Nov.-Dec. 2010
T.E - Electrical
SEM - I

(1)

[3863] – 362

T.E. (Electrical Engineering) (Semester – I) Examination, 2010
(2008 Course)
MICRO CONTROLLER AND ITS APPLICATIONS [New]

Time : 3 Hours Max. Marks : 100

Instructions : *1) Answer **3** questions from Section **I** and **3** questions from Section **II.***
*2) Answers to the **two** Sections should be written in **separate** books.*
*3) **Neat** diagrams must be drawn **wherever** necessary.*
*4) Black figures to the **right** indicate **full** marks.*
*5) Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is **allowed.***
*6) Assume suitable data, if **necessary.***

SECTION – I

1. a) With a neat diagram explain the internal RAM organization of 8051. **8**
   b) Describe the various flags in 8051. **6**
   c) Explain the functions following pins **4**

      i) T0 (P3.4) ii) $\overline{\text{PSEN}}$.

      OR

2. a) Explain the use of following registers **8**

      i) DPTR ii) Register B iii) Program Counter iv) Accumulator

   b) Compare microcontrollers and microprocessors. **6**
   c) Why ports P0 and P2 are unavailable for I/O operation when external memory is interfaced? **4**
3. a) Explain the various addressing modes of 8051 and give one example of each addressing mode. **6**
   b) Write a program to square the contents of R5, Place the result in R0 & R1. Store the Most significant byte of the result in R1. **6**
   c) Write a program to complement the contents of accumulator if P1.5=1. **4**

      OR

P.T.O.

4. a) Write a program to copy an array of 16 elements from a location 30H onwards to 50H onwards. **6**

   b) Explain the stack organization of 8051 and the instructions associated with the stack. **6**

   c) Write an assembly language program for 8051 to select register bank 3. **4**

5. a) Explain in detail the interrupt structure in 8051. **6**

   b) Explain the Serial Peripheral Interface (SPI) protocol. **4**

   c) Write a program to transfer a letter 'T' Serially 10 times at a baud rate of 4800. Use serial port in Mode 1. **6**

OR

6. a) Write a program to generate a square waveform of frequency 2KHz on pin P2.2. Assume the crystal frequency of 11.0592 MHz. **6**

   b) Write a short note on 12C Bus. **4**

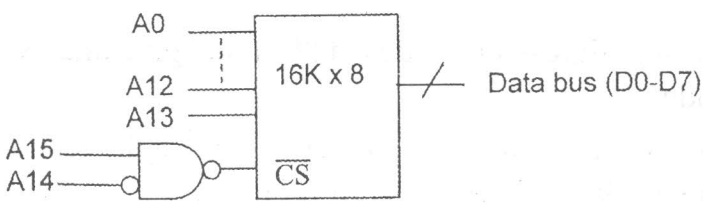
   c) For Mode 1 of serial data communication, show the calculations for finding out the value which is to be loaded in TH1to achieve a baud rate of 9600. Assume the crystal frequency =11.0592 MHz. **6**

SECTION – II

7. a) Draw a diagram showing interfacing of 8255 with 8051 such that following address are realized Port A - C000H, Port B - C001H, Port C - C002H & Control word register C003H. Use full address decoding. **6**

   b) Explain 8051 based Assember, Compiler and Simulator **6**

   c) Find the address range of a memory design shown in the diagram below **4**



OR

8. a) 32KB of EPROM (Program memory) and 32 KB of data RAM is to be interfaced with 8051 draw the interfacing diagram. Use full address decoding. The starting address of EPROM is 0000H. **6**

   b) Write a short note on how 8051 can be interfaced with a PC. **6**

   c) Write a short note on features of 8255. **4**

9. a) Two stepper motors are interfaced to 8051 through a driver card. The motors are controlled through port 1. The step angle of the motor is 1.8 degree. Draw a schematic diagram and write a program to run both the motors in anticlockwise direction through an angle of 180 degree. **10**

   b) Write a short note on temperature measurement using 8051. **8**

OR

10. a) Draw a typical interface of an 8 bit ADC with 8051. Write a program read 100 values from ADC and store them from memory location D100H onwards in external Data Ram. **10**

    b) Write a short note on pressure measurement using 8051. **8**

11. a) Explain frequency measurement using 8051 **8**

    b) Write a short note on 8051 based DC motor control. **8**

OR

12. a) Explain how a 4×4 matrix keyboard can be interfaced with 8051. **8**

    b) Write a short note on 8051 based AC motor control . **8**
