VII (a) Explain Timer 0 operation with a diagram. 9

(b) Write an AVR C - program to toggle all pins of Port B with some delay. 6

OR

VIII (a) Explain different steps in executing an interrupt in ATmega32. 6

(b) Explain the logical operators used in AVR C with examples. 9

UNIT — IV

IX (a) Explain specialities of Embedded systems. 7

(b) Write short notes on: (i) Task Scheduling (ii) Mutual exclusion. 8

OR

X (a) Explain different activities of an Embedded OS. 9

(b) State role of Kernel in Embedded OS. 6