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EE 1816PE22

19/6/23

Roll No. of candidate

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2023

BINA CHOWDHURY CENTRAL LIBRARY
(GIMT & GIPS)
Azara, Halkhowapara
Guwahati - 781017

B.Tech. 6th Semester End-Term Examination

Electrical Engineering

EMBEDDED ENGINEERING

(New Regulation (w.e.f. 2017-18) & New Syllabus (w.e.f. 2018-19))

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks
for the questions.

Answer question No. 1 and any *four* from the rest.

1. Answer the following : (10 × 1 = 10)
- (i) What is the order decided by a processor or the CPU of a controller to execute an instruction?
- (a) decode, fetch, execute (b) execute, fetch, decode
(c) fetch, execute, decode (d) fetch, decode, execute
- (ii) How many bytes of bit addressable memory are present in 8051 based microcontrollers?
- (a) 8 bytes (b) 32 bytes
(c) 16 bytes (d) 128 bytes
- (iii) MOV A, @ R1 will
- (a) copy R1 to the accumulator
(b) copy the accumulator to R1
(c) copy the contents of memory whose address is in R1 to the accumulator
(d) copy the accumulator to the contents of memory whose address is in R1

[Turn over

3. (a) Explain the action of μC 8051, after it executes the following instructions : (5)
- (i) MOV R1, 56H (ii) MOV02, # 86H
 (iii) SETB R0 (iv) MOVX A, A+DPTR
 (v) DJNZ R5, L2
- (b) Write a program in assembly language to add two BCD numbers. (5)
- (c) Explain the action of μC 8051, when it executes the instructions given below. Also show the status of the registers used in the instructions. (5)
- MOV R2, #03H
 MOV A, #02H
 ADD A, 02H
 MOV R2,A
 DJNZ R2, L3
- Assume $RS_0 = 0$ and $RS_1 = 1$.
4. (a) Draw the functional block diagram of 8051 and explain the function of different units of the device. (10)
- (b) What are the operating modes of timer/counter of 8051? Explain the TMOD register. (5)
5. (a) Generate a square wave of 2 mSec time period using an AT89C51 microcontroller with timer 0 in mode1 on the P1.0 pin of port1. Assume Xtal oscillator frequency of 11.0592 MHz. The program can be written in assembly or in C language. (8)
- (b) Write a program in assembly or C language to transfer a letter 'Y' serially at 4800 baud continuously, and also to send a letter 'N' through port 0, which is connected to a display device. (7)
6. (a) Interface a 16×2 LCD unit to a 8051 μC in 4-bit mode. Provide program in assembly or C language to display "8051 MICRO" from the 2nd column of the 2nd row of the LCD unit. (7)
- (b) Develop a microcontroller based system to measure RMS value of a voltage source having source specifications 220V, 50 Hz. Explain the function of the interfacing circuit(s) used for this purpose. Develop the software using assembly or C language to implement the task. (8)
7. (a) What is a AVR? Draw a neat sketch of the block diagram of any of At mega 8/16/32 and label the different units. (2 + 5 = 7)
- (b) Write a AVR program in assembly or C language to transmit the letter "EE" serially at 9600 baud, 8 bit data and 1 stop bit. Do it forever. (8)

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