Assignment on Computer Organization (IT303)

1. How is interrupt I/O deferent from programmed I/O? Can a memory mapped I/O employ interrupt I/O? Explain.

2. Give main reasons why DMA based I/O is better in some circumstances than interrupt driven I/O?

3. What is vectored Interrupt? How are they used in implementing hardware interrupt?

4. Two operands undergo bit-wise logical operation to give a result. Suppose operand A is 1010 1010 and result is 1111 1111, determine the B operand and the logic function utilized to get the result.

5. Design a CSA tree (Wallace tree) to reduce a 16 summands to 2 and explain it with a diagram. What time does it take for n summands?

6. Explain how a RAM of capacity 2 KB can be mapped into the address space (1000_H) to ($17FF_H$) of a CPU having a 16-bit address lines. Show how the address lines are decoded to generate the chip select condition for the RAM.

7. Design two lights (one green and the other red) that will make the green light glow if the result is normal. The red light will glow if there is an overflow in the result.

8. A floating point number system uses 16 bits for representing a number. The most significant bit is the sign bit. The least significant nine bits represent the mantissa and remaining six bits represent the exponent. Assume that the numbers are stored in the normalized format with one hidden bit.

   (a) Give the representation of -1.6×10^3 in this number system.
   (b) What is the value represented by 0 000100 110000000?

9. Describe different addressing modes of class III category.

10. Write the flowchart for Restoring and Non Restoring Division algorithm and use the flowchart to divide

   (a) 5 and 2
   (b) 7 and 3
   (c) 3 and 9
   (d) -5 and 6
   (e) -4 and -3

11. How can the Non Restoring division algorithm be deduced from Restoring division algorithm?