MILITARY INSTITUTE OF SCIENCE AND TECHNOLOGY

COURSE CODE: EECE 304

Project Title:

Electronic Voting Machine

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Project Name: Electronic Voting Machine

Objectives:

- To operate the system for successive voters and to ensure that a voter can give only one vote to his/her chosen candidate of the same position.

- To check and declare a voter valid after checking the NID number.

Theoretical Background:

An Electronic Voting Machine (EVM) system is proposed which is in operation as transparent as the digital system. The Simplified Electronic Voting Machine (SEVM) responds on some flow of pulses coming from the switch operated by voter and produces the output of the counting values i.e. total casting votes of individual nominee and displays it. The machine is controlled both automatically and manually to operate the system for successive voters and to ensure that a voter can give only one vote to his/her chosen candidate of the same position. The manual controlling system must be operated by presiding officer who have the authorization to check and to declare a voter valid after checking some unique information. Designing and implementing of this SEVM system is very plain and convenient due to having discrete digital circuitry.

Equipment required:

- Basic logic gates
- Switches
- CD4510 Up/Down Counter IC
- 74LS48 BCD to 7 segment Decoder

Procedure:

- **Verification of a valid voter**: We used a comparator circuit which exhibits whether the given inputs are equal or not. Here the first input is taken from the voter which is his NID number. Considering this NID number as a reference, comparator compares it with all the valid stored data in server. When the comparator output is HIGH the voter is declared as a valid voter and allowed to proceed further.

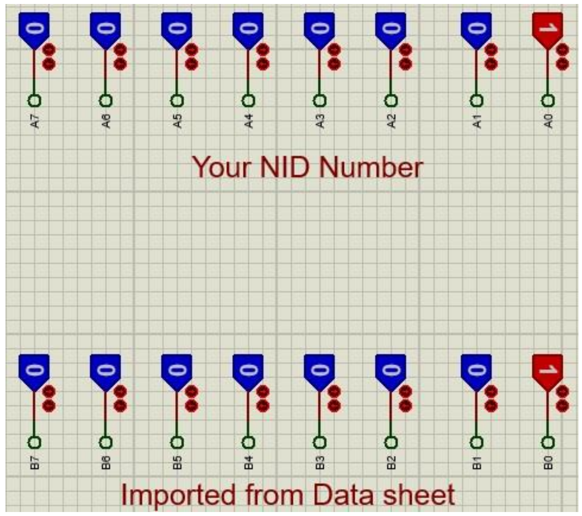


Fig: Taking NID as input

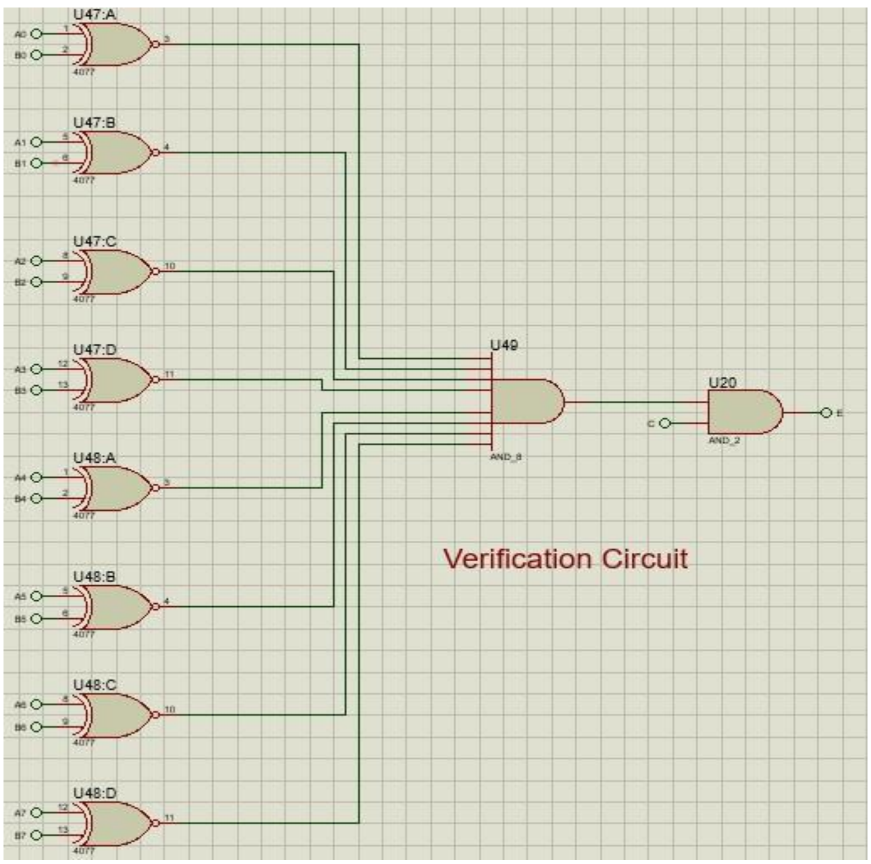


Fig: Comparator

- **<u>Selecting Candidates:</u>** We used to a 4 to 2-bite encoder with a SPDT Momentary action switch to Select the Candidate. When one voter pushes the switch to select one candidate switch gives one pulse to the encoder and encoder encode the pulse for desire candidate and send the output in mux selector pin to count one vote for the desire candidate. When any voter push the button to vote candidate-A SPDT switch connect with a not gate and encoder gate a high input. When candidate-A input high we gate output from the encoder 0, 1 its goes to the Mux selector pin for the count the vote 1.

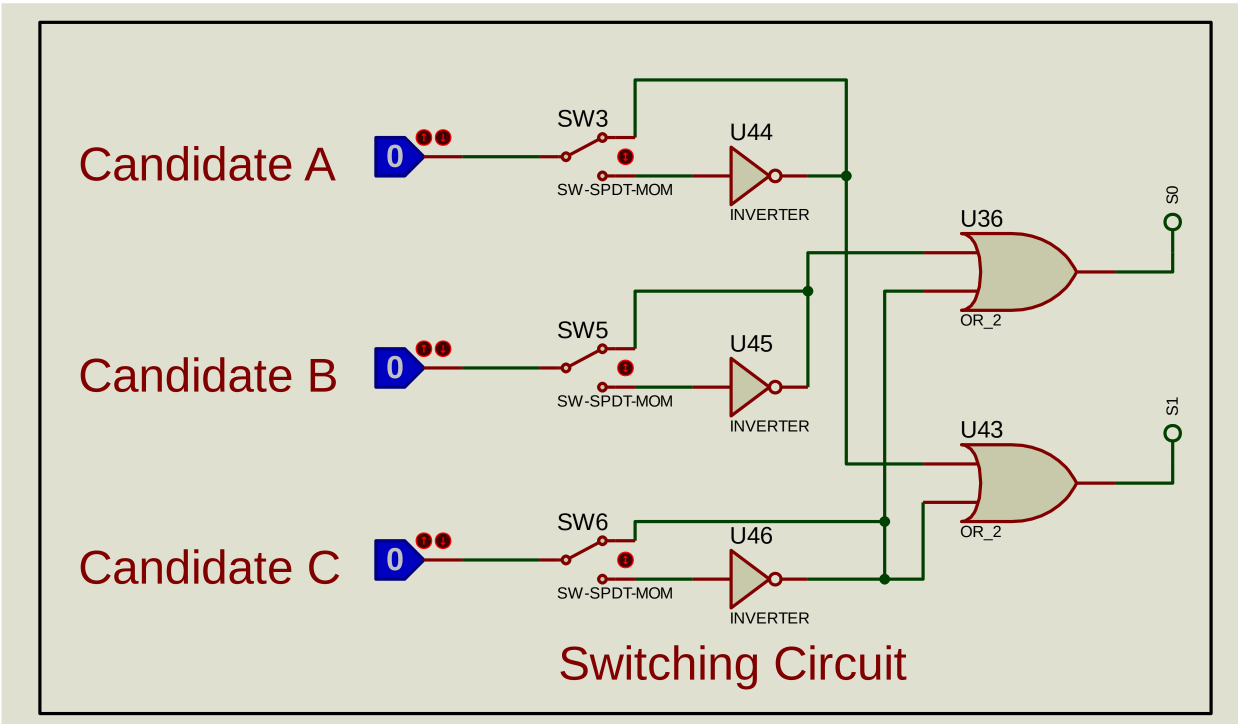


Fig: Switching circuit

- **<u>Voting Mechanism:</u>** We used MUX & DEMUX for selecting candidates and pass the result to counter circuit.
  Multiplexer refers to a type of combinational circuit that accepts multiple inputs of data but provides only a single output. On the other hand, De-multiplexer accepts only a single input but directs it through multiple outputs.

  By using multiplexer, we picked one voter’s desired candidate among other candidates and the De-multiplexer is doing the job passing the output to counter circuit through different selector pin combination.

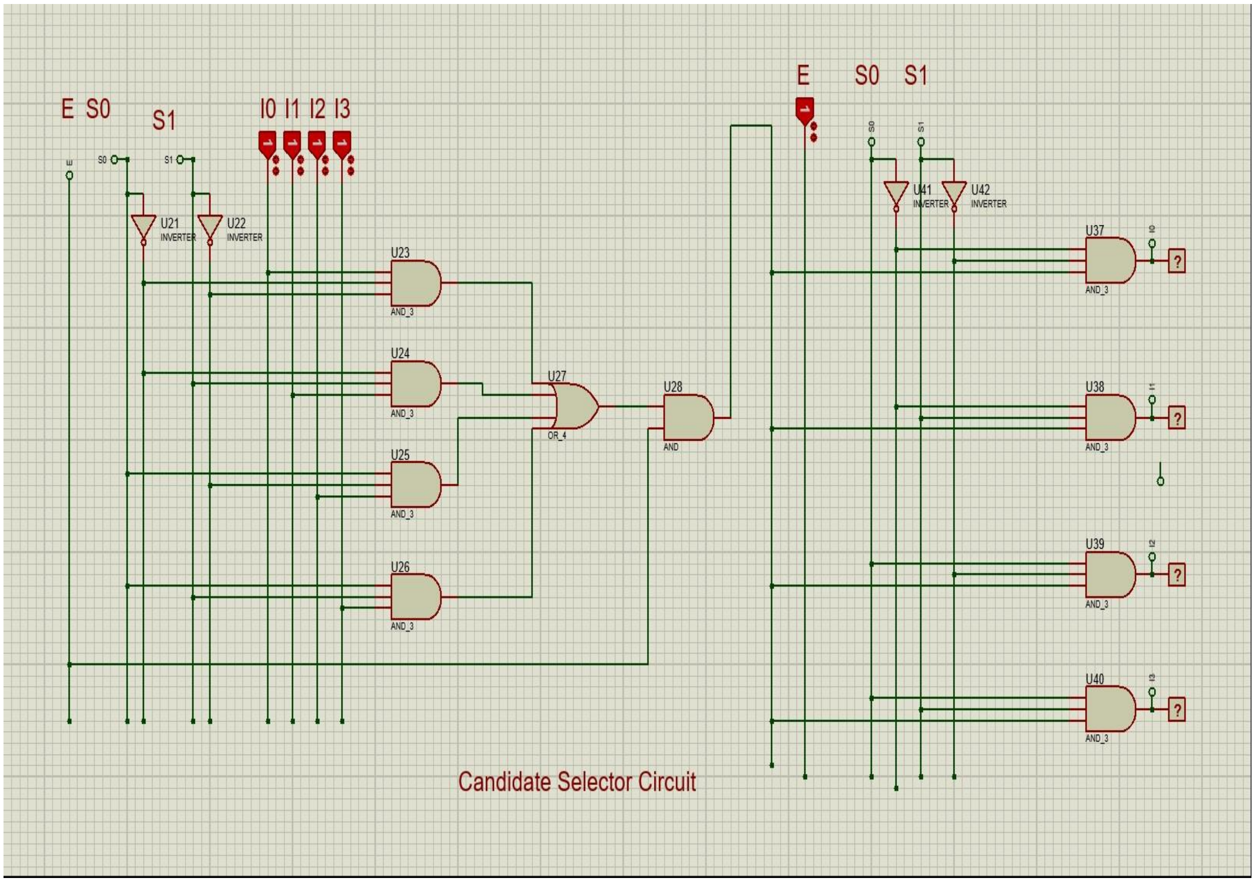
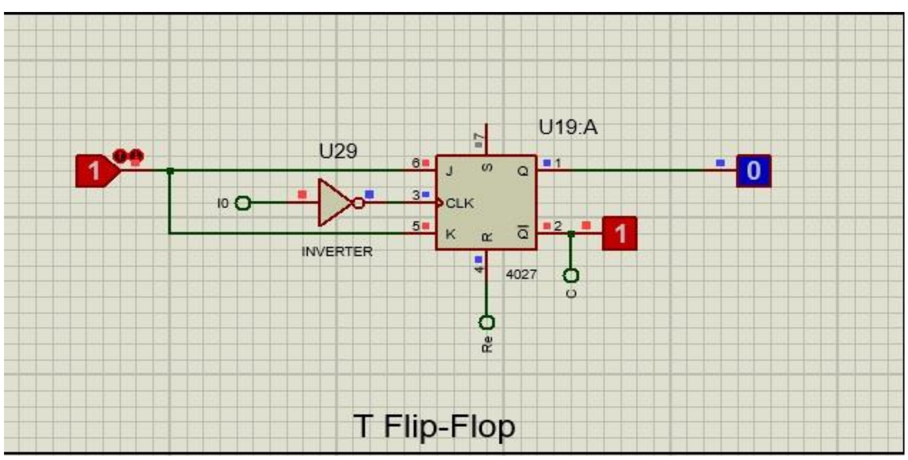


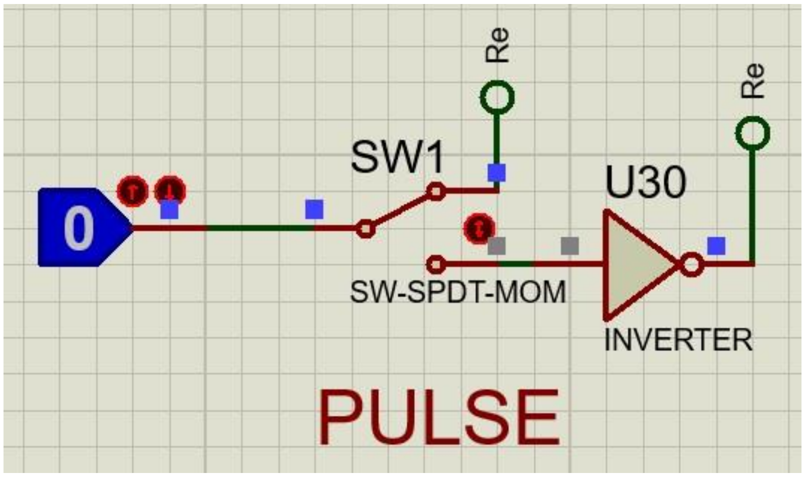
Fig: Mux & De-mux

- **<u>Reducing Over voting:</u>**

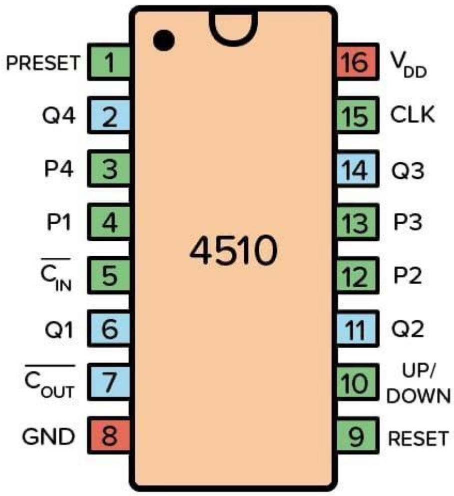
We used a T-Flip-flop to make LOW the enable pin(E) of multiplexer to avoid over voting.



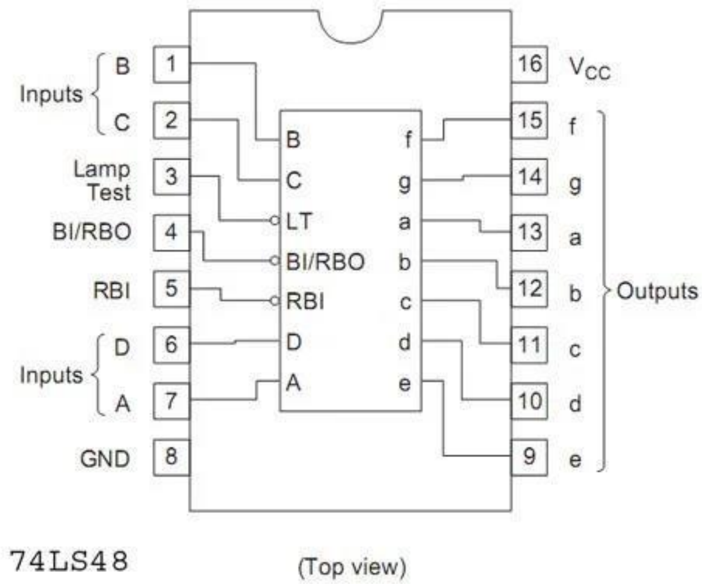
A pulse circuit is used to make the enable pin HIGH again for taking the next valid vote. This pulse is generated using a microcontroller when the NID input is changed.



- **Counter Circuit:** We used a synchronous up counter which can count from 0 to 999 in decimal number system. Basically we cascaded three CD4510 IC to count three bit of decimal number.



Another IC named 74LS48 BCD to 7 segment Decoder is used to display numbers decoded in BCD format. To show up to 999 we cascaded three of it.



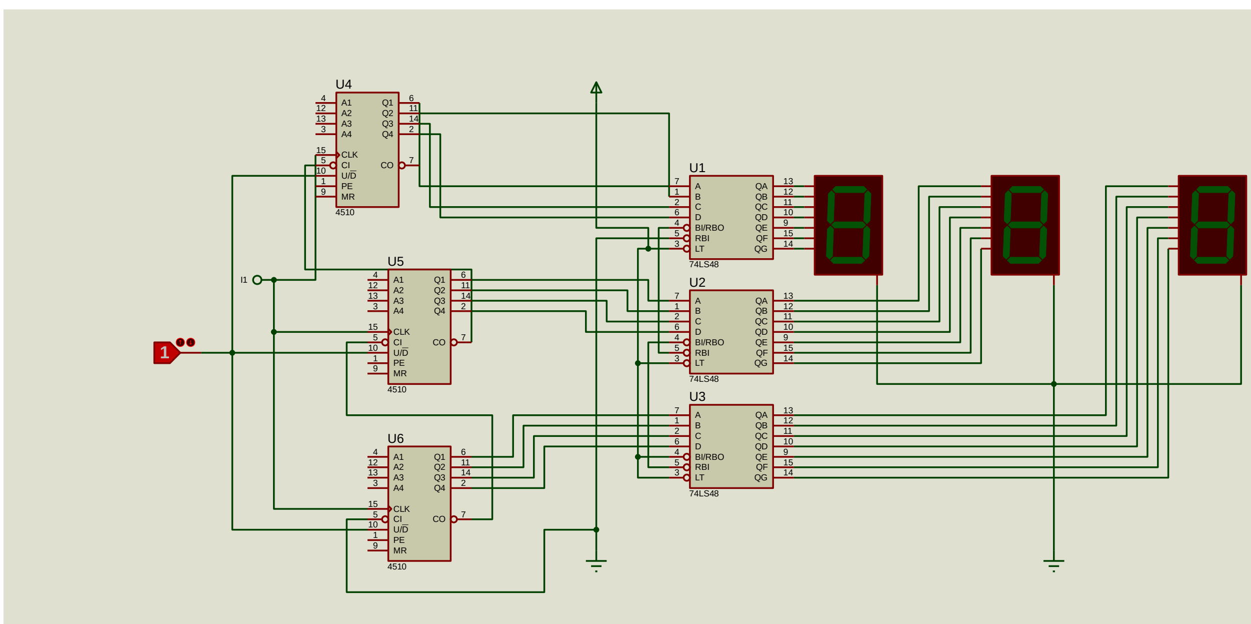
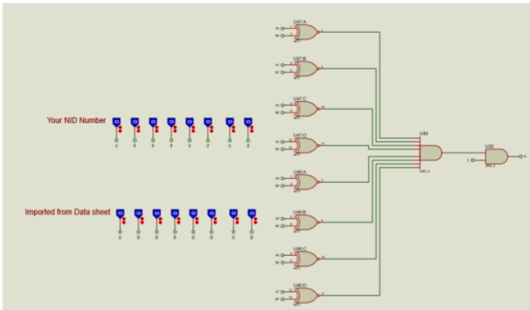
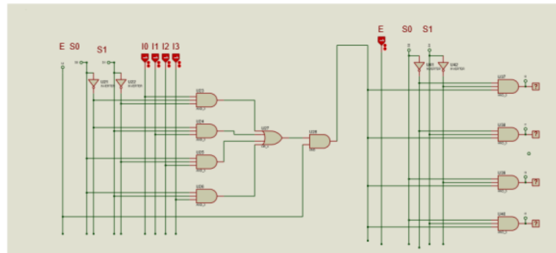
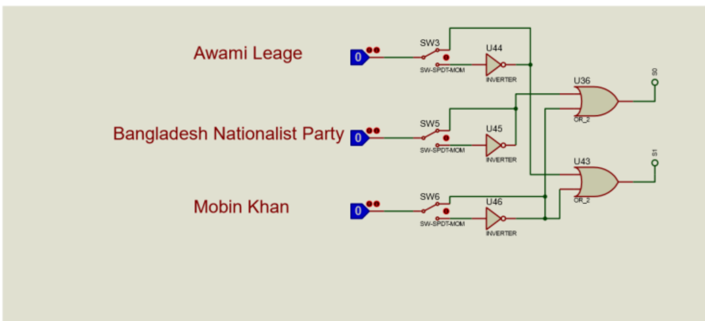


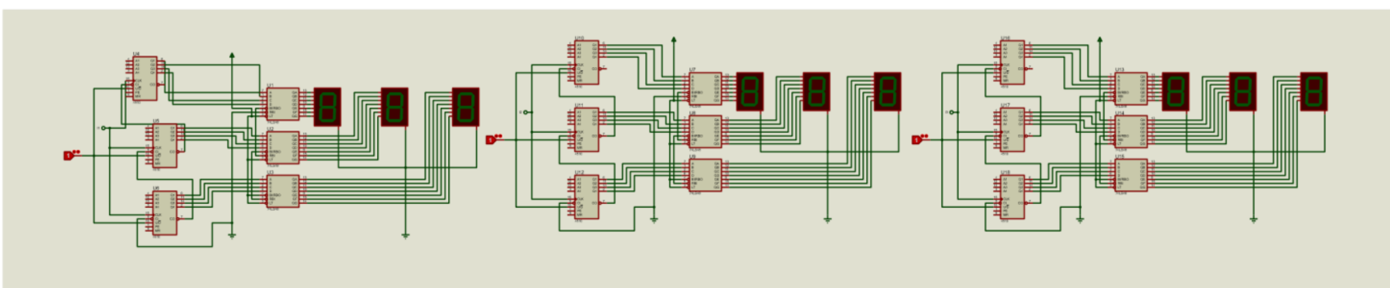
Fig: Counter circuit

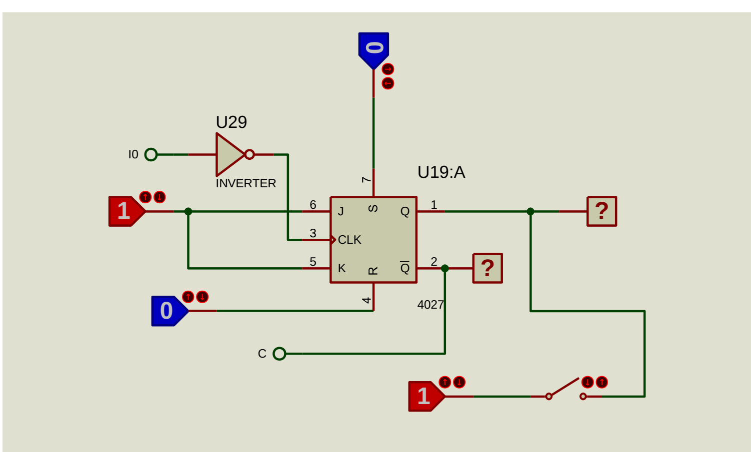
<u>**Circuit diagram:**</u>











Advantages of EVM:

- Accuracy: EVMs eliminate the possibility of error in vote counting as they automatically record and store the votes electronically, reducing the chances of human errors or misinterpretation.

- Efficiency: EVMs facilitate a faster and more efficient voting process compared to traditional paper-based voting systems. The electronic recording and tabulation of votes enable quicker results and reduce the time and effort required for manual counting.

- Transparency: EVMs provide transparency in the voting process. The machines have a display screen that allows voters to verify their selected candidate before finalizing their vote. This helps ensure that votes are recorded accurately as per the voters' intent.

- Reduced Invalid Votes: EVMs reduce the incidence of invalid votes due to errors such as overvoting. The machines are designed to prevent these types of errors, guiding voters to cast valid votes by indicating if they have made any mistakes.

- Cost-Effective: EVMs can be cost-effective in the long run compared to traditional paper-based voting systems. Although the initial investment may be higher, EVMs eliminate the recurring costs associated with printing, distributing, and storing paper ballots.

- Quick Results: EVMs allow for swift tabulation and announcement of election results. This expedites the electoral process, reducing the time between voting and declaration of results, which can enhance public trust and confidence in the election outcome.

Disadvantages of EVM:

- Technical Malfunctions: EVMs can experience technical glitches or malfunctions, which may result in disruptions during the voting process or inaccurate recording of votes.

- Vulnerability to Hacking: EVMs can be susceptible to hacking or tampering, potentially compromising the integrity and security of the voting system. This could undermine public trust in the electoral process.

- Lack of Paper Trail: Some EVMs do not provide a paper trail or verifiable audit trail, making it difficult to verify the accuracy of the recorded votes in case of disputes or recounts.

- Dependence on Technology: EVMs rely on electronic systems and software, making the voting process dependent on technology. Power outages, system failures, or cyberattacks could disrupt the voting process and hinder voter participation.

- Limited Transparency for Voters: Voters may find it challenging to understand the inner workings of EVMs, including the software used and the security measures in place. This lack of transparency can raise concerns about the credibility and fairness of the voting process.

- Accessibility Challenges: While EVMs can be designed to be accessible, there may still be challenges for certain groups, such as visually impaired individuals or those with limited technological literacy, in using the electronic interface effectively.

<u>Discussion:</u> The purpose of this experiment is to study the functionality and implementation of MUX, DEMUX and Basic Logic Gates. The Circuit was designed to perform basic operations like selecting, deselecting and comparing.

This experiment is implemented on PROTEUS version 8.0 and the circuit was constructed by using basic logic gates, IC’s and switches. It can detect if any voter tries to give vote twice, thus make it more efficient and effective. We can change the circuit accordingly to the number of voters of any certain area.

In summary, EVM offer several advantages such as accuracy, efficiency, transparency, and reduced invalid votes. However, it is crucial to address concerns related to security, verifiability, accessibility, and public perception to ensure the integrity and acceptance of EVMs as a reliable voting technology.