C.U.SHAH UNIVERSITY
Winter Examination-2015

Subject Name: Microcontrollers & Its Applications

Subject Code: 4TE05MCA1   **Branch:** B.Tech (EC)

Semester: 5   **Date:** 02/12/2015   **Time:**2:30 **To** 5:30   **Marks:** 70
Instructions:
  (1) Use of Programmable calculator & any other electronic instrument is prohibited.
  (2) Instructions written on main answer book are strictly to be obeyed.
  (3) Draw neat diagrams and figures (if necessary) at the right places.
  (4) Assume suitable data if needed.

Q-1   **Attempt the following questions**   **(14)**
  a) 8051 series of micro controllers are made by which of the following companies?
        1) Atmel   2) Philips   3) none   4) 1 and 2
  b) The 8051 series has how many 16 bit registers?
        1) 2   2) 3   3) 1   4) 0
  c) When the micro controller executes some arithmetic operations, then the flag bits
        of which register is affected?
        1) PSW   2) SP   3) DPTR   4) PC
  d) Which port has no dual functions?
        1) P3   2) P1   3) P2   4) P0
  e) Which pointer registers are used for internal data move operation?
        1) R0   2) R1   3) R0 and R1   4) R0, R1 and DPTR
  f) Which pointer registers are used for external data move operation?
        1) R0   2) R1   3) R0 and R1   4) R0, R1 and DPTR
  g) On power up, the 8051 uses which RAM locations for register R0- R7
        1) 00H-2FH   2) 00H-07H   3) 00H-7FH   4) 00H-0FH
  h) How many bytes of bit addressable memory is present in 8051 based micro-
        controllers?
        1) 8 bytes   2) 32 bytes   3) 16 bytes   4) 128 bytes
  i) If we push data onto the stack, then the stack pointer register SP
        1) increases with every push   2) decreases with every push
        3) none   4) 1 and 2
  j) Which instruction is used for exchange of lower nibbles of bytes?
        1) XCH   2) XCHD   3) SWAP   4) none
  k) Which instruction is used for external RAM data move operation?
        1) MOV   2) MOVC   3) MOVX   4) none
  l) After reset, SP register is initialized to _____ address
        1) 00H   2) 08H   3) 07H   4) none
  m) Which registers are bit as well as byte addressable?
        1) SP   2) A   3) SBUF   4) all mentioned

n) Which pin of the 8051 microcontroller connected to RD' pin of external ROM?
   1) EA'   2) PSEN'   3) ALE   4) none

Attempt any four questions from Q-2 to Q-8

Q-2	**Attempt all questions**	**(14)**
a)	Explain in detail internal architecture of 8051 microcontroller with diagram.	**08**
b)	Draw and explain the internal RAM organization of the 8051 microcontroller.	**06**

Q-3	**Attempt all questions**	**(14)**
a)	What are the addressing modes of 8051 microcontroller? Explain each with examples.	**07**
b)	Explain Relative range, short absolute range and long absolute range with necessary instructions.	**07**

Q-4	**Attempt all questions**	**(14)**
a)	Draw the timer/counter logic circuit for 8051 microcontroller. Explain timer mode 1 and 2 in detail with diagram. Write an assembly language program to generate a square wave of 50Hz on port pin P1.2 using timer o in mode 1. Assume that XTAL = 12 MHz	**10**
b)	Draw and explain port 2 configuration.	**04**

Q-5	**Attempt all questions**	**(14)**
a)	Draw the power on reset circuit with and without push button switch for 8051 microcontollor.	**04**
b)	Explain in detail PSW, TMOD and TCON SFRs with diagrams.	**10**
Q-6	Explain in detail SFRs IE and IP in detail with diagram. Write an assembly language program using interrupts to do the following 1) Receive data serially and send it to port P0 2) Read port P1 copy it to port P0 and also transmitted serially 3) Make timer 0 to generate a square wave of 5KHz on port pin P0.1 Assume that XTAL = 11.0592MHz, baud rate of 4800, 8-bit data, 1 stop bit	**(14)**

Q-7	Explain in detail SCON and PCON in detail with diagram. Write an 8051 C program to monitor the switch connected to the port pin P2.0 and perform the following 1) If SW=0 send the message "normal speed" to the serial port 2) If SW=1 send the message " high speed" to the serial port.	**(14)**

Q-8	**Attempt all questions**	**(14)**
a)	Draw the interfacing diagram of 16X2 LCD with 8051 microcontroller. Write an assembly language program for display INDIA message on LCD.	**07**
b)	Draw the interfacing diagram of DAC 808 wiyh 8051 microcontroller. Write an assembly language program for generating sine wave.	**07**