Research Note :

Virtual softlab for diode characteristic

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Software for conduct of study of experimentations in Diode characteristics has been developed which helps students to perform experiment. One can input any voltage with the helps of virtual voltmeter and its equivalent current obtained in the virtual Ammeter. A Diode characteristic curve is automatically drawn visually on the screen. This will help students in understanding working of Diode characteristics. This model performs forward biased and reverses biased reading successfully.

Electronics devices and the lack of resources make us unable to perform experiments, especially when they involve sophisticated instruments. Web-based and video-based courses address the issue of teaching to some extent. Conducting joint experiments by two participating institutions and also sharing costly resources has always been a challenge. With the present day internet and computer technologies, the above limitations can no more hamper students and researchers in enhancing their skill and knowledge.

This model is capable of completing the circuit to study characteristics, compare it with the actual circuit to find out whether the constructed circuit is correct of not and then perform the experiments. This model removes all physical instruments and performs basic operation with Diode. This model provides the capability to complete the circuit using virtual instruments, test the circuit with storage system and observe different readings with voltmeter and ammeter. This model works with forward biased and reverse biased device. During this exercised you will gain virtual observations.

Tools and technology:

Visual basic is a third generation event-driven programming language and integrated development environment from Microsoft for its COM programming model. VB is also considered a relatively easy to learn and use programming language, because of its graphical features. Visual basic was derived from BASIC and enables use of graphics user interface, access to database and creation of ActiveX controls and objects. A programmer can put together the component provided with Visual Basic itself to develop an application. The language not only allows programmers to create simple GUI applications, but can also develop complex applications. Programming in VB is a combination of visually arranging Component or control on a form, specifying attributes and actions of those components. Visual basic can create executables (EXE files), ActiveX control or DLL files, but is primarily used to develop Windows applications. The beauty of this model is that it does not require the database to manage data.

Model:

We have constructed the programs in 'VB' such that all the blocks in the model can be fully visualized on the screen. This model can demonstrate the activities of Diode characteristics visually. Input based on virtual voltmeter and virtual output is observed on Ammeter. In an experiment we can provide different input values and observe output.

The diode characteristics was developed for the purpose of virtual lab as shown in Fig. 1.

The input and output are shown in Fig. 2, 3 and 4.

Development and implementations:

For developing the concepts of diode characteristics based on animation, the