INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR

Computer Science and Engineering

Switching Circuits and Logic Design (CS21002)

Assignment – 1 (Spring)

Group: _____ *Marks:* 30

Answer ALL the questions using xournal or similar software to edit the PDF

Q1: Given that $(16)_{10}$ = $(100)_b$, determine the value of b. 4

Q2: The n-bit fixed-point representation of an unsigned real number X uses f bits for the fraction part. What is the range of decimal values for X in this representation? 5

Q3: Encode each of the ten decimal digits 0, 1, . . . , 9 by means of the weighted binary code 7 3 2 -1. 5

Q4: Design a circuit which converts a four bit input binary number to a five bit output representing the radix-12 representation of the input number and a carry-out bit. You may use a 4-bit binary adder block and basic logic gates. 8

Q5: Prove that the Hamming distance satisfies the triangle inequality. That is, show that $HD(x, y)+HD(y, z) \geq H(x, z)$. 8