

**DESIGN, DEVELOPMENT, AND CONSTRUCTION OF CHARGE  
CONTROLLER (CC) AND SOLAR HOME SYSTEM (SHS)**

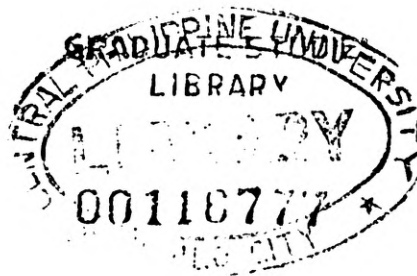
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# **DESIGN AND DEVELOPMENT OF CHARGE CONTROLLER AND SOLAR HOME SYSTEM**

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## **ABSTRACT**

The study aimed to design, develop, and construct a Charge Controller (CC) and Solar Home System (SHS) with locally made and available component. The system design consists of six components: the Photovoltaic (PV) module, Charge Controller, battery, night switch, multipurpose battery charger, and the DC load. The data gathered to test the performance of the system were the open circuit voltage of the PV module ( $V_{open}$ ), short circuit current of the PV ( $I_{short}$ ) Module, LVD, LVR, HVD, and HVR, the power dissipated by the LED lights, the Luminance of LED lights, and the charging current of the multipurpose battery charger. Results revealed that for PV module the required parameters are open circuit voltage of 19.5 V, short circuit current is 1.3 A and the measured value is 19.5 V open circuit voltage and 0.95 A short circuit current. When connected to the CC, the voltage decreased up to the battery voltage. When the HVR is 13.05 V, the orange LED turned "ON" and the red LED "OFF". When HVD is 14.32 V, the red LED turned "ON". When LVD is 11.76 V the green LED turned "ON" and yellow LED turned "OFF", when HVR is 12.76 V yellow LED turned "ON" and the green LED turned "OFF". All the parameters measured were closer to the expected value and the indicators successfully showed the precise state of charge and status of the battery voltage. This indicates that the circuit components are working properly reliable and ready for use.