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PRESIDENCY UNIVERSITY
BENGALURU
SCHOOL OF ENGINEERING

TEST 1

Winter Semester: 2021 - 22

Course Code: EEE 2005

Course Name: Microprocessor and Microcontroller.

Program & Sem: B. Tech (EEE) & IV Sem

Date: 26th April 2022

Time: 11.30 AM to 12.30 PM

Max Marks: 30
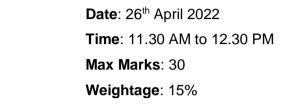
Weightage: 15%

Instructions:

(i) Read the all questions carefully and answer accordingly.

(ii) Question paper consists of 3 parts

(iii) Scientific and Non-programmable calculators are permitted.

Part A [Memory Recall Questions]
Answer all the Questions. Each question carries 01 mark. (5Qx1M=5M)

1. The Microprocessor plays a significant role in the everyday functioning of industrialized societies. Microprocessor is a digital device on a chip that can fetch instructions from memory, decode and execute them and give results. The basic functional blocks of Microprocessor are; (C.O. No. 1) [Knowledge]
   a. ALU
   b. Array of Registers
   c. Control Unit
   d. All of the above

2. All the devices used in the microprocessor-based system uses Tristate logic. In devices with Tristate logic, three logic levels will be available and they are; High State, Low State and High Impedance state. The tristate device will normally remain in high impedance state and their pins are physically connected in the system bus but ……………isolated.
   (C.O. No. 1) [Knowledge]
   a. Mechanically
   b. Physically
   c. Electrically
   d. All of the above

3. The RISC has a small set of highly optimized instructions. The designing philosophy for RISC incorporates these salient points; (C.O No 1) [Knowledge]
   a. Number of instructions should be minimum
   b. Instructions should be of same length
   c. Simple addressing modes should be used
   d. All of the above

4. The hexadecimal system is used as a convenient representation of binary numbers. It is much easier to represent a string of 0s and 1s. The hexadecimal equivalent value of 100010010110 is ……………….. H. (C.O No 2) [Knowledge]
   a. 968
   b. 689
   c. 896
   d. None of the above

5. The 8051 contains 34 general-purpose, or working, registers. Two of these, registers …………and ………., comprise the mathematical core of the 8051 central processing unit (CPU). (C.O No 2) [Knowledge]

a. R1 & R2   b. B & R7

c. A & R4   d. None of the above

Part B [Thought Provoking Questions]

Answer both the Questions. Each question carries 7.5 marks.   **(2Qx7.5M=15M)**

6. An embedded system is a combination of computer software and hardware that is either fixed in capability or programmable. An embedded system can be either an independent system or a part of a larger system. It is mostly designed for a specific function or functions within a larger system. What are the characteristics that an embedded system should have in order to be selected for a larger application? Also draw the basic block diagram of embedded system.   (C.O No 1) [Comprehension]

7. Microcontrollers are a huge part of today's world. Microcontrollers can be found in a variety of forms, whether you are driving a car, using a computer device, or brewing a cup of coffee with a coffee machine. A microcontroller can be seen as a small computer, and this is often due to the essential elements inside it. The elements of microcontrollers are: the Central Processing Unit (CPU), the Random-Access Memory (RAM), the Read-Only Memory (ROM), the Input/Output Ports (I/O Ports), the Internal Oscillator, the Electrical Erasable Programmable Read-Only Memory (EEPROM), etc., use the above elements and draw the necessary diagram to show how they are arranged.

(C.O No 2) [Comprehension]

Part C [Problem Solving Questions]

Answer both the Questions. Each question carries 5 marks.   **(2Qx5M=10M)**

8. The program status word (PSW) register, also referred to as the flag register, is an 8 bit register. Only 6 bits are used. Show the status of the CY, AC and P flag after the addition of 88H and 93H in the following instructions. Also identify the value of PSW.

    ORG 00H

    MOV A, #88H

    ADD A, #93H

    END   (C.O No 2) [Comprehension]

9. The stack is a section of RAM used by the CPU to store information temporarily. This information could be data or an address. The register used to access the stack is called the SP (stack pointer) register. The storing of a CPU register in the Stack is called a PUSH. Loading the contents of the stack back into a CPU register is called a POP. Show the stack and stack pointer from the following. Assume the default stacks area.

    ORG 00H

    MOV R6, #25H

    MOV R1, #12H

    MOV R4, #0F3H

    PUSH 6

    PUSH 1

    PUSH 4

    END   (C.O No 2 [Comprehension]

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PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

TEST 2

Winter Semester: 2021 - 22

Course Code: EEE 2005

Course Name: Microprocessor and Microcontroller

Program & Sem: B. Tech & IV Sem

Date: 1st June 2022

Time: 11:30 AM to 12:30 PM

Max Marks: 30

Weightage: 15%

Instructions:

(i)   Read the all questions carefully and answer accordingly.

(ii)   Question paper consists of 3 parts.

(iii)   Scientific and Non-programmable calculators are permitted

Part A [Memory Recall Questions]

Answer all the Questions. Each Question carries Two marks.   (5Qx 2M=10M)

1. In 8051 micro controller, the address register for storing the 8-bit addresses can be

   a) R0 of the selected bank of register
   b) R1 of the selected bank of register
   c) Stack pointer
   d) All of the mentioned   (C.O.No.2) [Knowledge]

2. In 8051 micro controller, the instruction MOV A, #65H belongs to the address mode
       a) register b) direct c) immediate d) register relative

                                                                   (C.O.No.2) [Knowledge]

3. Show the status of carry flag, auxiliary flag and priority flag of PSW after the addition of 9CH and 64H.   (C.O.No.2) [Knowledge]

4. In 8051, the RESET pin number in the pin diagram is

   (a) 9 (b)10 (c) 11   (d) 19   (C.O.No.2) [Knowledge]

Q.NO.5. In 8051, the number of address and data pins available is

   (a) 8,8 (b) 16,8 (c) 8,16 (d) none   (C.O.No.2) [Knowledge]

Part B [Thought Provoking Questions]

Answer all the Questions. Each Question carries Four marks.   (3Qx 4M=12M)

6. Mr.Venkatesh is learning keil software related programs, his professor gave an assignment to copy a block of 10 bytes of data from 35H to 60H. Develop the program for the same.

7. Mr. Hari was studying a course microcontroller; he is willing to write a program to find the number of 1's in a given byte. Suggest him and also develop the program for the same.

(C.O.No.2) [Comprehension]

8. Mr. Krishna is working at Atmel company related to the 8051 microcontrollers. He has to verify manually subtraction operation of 4C-6E in hexadecimal. Write a step-by- step solution to obtain the desired solution.

(C.O.No.2) [Comprehension]

Part C [Problem Solving Questions]

Answer the Question. Question carries Eight marks. **(1Qx 8M=8M)**

9. Mr. Ram wants a program to verify the addition property using 8051-micro controller. He assume that RAM locations 40 – 44H have the 7D, EB, C5,5B,30 hexadecimal values. At the end of the program, he need to store results at register A should contain the low byte and R7 the high byte.

(C.O.No.2) [Comprehension]

PRESIDENCY UNIVERSITY
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SCHOOL OF ENGINEERING

END TREM EXAM

Winter Semester: 2021 - 22

Course Code: EEE 2005

Course Name: Microprocessor and Microcontrollers

Program & Sem: B. Tech & IV Sem

Date: 29th June 2022

Time: 9:30 AM to 12:30 PM

Max Marks: 60

Weightage: 30%

Instructions:

 (iv) Read the all questions carefully and answer accordingly.

 (v) Question paper consists of 3 parts.

 (vi) Scientific and Non-programmable calculators are permitted

Part A [Memory Recall Questions]

Answer all the Questions. Each Question carries TWO marks.   (5Qx 2M=10M)

1. In 8051 micro controllers, while using logical instruction that affects the carry flag during its execution is

    (a) XRL A (b) ANL A (c) ORL A (d) RLC A

(C.O.No.1) [Knowledge]

2. The mnemonic used to perform a subtraction of source with an 8-bit data and jumps to specified relative address if subtraction is non-zero is
    (a) DJNZ   (b)CJNE   (c)JZ   (d)JNC

(C.O.No.2) [Knowledge]

3. Stepper motor is interfacing with microcontroller how the speed of the steeper motor can be control?
            a) by controlling its switching rate
            b) by controlling its torque
            c) by controlling its wave drive 4 step sequence
            d) cant be controlled

(C.O.No.3) [Knowledge]

4. While the dc motor is interfacing with 8051 ,then how can the direction of the DC motor be changed?
            a) by changing the torque
            b) by changing the switching speed
            c) by changing the polarity of voltages connected to the leads
            d) by changing the RPM rating

(C.O.No.4) [Knowledge]

5. 8051 Controller is interfacing with LCD,the number of data lines are there in a 16*2 alphanumeric LCD?

    a) 10 b) 8 c) 1 d) 0

(C.O.No.4) [Knowledge]

Part B [Thought Provoking Questions]

Answer all the Questions. Each Question carries TEN marks. **(3Qx10M=30M)**

6. Mr. Narasimha need to connect eight LEDs are connected to port.0 of 8051 micro controller for an particular application. Write an assembly language program to flash these LEDs with 10ms use timer 0 mode 1. (C.O.No.2) [Comprehension]

7. Mr. Naren wanted to test a complex which is written in Assembly Language Program (ALP) for a App development with the following cases.
   (a) load the accumulator with the value 55H, and (b) complement the accumulator 700 times. write the program which is satisfying the above two cases.
   (C.O.No.1) [Comprehension]

8. Mr. Ganesh was learning the addressing modes in 8051 Controller, he needs to copy the value 55H into RAM memory locations 40H to 41H using (a) direct addressing mode,(b) register indirect addressing mode without a loop, and (c) with a loop. Write the ALP for the above cases.
   (C.O.No.3) [Comprehension]

Part C [Problem Solving Questions]

Answer both the Questions. Each Question carries TEN marks. **(2Qx 10M=20M)**

9. Dr. Jayadhar measure the temperature of a patient and test it for the value 90H (in degrees). According to the test results, he stores the temperature value into the registers indicated by the following cases.
   If T = 90 then A = 90
   If T < 90 then R1 = T
   If T > 90then R2 = T. Write ALP for the same.
   (C.O.No.2) [Comprehension]

10. 16×2 LCD module is a very common type of LCD module that is used in 8051 based embedded projects. It consists of 16 rows and 2 columns of 5×7 or 5×8 LCD dot matrices. Write an assembly Language Program to display string "PRESIDENCY" on 16/2 LCD display using 8051 microcontrollers. (C.O.No.4) [Comprehension]