Total No. of printed pages = 3

EE 1816 PE 22

6/8/22

Roll No. of candidate | | | | | | | | | | |

2022

B.Tech. 6th Semester End-Term Examination

EMBEDDED SYSTEM

(New Regulations & New Syllabus)

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 questions.

1. MCQ/ Fill in the blanks : (10 × 1 = 10)

(a) The 8051 family has ———— pins for I/O

(b) The program counter of 8051 is ———— bites wide.

(c) It is necessary to add 45H to 55H. The following instructions are executed

MOV A, 45 H

ADD A, 55H

The following codes are correct

(i) True

(ii) False

(iii) Cannot say

(d) Registers ACC and B are all ———— bits wide.

(e) The following instruction SETB PSW.4 will perform ————.

(f) The 8051 has ———— number of three bytes instructions.

(g) The instruction MOV@R0,A will perform ————.

(h) If Fosc = 11.0592 Mhz, then the time required to increment the timer 1 to 8051 by 1 is ————————.

(i) Global interrupt will ———————— all timer/external and serial interrupt.

(i) Enable

(ii) Disable

(iii) Both enable/disable

(iv) None of these

(j) The Atmega32 contains ———————— of code RAM.

2. (a) Explain the action of a μc 8051 microcontroller after executing the following instructions: (4 × 2 = 8)

(i) MOV R0, #42H

(ii) SETB P2.1

(iii) DJNZ RS, L1

(iv) ANL A, P2

(b) Provide the format of SFR IE (Interrupt Register) of 8051 and explain the functions of each bit. Develop program in assembly language to activate INT0 interrupts of μc 8051 and complement the port P2 for any interrupt signal at INT0. (7)

3. (a) Provide the format of SFR TMOD (Timer Mode Control Register). Develop program in C or assembly language to configure timer-0 operation in mode 1 with initial count 4455H. (5)

(b) Provide the format of SFR TCON (Timer Control Register) explain the different bits of this SFR. (5)

(c) Develop software in assembly or C language to load the port P2 with FFH, if P1.0 pin reads the pin status as "1" otherwise load the port P2 with 00H (5)

4. (a) Explain the significance of different bits of SCON of μc 8051 Develop assembly or C language program to send 8-bits data through TxD pin in serial mode with start and stop bits The BR for the serial data transfer is 1200 bit/sec, assume crystal frequency of the system as 12 Mhz. (7)

(b) The 16X2 LCD unit is interfaced to a μc 8051 to configure it in 8 bit mode with 5X10 dot matrix display. Develop software in assembly or C to display EE at first low and your roll number in second row of the LCD unit. (8)

5. (a) Keys are interfaced to pins P1.0 and P1.2 of Port-1 of μc 8051. The State of the pins is to be "0" (i.e., 0 volt), when a key is not pressed When a key is pressed the state at pins is to be "1" (i e, 5 volt) Develop software in assembly or C language to set the port P2 for the different key pressed condition, given below:- (5)

P1.0	P1.2	P2
Pressed	Pressed	1 1H
Pressed	Not pressed	22H
Not pressed	Pressed	33H
Not pressed	Not pressed	44H

(b) Provide SPI (serial Peripheral Interface) protocol and significance of all the term associated with it. (4)

(c) Develop program in assembly language or C for 8051 to blink port P2 using delay, which is generated using a software delay routine. (6)

6. (a) Develop program in assembly language or C for 8051 to compliment port P1 using delay, which is generated using timer-0 vector routine call corresponding to vector location 000BH. Configure time-0 in mode-1 with initial values of TH0 and TL0 as zero. (8)

(b) Explain the use of DDR (Data Direction Register) of ATmega 32 Provide program in C to configure PORT A and PORT B of ATmega 32 as output and input port respectively Further check/read input at PORT B and if it is equal to 01 H load PORT A with F1H. (7)

7. Answer the following: (15)

(a) Explain, how INT1 is to be use for counter/timer operation of counter/timer-1 in mode 1 with GATE control of 8051.

(b) Provide reset circuit for microcontroller 8051 and explain the function of the circuit.
