12th April 2005

Microprocessor Systems
Visa Exam

1- Calculate the value of the 8-bit Accumulator (A) in hexadecimal number system at the end of logical and arithmetic operations listed below.

a)
```
MOV   A,#0AAH
ANL   A,#0FH
ORL   A,#20H
XRL   A,#0F0H
                    ; A=( ? )16
```

b)
```
MOV   20H,#100D
MOV   R0,#21H
XRL   20H,#31D
DEC   R0
MOV   A,@R0        ;  A=( ? )16
```

c) Write the subroutine that serially sends 8 bit accumulator(A) value to an external component through 2 port pins (Data:P1.0 , Clock:P1.1) of the microcontroller and returns the main routine by keeping the initial value of A. It will be assumed that external component will sample the data bits on each rising edge of the clock signal.

2- An 8 bit CPU having 64kBytes addressing capability will be connected to a memory block that contains 2 pieces of 27C128 EPROM, 1 piece of 62C64 static RAM and 1 piece of 28C16 EEPROM. Reset vector of the CPU assigns ProgramCounter=0000H.

a) Draw the memory-addressing map of the described system and related logical chip selection table for the decoder.
b) Draw the decoder circuit scheme by using minimum number of NAND gates only.
c) Draw the circuit scheme of the system by using 74HC138 as the decoder IC.

Duration : 90minutes 1- a)10P b)15P c)25P 2-a)10P b)15 c)25P