Title: **Simple Water Supply Control** Job: 16

Course: Intro to Automation Unit: Intro to PLC CLO: 4

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Grade \_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Objectives**

1. Student shall design a motor control circuit for a single-phase pump.
2. Student shall develop process control design skills.
3. Student shall construct a basic level control scheme.

**Assessment**

Students shall demonstrate a comprehension of the objectives listed above by scoring a minimum of 75% on this Job. Grading shall be based on the Intro to PLC rubric.

**Devices**

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| Inputs | | |
| *Device* | *Description* | *Symbol* |
| Mushroom Head Pushbutton | Emergency Stop | ESTOP |
| Two-position Selector Switch | Off or Auto | OFF\_AUTO |
| Float Switch (M-BLU-40-W) | Low Level Switch | LO\_LVL |
| Outputs | | |
| *Device* | *Description* | *Symbol* |
| Green Pilot Light | Pump Running | RUNNING |
| Yellow Pilot Light | Auto Control | AUTO |
| Red Pilot Light | Pump Stopped | STOPPED |
| Blue Pilot Light | Tank Empty | EMPTY |
| Eight-Pin 24VDC Relay | Pump Control | PC1 |
| 120VAC Motor | Pump | PMP1 |

**Instructions**

Design an automatic control scheme that shall control the supply of water from a municipality’s water tower utilizing the devices listed above. Using the input from a float switch, control a pump at the bottom of the tank to supply water to the town. If there is water present in the tank, the pump shall run providing water pressure throughout the supply system. The circuit can be turned on or off using a selector switch. The entire control scheme shall be protected by an ESTOP. Use the components listed above to design the circuit. Study the associated datasheet for the level switch before embarking on your design. Whenever the pump is running, the green light shall illuminate, and the red light shall be off. When the motor is not running, the green light shall be off, and the red light shall illuminate. The yellow light shall indicate when the circuit is on (AUTO). The blue light will indicate when the tank is “empty”. The pump control relay shall be connected to both DC, for control signals, and AC, to start/stop the pump. Ensure that all voltages are separated. Use the space on the opposite side of this page to design the circuit. Once complete, review the design with the instructor. After obtaining approval, wire the circuit. Ensure to label all wires with the appropriate wire numbers. Have the instructor review all wiring before energizing the circuit. Render the schematic using a CAD type software package. Post the schematic to the student share folder using filename I2P Job 16 – name.ext.

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Discussed design \_\_\_\_\_\_\_\_ Test Logic \_\_\_\_\_\_\_\_ Energized Test \_\_\_\_\_\_\_\_