Techtronix 2024

Committee:Circuits and Modelling

Theme:To find the solution to the technical problems in our society by using basic circuital elements such as resistor, capacitor,transistors.

Rules:1) It should be eco friendly.

2)It should be economical.

3)The circuit should be made by the materials which are readily available.

4)It should be made from elements such as resistors, capacitors.

5)No microprocessors or other fancy circuits should be used.

6)It should be easy to use.

7)It should be beneficial to the society.

Problem Statements: 1) Emergency alert on mobile phones. Suppose you are in a situation where the vehicle you are traveling in breaks down with no help in sight or you anticipate danger to your life or you have a medical emergency. There should be one button on your phone, which upon being pressed sends out an alert message to the police station, hospital or fire station. No need to search and click a number, just press the button and it goes to saved numbers.Likewise, you can send a message to a group of selected friends at the click of a button. It can bring help immediately.

2)Develop a security system using PIR sensors and analog circuits to detect motion and trigger alarms without the need for a microcontroller.

3)Design a parking sensor system using ultrasonic sensors and analog circuits to detect obstacles and provide audio or visual feedback to drivers.

4)Temperature controlled fan

5)Colpitts oscillator

6)MOSFET h bridge motor driver

7)Transistor radio receiver

8)Photovoltaic solar tracker

9)Voltage control oscillator

10)Fm radio jammer

11)Transistor based water level indicator

12)Transistor based fire alarm

13)Household Gas leakage detection from LPG cylinders

14)Microplastic detection in water . We can do that by using some kind of light sensor which would check intensity of light. We can run water through a transparent pipe and use light source from one side of pipe and a light sensor to the another side. If the intensity of light at sensor is less, then we can conclude that there is some impurities present.

15)Non lethal portable weapon (by using high voltage). Here we can use transformer to step up battery voltage. This high voltage will act for few seconds. Since it is portable one can carry easily.

16)Prevention of mosquitoes and insects using ultrasonic frequencies.

17)Address the problem of slow decomposition of organic waste in landfills by promoting biodegradation.Create a system that accelerates organic waste decomposition.

18)Address concerns related to noise pollution in urban settings and promote awareness.Create a noise level monitoring system using sound sensors and analog circuits to trigger visual or audible alerts when predefined noise thresholds are exceeded.

19)Design a system to efficiently integrate renewable energy sources into existing power grids, addressing challenges related to intermittency and grid stability.

20)Develop a low-cost hearing aid using analog circuitry to amplify and filter sound based on the user's hearing needs.

21)Design a flat platform, on which a bottle containing fluid can be kept. It should have a circuit system displaying the water volume (ml) left in the bottle. The weight of the empty bottle is to be fed in the setting phase by keeping the bottle on the platform. The density of fluid should be pre-defined.

22)Display ambient temperature and control the fan speed according to the temperature data.

23)Design a socket with an accompanying circuit showing the power drawn by any device plugged into it, on a seven-segment display.

24)Design a contactless calling bell, that can be triggered from a distance as far as 6 feet. It should be robust to false alarms.

25)Design a wearable system for a cyclist, that detects and indicates acceleration, braking and turning of the cycle.