AU – 2868

Seventh Semester B. E. (Electronics and Tele.) Examination

MICROCONTROLLER AND APPLICATIONS

Paper – 7 XT 2 / 7 XN 2

(USC – 10628)

P. Pages : 3

Time : Three Hours] [Max. Marks : 80

Note : (1) Separate answer book must be used for each section in the subject Geology, Engineering material of civil branch and Separate answer book must be used for Section A and B in Pharmacy and Cosmetic Tech.

(2) Due credit will be given to neatness and adequate dimensions.

(3) Assume suitable data wherever necessary.

(4) Illustrate your answer wherever necessary with the help of neat sketches.

(5) Use pen of Blue / Black ink / refill only for writing the answer book.

SECTION A

1. (a) Explain internal memory structure of 8051 microcontroller. Discuss how the register banks are selected with suitable example. 7

   (b) Give the characteristics of RS232 bus standard. What are the limitations of RS232 bus std ? 6

OR

2. (a) State the difference between control and conditional flags. Explain the flag register of 8051 microcontroller. 7

   (b) Draw the timer structure of 8051. Explain its operation. 6

3. (a) Write an ALP for 8051 to get the x value from port P2 and send x^2 to port P1 continuously. The value of x consider from 0 to 9. Use lookup table for x^2. 6

(b) Interface PPI 8255 with 8051 such that the address of CWR is 7FH. Write an ALP to get the data from port B and send it to port A of 8255. 8

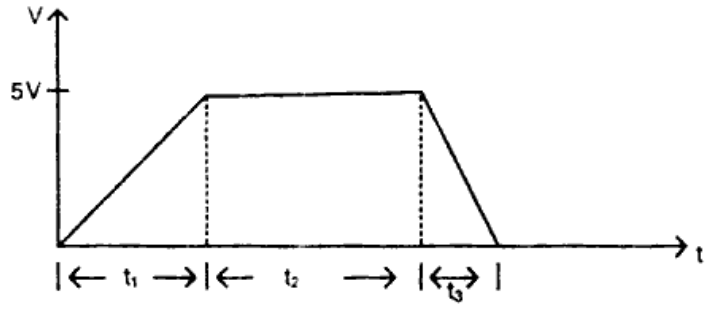
OR

4. (a) Explain various types of jump instructions according to range. 7

(b) Write an assembly language program for 8051 to transfer 20 bytes of data from internal RAM 30H to external memory 4500H. 7

5. (a) Interface ADC0809 with 8051. Write an ALP to read an analog voltage from CH-3 and convert it into digital and store the digital value in memory 3000H. 7

(b) Interface DAC0800 with 8051 and write an assembly language program to obtained the following waveform.



6

OR

6. Design 8051 based system for measurement of temperature. Draw the interfacing diagram, flow chart and write assembly language program for it. 13

SECTION B

7. (a) Draw interfacing diagram of stepper motor with 8051. Write an ALP to rotate a stepper motor by 64^0 clockwise direction. Assume the motor has a step angle of 2^0. Use the 4 step sequence. 7

(b) Interface LCD with 8051 and write an ALP to display the message "MCA" at line 1, column 5. 7

OR

8. Two switches SW0 and SW1 are connected to pin P2.0 and P2.1 respectively. Write an ALP to monitor the status of switches and perform the following with diagram of interfacing :—

   (i) If SW0 is pressed, the stepper motor moves clockwise.

   (ii) If SW1 is pressed, the stepper motor moves anticlockwise.

   (iii) If both switches are pressed simultaneously, motor stops. 14

9. (a) State and explain serial modes of 8051. How baud rate is set ? Show calculations for setting baud rate of 2400. 7

   (b) Discuss the address map of the RTC DS12887. 6

OR

10. (a) Write an ALP for 8051 to receive bytes serially with baud rate 9600, 8 bit data and 1 stop bit, simultaneously, send received bytes to the port 2. XTAL = 11·0592 MHz. 7

   (b) Explain the function of the following pins of the RTC DS12887 :—

   (i) AS.

   (ii) MOT.

   (iii) DS.

   (iv) SQW. 6

11. (a) Explain data types used in C programming for 8051. Also define range for each data type. 6

   (b) Write a 8051 C program to toggle all bits of P1 and P2 continuously with a 200 ms delay. 7

OR

12. (a) Write an 8051 C program to turn bit P1·5 on and off 50,000 times. 6

   (b) Write an 8051 C program to convert packed BCD 0x29 to ASCII and display the bytes on P1 and P2. 7