TED (15/19) 6132
(Revision-2015/19)

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, NOVEMBER - 2024

MICROCONTROLLERS

[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. Write any two differences between microprocessor and microcontroller.
2. List any four data types in AVR C.
3. Name the registers associated with a PORT of AVR.
4. List the different timers of ATMega32.
5. Write any two advantages of serial communication. **(5 x 2 = 10)**

PART – B
Maximum marks: 30

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

1. Explain about the general purpose registers with diagram.
2. List the different AVR family of microcontrollers and describe each.
3. Write an AVR C program to monitor bit 5 of PORT C. If it is high, send 55H to PORTB otherwise send AA to PORTA.
4. Describe about Timer 2 of ATMega32 with diagram.
5. Compare and contrast interrupt and polling.
6. Explain the format of ADCSRA.
7. Describe about ATMega32 connection to RS232. **(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 status register of AVR with diagram. (9)

(b) Describe LDI, LDS & IN instructions with examples. (6)

OR

IV. (a) Explain Harvard architecture in AVR with diagram. (9)

(b) List and explain the various unconditional branch instructions in AVR. (6)

UNIT – II

V. (a) Write an AVR C program to send the value 0x45 serially one bit at a time via PORTD pin 3; MSB should go out first. (9)

(b) Describe the different data types used in AVR C. (6)

OR

VI. (a) Explain the different ways of creating time delays in AVR C with examples. (9)

(b) Write short note on data serialization. (6)

UNIT - III

VII. (a) Differentiate between normal mode and compare match mode operations of timers. (9)

(b) Describe about interrupts in AVR. (6)

OR

VIII. (a) Explain Timer 1 in detail with all its registers. (9)

(b) Describe the format of TIFR register. (6)

UNIT – IV

IX. Explain with diagram the interfacing of a 4x4 matrix keypad with AVR. (15)

OR

X. (a) Write the use of DAC and explain its interfacing with an AVR with diagram. (9)

(b) Explain with diagram the interfacing of a temperature sensor with AVR. (6)
