

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2018

**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 two ATmega 8bit microcontrollers.
2. Mention the size of GPRS and I/O memory(SFR) in ATmega32.
3. List any two AVR data transfer instructions with format.
4. List any two data types in AVR C.
5. Mention any two application areas of embedded system.

(5 × 2 = 10)

**PART — B**

(Maximum marks : 30)

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

1. Explain general purpose registers of ATmega32 microcontroller.
2. Explain the features of AVR family.
3. Name different AVR arithmetic and logic instructions with formats.
4. Explain I/O port programming in AVR.
5. Explain AVR timer-o programming.
6. Explain AVR serial communication.
7. Explain different embedded OS.

(5 × 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 ATmega32 microcontroller with block diagram. 8  
 (b) Explain ATmega32 data memory with a suitable diagram. 7

OR

- IV (a) Explain different addressing modes of ATmega32 microcontroller. 8  
 (b) Explain ATmega32 status registers with bit format. 7

## UNIT — II

- V (a) A switch is connected to pin PA0 and an LED connected to pin PA7, write an AVR assembly program to get the switch status and send it to LED. 8  
 (b) Explain different branching and looping instructions in AVR. 7

OR

- VI (a) A door sensor is connected to PB3 and a buzzer is connected to port PC5. Write an assembly program to turn on buzzer when sensor out put is high. 8  
 (b) Explain macros and subroutines. 7

## UNIT — III

- VII (a) Explain ATmega32 connection to RS232. 8  
 (b) Explain AVR interrupts and its priority. 7

OR

- VIII (a) Explain different logic operators in AVR C. 8  
 (b) Write an AVR C program to turn ON/OFF an LED connected to port B with a delay of 2 milli second each. 7

## UNIT — IV

- IX (a) Explain the architecture of an embedded system with a diagram. 8  
 (b) Explain arduino development board. 7

OR

- X (a) Write the application areas and specialities of an embedded system. 8  
 (b) Explain raspberry pie development board. 7
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