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| **Course Name:** | **Digital Electronics** | **Semester:** | **III** |
| **Date of Performance:** |  | **Batch:** | **A - 3** |
| **Faculty Name:** |  | **Roll no.:** | **16014022050** |
| **Faculty Sign & Date:** |  | **Grade/Marks:** | **\_\_\_ / 25** |

**Experiment no.: 9**

**Title: Vending Machine**

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| **Aim and Objective of the Experiment:** |
| * Design a vending machine which accepts Rs. 10 and Rs. 20. The machine dispose soft drink for Rs.50 and returns balance if any. Design as mealy machine. |

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| **COs to be Achieved:** |
| **CO4:** Analyze and design synchronous sequential circuits using flip flops. |

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| **Theory:** |
| **Mealy Machine –**  In the theory of computation, a Mealy machine is a finite-state machine whose output values are determined both by its current state and the current inputs. A Mealy machine is a deterministic finite state transducer: for each state and input, at most one transition is possible.  **Moore Machine –**  A Moore machine is a finite-state machine whose output values are determined solely by its current state. This is in contrast to a Mealy machine, whose output values are determined both by its current state and by the values of its inputs.  **Vending Machine –**  A machine that dispenses small articles such as food, drinks, or cigarettes when a coin or token is inserted. |

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| **Stepwise – Procedure:** |
| 1. **Draw the state diagram.** 2. **Write the state table.** 3. **Design using JK flip flops and gates.** 4. **Draw the circuit Diagram.** 5. **Implement it using circuit verse online simulator.**   **Add your design (handwritten) and Circuit Verse Diagram for the design.** |

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| **Post Lab Subjective/Objective type Questions:** |
| 1. **A clocked synchronous sequential should have an output z=1, if the total number of zeros received is an odd number greater than 1, provided that two consecutive ones have never been received. Design the machine using minimum risk approach method and T FF.** |

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| **Conclusion:** |
| The experiment demonstrated the successful implementation of a Mealy Machine for designing a vending machine. This machine accepts Rs.10 and Rs.20 inputs, dispenses a soft drink for Rs.50, and returns the balance if any. The Mealy Machine model was chosen because its state transitions are determined by both the current state and the current input, making it ideally suited for this application. |

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| **Signature of faculty in-charge with Date:** |