Department of Electrical & Electronics Engineering

ROYAL COLLEGE OF ENGINEERING & TECHNOLOGY,

Akkikavu, Thrissur – 680604

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Bonafide Certificate

This is to certify that the project report entitled **"SOLAR POWERED DC AIR CONDITIONER"**, is a bonafide record of work carried out by **ABHIJITH P K (REAOEEE001), STERLIN P S (REAOEEE032), SURAJJITH (REAOEEE034), VISHNU MADHAVAN (REAOEEE037), ASWANI M (REAOEEE050)** of Eighth Semester Electrical & Electronics Engineering (2014 admissions) of Royal College of Engineering and Technology, as a requirement for the award of Degree of Bachelor of Technology in Electrical & Electronics Engineering of University of Calicut during the academic year 2017-2018. The project has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

Project Guide	**Project-Coordinator**	**Head of Department**
Ms. Able Alex	Mr. Kiran P	Ms. Amrutha M Chemmanur
Asst. Prof. EEE	Asst. Prof. EEE	HOD of EEE

Date : 27/3/18.

Place : Akkikavu

ABSTRACT

Solar electric power is an energy source that is clearer, more reliable, long lasting and environmentally friendlier than nuclear, oil, coal or other fuel-based solutions. It reduces greenhouse gas emissions, air pollution and other causes which change climatic conditions.This, in turn, increases the quality of life such as better respiratory health, decreased work or school absenteeism from smog-related asthma.So in our project a DC powered solar air conditioner is proposed. The solar air conditioner can save 80 percent of electric bills.The DC powered solar air conditioners use less than half number of solar panels that are used in the conventional solar inverter type air conditioner.In this project, an air conditioner is developed which is working on DC and consists of BLDC motors with evaporative cooling technology. Here water is used as a refrigerant and it is cooled using evaporative cooling.This cold water is pumped using motors into a five-layered container in which this temperature is retained for a long time.This cold water is circulated through copper tubes which absorb the heat in the room. This whole system is powered by solar energy and the trapped energy is made more efficient using the charge controller. In charge controller, maximum power point algorithm is used and energy is stored in the battery which can be given as power for the air conditioner.Elimination of conventional inverter system will save more energy and this system can also run in alternating current supply. The proposed system is perfect for residential as well as commercial purpose where conventional methods are costly and unreliable.

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This is to certify that the interim project report entitled "**FARMSTEADER**", is a bonafide record of work carried out by **FASEENA P K** (REAOEEE010), **FISMA M H**(REAOEEE012), **HADIL P P** (REAOEEE014),**LAKSHMI DEVI T** (REAOEEE016), and **MUHAMMED AJMAL M K**(REAOEEE020) of Eighth Semester Electrical and Electronics Engineering (2014 admissions) of Royal College of Engineering and Technology, as a requirement for the award of Degree of Bachelor of Technology in Electrical and Electronics Engineering of University of Calicut during the academic year 2017-2018. The project has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

Project Guide	**Project-Coordinator**	**Head of Department**
Ms ANJU SAM	Mr. KIRAN P	Ms AMRUTHA M CHEMANNUR
Asst.Prof,EEE	Asst.Prof,EEE	HOD,EEE

Date: 27/11/17
Place: RCET

ABSTRACT

In the present day, where consumption of food is more than production, there is a need to inco-operate various methods of seeding, irrigation ,weeding , and complete automation so as to get high yield.The faster technological advancement have helped in improving the quality of farming but yet those machines are larger in size and expensive too. Thus came the need for a farmer friendly robot which work in a way such that it analyses the weather and soil moisture etc. This technology helps in merging all the needs and coordination between the systems . It helps in interconnecting different blocks , analysing data and necessary commands to different sections. This mechanism uses solar energy for its working which is produced using solar cells erected near the field area. The same energy is used for irrigation purpose

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This is to certify that the interim report entitled **"SOLAR AIR CONDITIONING SYSTEM IN CARS WHILE PARKING"**, is a bonafide record of work carried out by **MOHAMMED SHAFI C (REAOEEE018), ANAS K (REAOEEE040), IMTHYAS K K (REAOEEE041), MUKTHAR NAZER P V (REAOEEE045), VISHNU SURENDRAN (REAOEEE050)** of Eighth Semester Electrical & Electronics Engineering (2014 admissions) of Royal College of Engineering and Technology, as a requirement for the award of Degree of Bachelor of Technology in Electrical & Electronics Engineering of University of Calicut during the academic year 2017-2018. The project has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

Project Guide	**Project-Coordinator**	**Head of Department**
Mr. Praveen K P	Mr. Kiran P	Ms. Amrutha M Chemmanur
Asst. Prof. EEE	Asst. Prof. EEE	HOD of EEE

Date : 31/1/18

Place : Akkikavu

ABSTRACT

This project describes the design and implementation of a car cooling system. During the summer times, for cars parked outside, the interior temperature can become very high causing discomfort for the driver and passengers. Therefore a device is needed to keep the vehicle interior at comfortable temperatures while standing on the parking lot or on the driveway .The goal of this project was to build a light weight compact car cooler. The car cooling system allows car users to maintain a reasonable temperature while sitting at home or in a parking lot. The designed system can fit in a back window. The system runs using a 12V DC power source powered through a solar panel that is mounted on the back window of the vehicle. This location was chosen because the exposure to light is greater in the rear and allows the solar panel to recharge faster and more efficiently. All components used in this system are rated 12V DC, with the exception of the microcontroller; an additional 5V DC regulator is used to power the Arduino microcontroller. Using a thermistor, the microcontroller tracks the temperature inside a vehicle. When a high temperature (i.e. temp > 70°F) condition is detected by the thermistor, the microcontroller will enable a power relay to apply power to both the fan and the cooling element .This process continues until the temperature is within the specified range (i.e. 66°F ~ 70°F) or until user disables the system.

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This is to certify that the project report entitled **"CSP BASED POWER GENERATION & APPLICATION IN REMOTE AREAS"**, is a bonafide record of work carried out by **ARYA TS (REAOEEE007), MUHAMMED AFEEF A (REAOEEE023), MUZAMIL N K (REAOEEE025), RESHMA P K (REAOEEE028), VIJESH M (REAOEEE036)**of Eighth Semester Elecrical & Electronics Engineering (2014 scheme) of Royal College of Engineering and Technology, as a requirement for the award of Degree of Bachelor of Technology in Elecrical & Electronics Engineering of University of Calicut during the academic year 2017-2018. The project has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

Project Guide	**Project-Coordinator**	**Head of Department**
Ms.Amrutha M Chemmanur	Mr.Kiran P	Ms.Amrutha M Chemmanur
HOD of EEE	Asst.prof,EEE	HOD of EEE

Date: 31/1/18
Place: RCET

Abstract

CSP BASED POWER GENERATION & APPLICATION IN REMOTE AREAS

Constructing a power generator using CSP with an added advantage of sea water purification in shipyards may provide a better alternative for energy crisis. Concentrating solar power is a promising technology for power generation in which the solar radiations is concentrated to generate high temperature for producing steam in thermal power plants. The main part of CSP is mirrors to reflect irradiation and through this technique can made direct ac current. The application of CSP is a return to traditional power plants with advanced systems. And this method may allow more efficient power generation. It can be pointed that CSP based power generation is a non-carbon emitting power generation. So that it is a non -polluting method. The method and principle behind CSP is simple and it can potentially displace the use of fossil fuel plants, which emit greenhouse gases which cause climate change. Making a hybrid CSP with thermal power plant may help the society for better electricity production. In this project, there are parabolic or heliostat mirrors as reflectors of solar radiations. The collection of solar energy is based on the MPPT (Maximum Power Point Tracking) technique which is an automatic control algorithm to adjust the power interfaces and achieve the greatest possible power harvest during moment to moment variation of light level, shading, temperature, etc. The concentrated power may convert the collected sea water into steam in the boiler. Then passing the steam into the steam turbine will generate electricity. The steam from turbine then passed through the condenser and filters may give desalinated water. This hybrid option for electricity generation along with water desalination may help the society to make a better step.

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This is to certify that the project report entitled **"HYBRID RENEWABLE AGRICULTURAL HIGH VOLTAGE FENCING SYSTEM"**, is a bonafide record of work carried out by **EVELIN FRANCIS** (REAOEEE009), **STEPHY T RAPHY** (REAOEEE031), **SUAAD M IQUBAL** (REAOEEE033), **THUSHAR CHANDRAHAS** (REAOEEE035), **VISHNU SHAJI** (REAOEEE049) of Eighth Semester Electrical and Electronics Engineering (2014 scheme) of Royal College of Engineering and Technology, as a requirement for the award of Degree of Bachelor of Technology in Electrical and Electronics Engineering of University of Calicut during the academic year 2017-2018. The project has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

Project Guide	**Project-Coordinator**	**Head of Department**
Ms. Rehana A. M	Mr. Kiran P	Mrs. Amrutha M Chemmannur
AP, EEE	AP, EEE	HOD, EEE

Date: 26/3/18
Place: Akkikavu

ABSTRACT

Hybrid renewable agricultural high voltage fencing system is a new technology which aims in protecting our fields from animals and other threats. Here solar energy is used to provide the supply which is free from environmental pollutions. At the present stage the supply to this fencing system is provided using a 3 phase supply or by a direct supply. The high voltage electric supply continuously flows through the system which may even cause death to both animals and humans. This system does not provide any safety for them. Instead of providing continuous supply through the system, we are giving high voltage electric pulses of 9 KV at regular intervals and this high voltage pulse is produced using a new equipment called Power Tech. The high voltage pulse is produced from a 12 V single phase supply. The solar power from the panel is stored in a battery of 12 V capacity and passed to the Power Tech. The 9 KV high voltage pulse is directly connected to the fencing system. The electric pulse is generated using a oscillator. The duration of the pulse will be 1 milli second and for the next 1 sec pulses will not be generated. Due to this animals and humans will be thrown away, hence providing safety for them.

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This is to certify that the project report entitled **"WARFIELD ROVER USING ROCKER-BOGIE"**, is a bonafide record of work carried out by **MOHAMMED THESLIMO (REAOEEE022), MUHAMMED SALMAN P A (REAOEEE024), MOHAMED RIYAS PAPPALI (REAOEEE042), MUHAMMED ANSIL M (REAOEEE044), SAJITH P (REAOEEE046),** of Eighth Semester Electrical and Electronics Engineering (2014 scheme) of Royal College of Engineering and Technology, as a requirement for the award of Degree of Bachelor of Technology in Electrical and Electronics Engineering of University of Calicut during the academic year 2017-2018. The project has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

Project Guide	**Project-Coordinator**	**Head of Department**
Mr. V K Haridas	Mr. Kiran P	Mrs. Amrutha M Chemmanur
Asst. Prof. EEE	Asst. Prof. EEE	HOD, EEE

Date: 26/3/18
Place : Akkikavu

ABSTRACT

The rocker-bogie suspension mechanism it's currently NASA's favored design for wheeled mobile robots, mainly because it has robust capabilities to deal with Obstacles and because it uniformly distributes the payload over its 6 wheels at all times. Even though it has many advantages when dealing with obstacles, there is one Major shortcoming which is its low average speed of operation, making the rocker bogie System not suitable for situations where high-speed traversal over hard-flat Surfaces is needed to cover large areas in short periods of time, mainly due to stability problems. The Rocker-Bogie Mobility system was designed to be used at slow speeds. It is capable of overcoming obstacles that are on the order of the size of a wheel. However, when surmounting a sizable obstacle, the vehicles motion effectively stops while the front wheel climbs the obstacle. When operating at low speed (greater than10cm/second), dynamic shocks are minimized when this happens. We will develop a method of driving a rocker-bogie vehicle so that it can effectively step over most obstacles rather than impacting and climbing over them. Most of the benefits of this method can be achieved without any mechanical modification to existing designs. In addition we are providing a live streaming facility to understand the surroundings condition and also provide a metal detector to detect the mines buried in soil. The thermometer checks the surrounding temperature.

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This is to certify that the project report entitled **"NEW GENERATION ENERGY METER"**, is a bonafide record of work carried out by **AJITH.C (REAOEEE002), ASIF ALI PV (REAOEEE008), FAZIL K (REAOEEE011), MOHAMMED AFEEF ABID (REAOEEE019), SARATH KRISHNAN C V (REAOEEE047)** of Eighth Semester Electrical & Electronics Engineering (2014 admissions) of Royal College of Engineering and Technology, as a requirement for the award of Degree of Bachelor of Technology in Electrical & Electronics Engineering of University of Calicut during the academic year 2017-2018. The project has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

Project Guide	**Project-Coordinator**	**Head of Department**
Ms. Anu M Asst. Prof. EEE	Mr. Kiran P Asst. Prof. EEE	Mrs. Amrutha M Chemmanur HOD, EEE

Date: 26/3/18
Place : Akkikavu

ABSTRACT

The proposed energy meter not only displays energy consumption in the connected load but also enables user to effectively manage power in an easy way. This system is intended to use in single phase, two wire distribution systems. Total load is divided into three lines and monitors current in each lines. LCD display is used to show energy consumption in kilowatt hour, voltage and current in separate loads. User can set maximum allowed current for each line. This value is continuously compares with current to identify overload conditions and if it detects any such overload conditions then switches off power to that load. Besides a real time clock is also included in the system to keep track of time. User can set maximum energy allowed for a month. If consumption reaches the limit, the system will cut off a line which is fixed as low priority line. Extra power save option is provided by which user can select a line which will be active in night only. The main chips used for the system are PIC microcontroller (PIC16F877A), ADE 7757 and PCF 8583. Programmed software in the Microcontroller controls all the functions. ADE 7757 serves as a metering chip and PCF 8583 is for Real Time Clock function. Keyboard, LCD and led indicators are used for making the system easy to handle. In additional we are using raspberry pi module for custom android application.

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This is to certify that the project report entitled **REMOTE CONTROLLED RIVER WASTE COLLECTOR",** is a bonafide record of work carried out by **ARJUN ARAVIND T (REAOEEE006), MOHAMED SHABEER P (REAOEEE017), RISHAN BACKER (REAOEEE029), ABDUL ASEES K V (REAOEEE039), VINIL V (REAOEEE048)** of Eighth Semester Electrical & Electronics Engineering (2014 admissions) of Royal College of Engineering and Technology, as a requirement for the award of Degree of Bachelor of Technology in Electrical & Electronics Engineering of University of Calicut during the academic year 2017-2018. The project has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

Project Guide	**Project-Coordinator**	**Head of Department**
Mr. Sanjith Mohan	Mr. Kiran P	Ms. Amrutha M Chemmanur
Asst. Prof. EEE	Asst. Prof. EEE	HOD of EEE

Date : 26/3/18

Place : Akkikavu

ABSTRACT

The motive of the project is to automate the waste cleaning process in drainage, to reduce the spreading of diseases to human. The black water cleaning process helps to prevent pest infestations by reducing the residues that can attract and support pests. It also improves the shelf life and sensory quality of food products. In the proposed system, the machine is operated with remote control to clean the waste. Water gets polluted due to many reasons such as waste from industry, garbage waste, sewage waste etc. water from lakes and ponds are cleaned by traditional methods. We have to incorporate technology such that cleaning work is done efficiently and effectively. We consider this as a serious problem and start to work on the project. We collected information from the various resource, based on the details collected we listed objectives that a design has to carry.

Various concepts were generated through Pugh evaluation chart. Design calculation was being done where theoretical values of required parameters were calculated to match them with actual values achieved by the solution.

Hence, this system avoids the impacts from the sewage waste and its harmful gases.This helps to prevent the mosquito generation from the wastage.The process starts collecting the sewage wastes by using the conveyer belt and it throws back the waste into the bin fixed in the machine at the bottom. A conveyer belt is used to lift the sewage and in turn a bucket is used to collect them. In this system we are also using a solar panel for recharging the battery. Hence which can be useful running at day time. By this the battery of the system will be recharged when a certain amount of sunlight reached to the solar system. The garbage which affects the drainage is also picked up and removed. This system has limited human intervention in the process of cleaning and in turn reduces spreading of diseases to mankind.

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This is to certify that the project report entitled "**SOLAR BASED ROBOTIC LAWN MOWER**", is a bonafide record of work carried out by **AMAL SREENIVAS(REAOEEE004), MUHAMMED RAHEES PH(REAOEEE021),NAHAS GAFOOR M A(REAOEEE026), SADHIQUE MOHAMMED K V(REAOEEE030),VISHNU RAJ A(REAOEEE038)** of Eighth Semester Elecrical & Electronics Engineering (2014 Scheme) of Royal College of Engineering and Technology, as arequirement for the award of Degree of Bachelor of Technology in Elecrical & Electronics Engineering of University of Calicut during the academic year 2017-2018. The project has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

Project Guide	**Project-Coordinator**	**Head of Department**
Ms.Neethu K .S	Mr.Kiran P	Ms.Amrutha M Chemmanur
Asst.prof,EEE	Asst.prof,EEE	HOD Of EEE

Date: 26/03/18
Place: RCET

Abstract

SOLAR BASED ROBOTIC LAWN MOWER

Solar powered lawn mower can be described as the application of solar energy to power an electric motor which in turn rotates a blade which does the mowing of a lawn. Different designs have been made, each to suit a particular need or convenience. Making the process of cutting grass easier over the years, many individuals have added modification to the original design speed, efficiency and power of a mowing machine. The solar powered lawn mower is an improvement on cordless electric lawnmower. The sun provides sustainable amount of the energy used for various purposes on earth for atmospheric system.The solar powered lawn mower is based on the same principle that other early inventions of lawn mowers works on. The difference is just the application of the energy source. It uses the photovoltaic panel to generate the energy needed to power the mower. It is assumed that a lawnmower using solar as the energy source will address a number of issues that the standard internal combustion engine and electric motors lawn mowers do not. A lawnmower with solar energy will be easier to use, it eliminates down time by frequent trips to the gas station for fill-ups and danger associated with gasoline spillage. The dangerous emissions generated by the gasoline spillage and that of the internal combustion engine into the atmosphere are eliminated. The solar powered lawnmower will help to reduce air pollution as well as noise pollution produced by other types of lawn mowers. In addition, it will help to reduce the running cost of using and maintaining a lawnmower.