### American International University- Bangladesh

**Department of Electrical and Electronic Engineering**

**EEE 2104: Electronic Devices Laboratory**

**Title:** Implementation of rectifier circuits and analysis of logic gates [AND, OR, NOT, NAND and NOR gates] and justification of the analysis with respect to simulated and experimental data (followed by the given constraints).

**Objective:** In electronic device laboratory, the concepts, application of diodes in practically as well as by simulation are studied. One of the applications of diode is rectification to get the DC voltage from AC voltage. In this open-ended lab, students first design a full wave rectifier which gives the stable DC voltage and they will use this DC voltage to see the different logic gates implementation. Besides the experiment, they have to write a report after comparing the simulation and experiment data.

**Instructions:**

* Gather adequate knowledge about the experiment by thorough literature review.
* Construct the full wave rectifier with stable DC voltage in lab with appropriate apparatus.
* Choose parameter values accordingly with proper reasoning behind choosing so.
* Apply this voltage to implement the logic gates to justify their different logic levels.
* Include the experimental set-up and simulation of the experiment in your report and compare it with the experimental results.
* Limitation along with the hypothesis to overcome the obstacles and explanation of any uncertainties and/or outliers/questionable data must be stated in discussion and conclusion section.

**OEL report:**

After completing the experiment, students will generate a report which will include the following sections:

* Experiment title
* Objective of the experiment
* Literature review
* Circuit diagram
* Apparatus list with proper values (where applicable)
* Result
  + Experimental data table and wave-shape
  + Simulated data table and wave-shape.
* Data interpretation and analysis
* Discussion and conclusion
* Reference (IEEE style).

**Rubric to be followed for evaluation (to be filled by faculty):**

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| --- | --- | --- | --- | --- | --- |
| **Category** | Proficient  [4] | Good  [3] | Acceptable  [2] | Unacceptable [0-1] | Secured Marks |
| State of Art  **(K2)** | Thorough study of the concepts and identification of principles that can answer all the possible questions correctly | Background knowledge is not sufficient to carry on the experiment although the proper concepts and principles identified, with minor error | Background studies are inadequate and concept is not clear | Incorrect identification of problem with no or very little background knowledge. |  |
| Selection of Appropriate Tools and Methods | Relevant and smart selection of equipment along with proper methodology to achieve desired objectives | Selection of equipment and methodology is satisfactory with little reasoning mentioned | Selection process is not adequate with little reasoning mentioned | Selection process is faulty with unnecessary and irrelevant choice and no reasoning mentioned. |  |
| Data validity and Interpretation  **(K8)** | All of the criteria are met; completion of hardware implementation and simulation is correct; results are described clearly and accurately with proper interpretation of data | Most criteria are met, but there may be some lack of clarity and/or incorrect information. Hardware and software implementation is correct | Analysis and results do not match exactly with the theoretical values and/or analysis is unclear. Experimental setup and simulation are somewhat faulty | Analysis and solution are missing or incorrect. Experimental setup and simulation are incorrect |  |
| Limitation and Conclusion | Findings are summarized correctly. Conclusions drawn are appropriate for analyses with adequate recommendation included | Hypotheses are clearly stated, but some concluding statements not be supported by data or data not well integrated | Some hypotheses missing or misstated; conclusions not supported by data | Conclusions do not match hypotheses and not supported by results |  |
| Report Writing | Report meets all the requirements and is prepared in original and creative way to engage readers. Referencing is correct and sufficient | Writing is clear and easy to understand; ideas are connected; referencing is correct | Most of the required criteria are met, but some lack of clarity; referencing is insufficient | Required criteria are not met with very little to no proper referencing |  |
| Comments: |  | | | Total Marks  (Out of 20): |  |