

1) Describe the roles of each of the five major components of a computer. (5 pts)

1 – Input: Instructions (program) or Operands that supply data to a computer

2 – Output: Results from computations executed in a computer.

3 – Memory: Storage for data and instructions

4 – Datapath: Performs actual computation within a computer, for example the Arithmetic Logic Unit or ALU

5 – Control: Logic circuitry that tells the datapath what to do

2) Given the following logic equation:

$$f(x,y,z) = xy \text{ OR } yz \text{ XOR } xz$$

construct Truth Table, SOP equation, and Circuit using sum-of-products logic. (15 pts)

Truth Table:						$m_i =$		$m_i \text{ XOR } xz$	SOP minterms
x	y	z	xy	yz	xz	$xy \text{ OR } yz$	m_i		
0	0	0	0	0	0	0	0		
0	0	1	0	0	0	0	0		
0	1	0	0	0	0	0	0		
0	1	1	0	1	0	1	1	$\underline{x}yz$	
1	0	0	0	0	0	0	0		
1	0	1	0	0	1	0	1	$x\underline{y}z$	
1	1	0	1	0	0	1	1	$xy\underline{z}$	
1	1	1	1	1	1	1	0		

SOP Equation: $f(x,y,z) = \underline{x}yz \text{ OR } x\underline{y}z \text{ OR } xy\underline{z}$ where \underline{x} denotes NOT(x)

