

1. Explain the following
 - A) General Purpose Registers
 - B) Address Bus
 - C) Demultiplexer
 - D) XOR Logic Gate
 - E) Decoder
2. Design a 2 bit count-down counter. This is a sequential circuit with two flip flops and one input x. When $x=0$, the state of the flip flop does not change. When $x=1$, the state sequence is 11,10,01,00,11 and repeat.
3. Multiply following two signed magnitude fixed point numbers & show the value of A, Q Registers, E –bit and Sequence Counter in the process. Use 6 bit registers including the sign bit. Show the complete table.
(+29) X (-17)
4. Write a program in the assembly language to find the average of 5 numbers.
5. Explain the following
 - A) Processor Bus organization
 - B) Parallel Processing
6. Give the procedure for addition & subtraction of floating point numbers. How we convert a given number into a normalized number & prepare it for addition and subtraction. Design the algorithm for Addition & subtraction of floating point numbers.
7. Explain the following in detail
 - a) Direct Memory access
 - b) Inter Process communication & Synchronization
8. Write detailed note on Characteristics of multiprocessors.
9. Elaborate the following terms
 - a) Encoder
 - b) Virtual cache memory
 - c) Arithmetic operators
 - d) Addressing modes
 - e) Memory Management Hardware
 - f) $(54.12)_8 = (\quad)_{10}$
 - g) What is wrong with Register Transfer instructions xT: $AR \leftarrow AR$, $AR \leftarrow 0$
 - h) What is the formula to calculate the effective address if index register, base register, scaling factor & displacement is given.
 - i) How the Binary counter & BCD counter behave differently.
 - j) Expand CMOS