Sample Test Paper-I

Course Name : Electronics Engineering Group

Course Code : ET/EN/EX/EJ/IE/IS/IC/DE/EV/MU

Semester   : Fifth

17534

Subject Title : Microcontroller

Marks   : 25   **Time : 01 Hour**

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Instructions:
1. All questions are compulsory.
2. Illustrate your answer with neat sketches wherever necessary
3. Figure to the right indicates full marks
4. Preferably write the answer in sequential order.
5. Any electronic media not allowed

Q1) Attempt any three: **9 Marks**
   a) Differentiate between Microprocessor and Microcontroller (any three points).
   b) Describe the function of address, data and control bus.
   c) Draw the block diagram of Harvard and Von Neumann architectures.
   d) Draw the format of PSW register of 8051 microcontroller and state the conditions when flags available in PSW are set to 1.
   e) Describe the following instructions of 8051 microcontroller.
      (i)   SWAP A   (ii)   DIV AB   (iii)   RLA

Q2) Attempt any two: **8 Marks**

   a) List any four important features of 8051 microcontroller.
   b) Draw the architecture of 8051 microcontroller.
   c) Describe power saving operation of 8051 microcontroller.

Q3) Attempt any two: **8 Marks**
   a) List the four addressing modes of 8051 microcontroller with one suitable instruction each.
   b) Write an assembly language program for 8051 microcontroller to add two bit numbers stored in internal RAM. Store the result in internal RAM.
   c) Describe the function of Editor, Assembler, linker and compiler.

Sample Test Paper-II

Course Name : Electronics Engineering Group

Course Code : ET/EN/EX/EJ/IE/IS/IC/DE/EV/MU

17534

Semester   : Fifth

Subject Title : Microcontroller

Marks   : 25   **Time : 01 Hour**

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Instructions:

1) All questions are compulsory.
2) Illustrate your answer with neat sketches wherever necessary
3) Figure to the right indicates full marks
4) Preferably write the answer in sequential order.
5) Any electronic media not allowed

Q1) Attempt any three: **9 Marks**

   a) List the alternative functions of port 3 of 8051 microcontroller
   b) Draw the format of TCON register and describe the function of each bit.
   c) List the operating mode of 8255. Describe their features.
   d) Describe the different modes of serial communication.
   e) Draw the interfacing diagram 4x4 keyboard with 8051 microcontroller.

Q2) Attempt any two: **8 Marks**

   a) Describe the timer and counter mode of 8051 microcontroller
   b) Write an assembly language program using 8051 to transmit "MSBTE" from Txd pin
      Contineously with Board rate of 9600. The crystal frequency is 11.0592 MHz.
   c) Write an assembly language program to generate continuous square wave of 2KHz on P1.4
      using mode 2 of timer 0. The crystal frequency is 11.0592MHz.

Q3) Attempt any two: **8 Marks**
   a) Interface 2K byte of EPROM and 2Kbyte of RAM to 8051 microcontroller.
   b) Draw the interfacing diagram of seven segment display to 8051 microcontroller.
   c) Write an assembly language program using 8051 microcontroller to rotate stepper motor
      clockwise continuously.

Sample Question Paper

Course Name : Electronics Engineering Group

Course Code : ET/EN/EX/EJ/IE/IS/IC/DE/EV/MU

17534

Semester : Fifth

Subject Title : Microcontroller

Marks : 100   **Time: 3 Hours**

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Instructions:
1) All questions are compulsory.
2) Illustrate your answer with neat sketches wherever necessary
3) Figure to the right indicates full marks
4) Preferably write the answer in sequential order.
5) Any electronic media not allowed

Q1.A) Attempt any Three.   **12 Marks**

a) Distinguish between Microprocessor and Microcontroller (any four).

b) Draw the block diagram of Harvard and Von-Neumann architecture.

c) List any four important features of 8051 microcontroller.

d) Describe any four addressing modes of 8051 microcontroller with one example each.

e) Draw Block diagram of 8255. Discuss the operating modes of it.

Q1. B) Attempt any One.   **06 Marks**

a) Write an assembly language program for 8051 microcontroller to transfer ten bytes of data from source to destination in internal RAM (Assume suitable memory addresses)

b) Draw interfacing diagram of 2Kbyte EPROM and 2K byte RAM to 8051 microcontroller. Draw the memory map.

Q2. Attempt any Four.   **16 Marks**

a) Draw the internal architecture of 8051 microcontroller.

b) Draw the format of PSW register of 8051 microcontroller and state the function of each flag.

c) Describe the function of following pins of 8051 microcontroller

(i) $\overline{PSEN}$ (ii) ALE (iii) $\overline{EA}$ (iv) RST

d) Draw the internal RAM memory organization of 8051 microcontroller

e) Describe the power saving operation of 8051 microcontroller.

f) Describe the function of address, data and control bus.

Q3. Attempt any Four.   **16 Marks**

    a) Describe the function of following instructions of 8051 microcontroller

          (i)   SWAP A   (ii)   DIV AB   (iii) MUL AB (iv) RLA

    b) Describe the following directives with one example.

          (i)   ORG (ii)   DB   (iii)   EQU   (iv) END

    c) State the function of editor, assembler, linker and compiler.

    d) Write an assembly language program for 8051 microcontroller to add two 8 bit numbers 55H and 67H . Store the result at 20H.

    e) List all the alternate functions of port 3 of 8051 microcontroller.

Q4. A) Attempt any Three.   **12 Marks**

    a) Describe following 8051 microcontroller instructions

          (i)   SET B C   (ii)   ADD A, @R0

          (iii)   MOV A, #20H   (iv)   XCH A, R0

    b) Draw the format of SCON register and describe the function of each bit.

    c) Draw the circuit diagram of port 2 and describe its functions.

    d) With crystal frequency = 11.0592 MHz, what value should be loaded into TH1 to have 9600 baud rate? Give the answer in both decimal and hex.

Q4.B) Attempt any One.   **06 Marks**

    a) Write an assembly language program for 8051 microcontroller to multiply two 8 bit numbers stored at 10H and 11H in internal RAM. Store result at 12H and 13H.

    b) Draw the interfacing diagram of stepper motor with 8051 microcontroller and write an assembly language program to rotate stepper motor continuously in clock wise direction.

    c) Draw the interfacing diagram of relay with 8051 microcontroller & write an assembly language program to turn ON & OFF relay.

Q.5 Attempt any Four.   **16 Marks**

    a) Draw the format of TCON register and state the function of each bit.

    b) Describe the timer modes of 8051 microcontroller.

    c) List the various interrupts in 8051 microcontroller along with their priorities and vector locations.

    d) Write an assembly language program for 8051 microcontroller to generate square wave on P1.0 using delay subroutine.

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e) Draw the internal structure of port3 & list alternate functions of part3.

Q6. Attempt any Four.   **16 Marks**

   a) Write an assembly language program to generate continuous square of 2KHz frequency on P1.4 using timer 0. Assume crystal frequency of 8051 microcontroller is 11.0592 MHz.

   b) Draw and describe IE register of 8051 microcontroller.

   c) Draw the control word register format of 8255 and describe the function of each bit.

   d) Draw and describe IP register format of 8051 microcontroller.

   e) Discuss the selection factors of microcontroller.