Q.1 (a) What is the register structure of PSW in 8051.(b)How can you move 53H data from accumulator to R2 register of register bank 1. (c)Write a code in assembly language to identify whether a number given to port 1 is positive or negative. The status of the number is shown by an LED connected to Port 2.0. When even LED 'ON', OFF otherwise.

2+1+5=8

Q.2 (a) What is the functions of EA pin in 8051? (b)Two external RAM are to be interfaced with 8051. RAM1 will have address range of 1000h-1FFFh and RAM2 will have 3000h-3FFFh. Draw the circuit diagram for the interfacing. (c). There are 10 data bytes stored in internal RAM location starting from 50h. Write an assembly code to copy odd data bytes to RAM1 as in the earlier question. Assume DATA: ORG 50 DB 42h 53h 24h 33h 80h 78h 65h 45h 36h AAh

'OR'

(a) Arrange 8051 interrupts as per their priority order. (b) Which registers are necessary in interrupt service? (c) Write a firmware code to display elements of a Fibonacci series to a 7 segment LED display connected to port 1 of 8051 after a fixed time interval. (Assume the time interval to be arbitrary)

1+2+4=7

Q.3 (a) Write the functions of each bit in TMOD register. (b) Write a subroutine 'DELAY' to generate a delay of 1sec using Timer 0 in mode 1 for the function given below. Assume 8051 Clock frequency 11.0592 MHz.

```
ORG 00h
MOV P1, #00h
HERE: CPL P1.1
ACALL DELAY
SJMP HERE
END
```

`OR'

(a) What is the indexed addressing mode in 8051? Give one example (b) Find the time delay from the subroutine:

```
MOV R1, #0FFh
LEVEL: NOP
NOP
NOP
NOP
DJNZ R1, LEVEL
```

Use clock frequency of 12MHz. Show all necessary calculations

2+3=5