

End Semester Practical Examinations - Nov / Dec 2025

Department of Electronics and Communication Engineering

B.E-Industrial Electronics Application

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ABSTRACT

The rapid growth in electrical energy consumption and the lack of efficient load management systems have resulted in increased power wastage and safety concerns in residential and industrial sectors. To overcome these issues, this project titled “Intelligent Management and Control of Electrical Loads Using a Microcontroller” presents an automated and reliable system for effective monitoring and control of electrical loads. The proposed system uses a microcontroller as the central processing unit to intelligently manage multiple electrical loads based on predefined conditions and operational requirements.

The system consists of sensors for monitoring electrical parameters, a microcontroller for decision-making, relay modules for load switching, and a display or monitoring interface for user interaction. It continuously observes the load conditions and automatically controls the connected devices to prevent overload, short-circuit conditions, and excessive power consumption. Priority-based load control ensures that essential loads remain active while non-essential loads are disconnected during critical situations.

By minimizing manual intervention and enabling real-time control, the system enhances electrical safety, improves energy efficiency, and reduces operational costs. The developed solution is cost-effective, scalable, and easy to implement, making it suitable for smart homes, commercial buildings, and small-scale industrial applications. This project contributes to sustainable energy utilization and promotes intelligent electrical load management using modern embedded system technology.