Ahsanullah University of Science and Technology

Course No: CSE3109 **Course Name:** Digital System Design

Semester: Fall20 **Date:** 2.9.2021

Marks of each question is given in the right side of every question.

TIME: 20+10 mins

1. A combinational circuit is specified by the following three Boolean functions: $F1(A, B, C) = \Sigma(1, 3)$ $F2(A, B, C) = \Sigma(0, 5, 7)$ $F3(A, B, C) = \Sigma(0, 1, 3, 5, 7)$ Implement the circuit with a decoder construction with NAND gates and NAND or AND gates connected to the decoder outputs. Use block diagram for the decoder. *****Minimize the number of inputs in the external gates.**	02
2. Suppose, shift register A and shift register B have 0110 and 1010 values respectively. What will be the values of A and B after performing the serial transfer up to 4^{th} shift? Show the values of each step.	02
3. What is the advantage of a PLA over a ROM? Design a combinational circuit using a PLA where the circuit accepts a 2-bit binary number and generates an output binary number equal to the cube of the input number. Derive the PLA program table for this circuit.	06