Exam. Code: 0928
Sub. Code: 6566

2054

B.E. (Electronics and Communication Engineering)

4th Semester

EC-402: Microcontrollers and Interfacing

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: ***Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.***

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I. Attempt the following: -

(a) Diagrammatically show difference between Microcontroller and Microprocessor.
(b) List all the important features of PIC18F.
(c) Calculate the maximum delay generated by 8051 timer in mode 1. Assume that XTAL-12MHz.
(d) What is the difference between RLCF 07H, 0, 1 and RLCF 07H, 1, 0.
(e) Draw the status register of PIC18F.
(f) Why 8051 microcontroller is called 8-bit microcontroller?
(g) Write instruction(s) to mask Serial, Timer 1 and external interrupt 0 while unmasks all others.
(h) What is softwarekey debounce?
(i) Differentiate RISC and CISC architecture.
(j) What is busy flag in LCD?

(10×1)

UNIT-I

II. (a) Explain briefly various types of internal ROM memories available in microcontrollers.

(b) After the execution of the program, what are the contents of register A and flag register Also, allocate address to each instruction if the starting address is 3000H

```
3000H        MOV B, #01H
MOV A, #30H
                          MUL AB
 XRL A, #0FFH
                          CPL A
JB 0E0H,SKIP
                          SETB C
                          ACI 0AAH
                          SJMP AHEAD
SKIP:  RRC A
AHEAD:NOP
```

(c) What happens after following statements

ORG 0100H
DB 12, 0BH, 11111111B, "XYZ", '2'

How many memory locations will get consumed after above initialization?

(3+4+3)

III. (a) Draw the pin diagram of 8051.

(b) In some manufacturing unit there is a conveyor belt (packets are moving on it) with some sensor. Whenever a packet passed across the sensor, a pulse is generated. Write 8051 ALP to count the number of packets passing across the sensor and when the count reaches 90, display F on SSD (Common anode). Show interfacing diagram.

(c) List all the bit addressable SFR's of 8051.

(3+5+2)

P.T.O.

IV. (a) Write a sub-routine to generate a delay of 5 seconds. Assume that XTAL-12MHz.

(b) Write 8051 ALP to count number of ones in a number stored at ROM location 0200h. Store the result in RAM location 30H

(5+5)

UNIT-II

V. (a) Draw the File register of PIC18.

(b) Suppose two random 8-bit numbers are stored in file register locations505H and 506H respectively. Write PIC ALP to compare the two numbers and then replace the greater and shorter number with FFH and 00H respectively.

(c) Suppose some random number is present in WREG. Write PIC ALP to check whether the number is even or odd. If the number is even then store FFH in WREG otherwise store 00H.

(2+5+3)

VI. (a) Write 8051 ALP to transmit "I live in India" serially at 2400 baud, 8-bit data with one stop bit. Assume crystal frequency=15MHz.

(b) Write 8051 ALP to identify and encode any key pressed on a 2x4 matrix keyboard interfaced to 8051. Draw hardware interfacing diagram also.

(5+5)

VII. (a) (Show diagram). LM35 is connected to last analog line of 0808 A/D converter interfaced to 8051. Write 8051 ALP to continuously check the temperature and if the temperature falls below 35^0C then OFF the LED connected to 8051otherwise keep it ON.

(b) Show diagram). Interface Stepper motor to 8051. Write 8051 ALP to rotate stepper motor with half-drive mode 180^0 clockwise with a delay after every step. Assume that step angle 1.8^0 and XTAL-12Mhz.

(5+5)

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