CBCS SCHEME

Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Microcontroller

Time: 3 hrs.   Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. With a neat block diagram, explain the peripherals of 8051 microcontroller. **(10 Marks)**
   b. Along with neat block diagram, explain the RAM and ROM architecture. **(06 Marks)**

OR

2 a. Give the differences between:
     i)   Harvard and von-neuman memory architecture
     ii)   RISC and CISC. **(08 Marks)**
   b. Draw the memory interfacing circuit to connect 8051 to 8K external ROM along with the timing diagram. **(06 Marks)**
   c. Explain the function of i) $\overline{PSEN}$ ii) ALE pins. **(02 Marks)**

Module-2

3 a. Define addressing mode. Explain different addressing modes of 8051 along with instruction format and an example for each. **(08 Marks)**
   b. Write an ALP to divide the data in RAM 20H by data in RAM 21h. Store the result in 20h and 21h. Now restore original data into 20h and 21h. **(05 Marks)**
   c. Explain briefly the following instruction:
     i)   Push src address
     ii)   Pop dst address
     iii)   DA A. **(03 Marks)**

OR

4 a. Explain the following assembly instruction:
     i)   CJNE op1, op2, addr
     ii)   J2 addr
     iii)   DJN2 op1, addr
     iv)   JNB b, addr. **(08 Marks)**
   b. Explain the significance of stack memory when a CALL is made to the subroutine. **(06 Marks)**
   c. Differentiate between:
     i)   Jump and call
     ii)   RET and RETI. **(02 Marks)**

Module-3

5 a. List the advantages of programming in 'C' over assembly language. **(05 Marks)**
   b. Write a C program to convert a hexadecimal number FDh to ASCII numbers after converting it to BCD. **(05 Marks)**
   c. Explain the different C data types of 8051 along with an example and mention the 2 methods of generating a delay. **(06 Marks)**

OR

6   a.   Write an ALP and C program to generate a pulse train of 50ms on P2.3. Use timer 0 in mode 0 with a crystal frequency of 22 Mhz.   **(08 Marks)**

   b.   With a neat block diagram, explain the working of timer in mode 2. Write the procedure for generating time delay in mode 2.   **(08 Marks)**

Module-4

7   a.   Explain the significance of TI and RI flag in SCON.   **(08 Marks)**

   b.   Consider a switch SW is connected to pin P2.3 monitor the SW status and if SW = 0, send "hello" and if SW = 1, send "world" serially. Write a C program, assume XTAL = 11.0592 MHz, Band rate of 9600, 8 bit data, 1 stop bit.   **(08 Marks)**

OR

8   a.   Explain the following SFR's: i) IE   ii) IP.   **(08 Marks)**

   b.   Write C program to generate a square wave of 10 kHz with timer 0 in mode 2 at port pin 1.3 using interrupt mode and also display a value of 'A' at P2 and 'B' at P0. XTAL = 22MHz.   **(08 Marks)**

Module-5

9   a.   Write a C program to display message "VTU" on LCD continuously. Show the interfacing diagram of 8051 to LCD along with pin details of LCD.   **(10 Marks)**

   b.   Interface 8051 with stepper to rotate motor in anti clock wise direction. Write neat interfacing circuit diagram.   **(06 Marks)**

OR

10   a.   Write an ALP to detect the key pressed connected at pin P3.2 and send the data '0' to the serial port 1.   **(08 Marks)**

   b.   With a neat block schematic of DAC 0808 interfaced to 8051 at port P0, write a C program to generate sine wave.   **(08 Marks)**

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