



# PANDIAN SARASWATHI YADAV ENGINEERING COLLEGE

(Approved by AICTE & Affiliated to Anna University, Chennai)

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## Number of Mechanical Engineering Student Undertaking Main Projects during the Academic Year 2022-23

### Programme Name & Code: Mechanical Engineering & 114

Sl. No	Register Number	Name of the Students	Project Title
1	912019114001	Ahamed Masthan S	Fabrication of E- Tri Cycle
2	912019114014	Kaviyarasan A	
3	912019114016	Mohanasundaram M	
4	912019114002	Anandhanathan K	Design and Fabrication of Vegetable Cutting Machine
5	912019114010	Haribala R	
6	912019114018	Muthaiah M	
7	912019114003	Ananthkumar M	Design and Fabrication of Multi-Purpose Agriculture Machine
8	912019114011	Jayaram S	
9	912019114015	Mohamed Ashik A	
10	912019114005	Ari Krishnan K	Design and Fabrication of Hydraulic Forklift
11	912019114021	Ramanathan R	
12	912019114024	Sundarapandi A	
13	912019114006	Ayyanar K	Mechanical behaviour of Natural fibers reinforced Polymer Bio-Composite
14	912019114019	Nandha Kumar M	
15	912019114023	Ranjithkumar V	
16	912019114007	Dhivya Bharath R	Design and Fabrication of Smart Hencage
17	912019114009	Gurumoorthi R	
18	912019114017	Murugesan R	
19	912019114020	Pradeep S	Mechanical behaviour of Banana fiber reinforced Composites
20	912019114008	Gourishankar P	
21	912019114012	Karthick E	Design and Fabrication of Solar Manual Grass cutter and Grass collector using Slotted Crank Mechanism
22	912019114013	Karthik Raja R	
23	912019114022	Ramsubramanian R	
24	912019114026	Vignesh P	Analysis and Design of Electric Tricycle
25	912019114301	Balaji R	
26	912019114302	Nirmal Kumaran T	

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FABRICATION OF E- TRICYCLE

A PROJECT REPORT

*Submitted by*

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M. MOHANASUNDARAM

912019114016

*In partial fulfillment for the award of the*

*degree of*

BACHELOR OF ENGINEERING

IN

MECHANICAL ENGINEERING



PANDIAN SARASWATHI YADAV ENGINEERING COLLEGE

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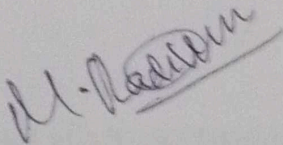
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Certified that this project report title " FABRICATION OF E - TRICYCLE" is the bonfide work of " AHAMED MASTHAN S (912019114001), KAVIYARASAN A (912019114014), MOHANASUNDARAM M (912019114016)" who carried out this project under my supervision.

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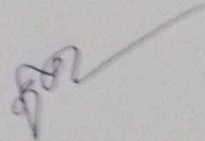
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Submitted for the Project Viva-Voce Examination held on...16.05.2023...

INTERNAL EXAMINER

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## ABSTRACT

The paper analyses the design of an electric solar powered tricycle for use as a commercial means of transportation. The tricycle uses an electric brushless direct current motor connected to the rear wheels of the tricycle using the chain and sprocket mechanism. This motor is powered by direct current from the battery bank. The battery bank is charged via a solar PV system directly installed on the roof of the tricycle. This enables the panel to charge the battery bank while the tricycle is in motion. The tricycle also employs the regenerative braking system which also charges the battery every time the brake is initiated. If effectively deployed, an estimated 32 tonnes of CO<sub>2</sub> emissions is calculated to be the CO<sub>2</sub> savings effected by this energy system annually. Conclusively, this paper addresses the need to provide a sustainable and affordable solution to commercial passenger transportation in developing countries of the world.

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## CONCLUSION

The electric tricycle as compared the conventional petrol powered tricycles gives you a cost savings of over three hundred thousand naira on running cost as against the petrol powered which is almost enough to purchase another electric tricycle which means good business for the entrepreneur. It also has a carbon savings of 32tonnes against the conventional tricycle which makes it absolutely a better option if intelligent steps are to be taken to combat global warming. Safety in automobiles is a very integral part, so the Design was done in such a way the driver does not speed beyond the set limits of 30Km/hr and this helps minimize the hazards that accompany over speeding and it's also helps the brake to be fully initiated at any instance in time.

# DESIGN AND FABRICATION OF VEGETABLE CUTTING MACHINE

A PROJECT REPORT

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**M.MUTHAIAH** (912019114018)

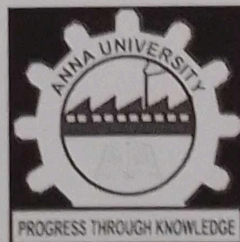
In partial fulfilment for the award of the degree

Of

BACHELOR OF ENGINEERING

IN

MECHANICAL ENGINEERING



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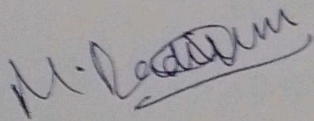
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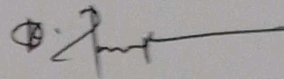
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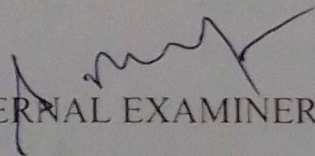
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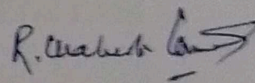
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INTERNAL EXAMINER



EXTERNAL EXAMINER

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## ABSTRACT

Nowadays, human life becomes more competitive and faster than the previous. The technology has saved human effort and time to a large extent. Slicing vegetables are a risky and time-consuming task in our busy life. This project is aimed at solving above stated problems by introducing a special product named Vegetable cutting machine. Its mainly designed to reduce human effort and make the job of cutting vegetables much easier and faster. Its main features are, easily portable, less power consumption and changeable stainless, sharp blade, etc. This product is designed and established by following a structured product design process and with the help of a board of design engineers. Product planning, customer needs identifying, product specification, concept screening, concept scoring and bill of materials are tools that mainly used to accomplish this task. Finally, this paper also suggests various techniques and opportunities of product planning in manufacturing industries as future recommendations. the engineering sector, The examination into the present vegetable cutting machine looks at the disadvantages of manual processing, such as the high investment cost, contamination, additional labour, and time consumption. the era of industrialization, machines become an integral part of human life. These machines help to reduce the time needed to do a specific task.



## CHAPTER-16

### CONCLUSION

Thus, we have come up with a low-cost automatic vegetable cutting machine. We have been able to design and develop an automatic vegetable cutting machine for different objectives using simple mechanisms. In this paper the attempt made for designing and manufacturing of semi-automatic paper bag making machine was successful.

As a result, this study offers an alternative to the current automatic vegetable cutter in terms of automating the vegetable entry into the cutting equipment, eliminating power fluctuations, and requiring a lower initial investment. When compared to manual cutting, it takes less time. This job produces the required result, and the variety of cuts is achieved by the employment of several cutting grid.

DESIGN AND FABRICATION OF MULTIPURPOSE  
AGRICULTURE MACHINE  
A PROJECT REPORT

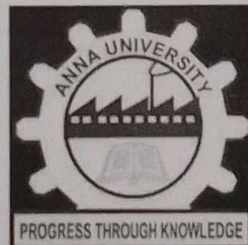
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**A MOHAMED ASHIK (912019114015)**

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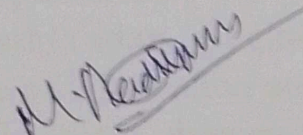
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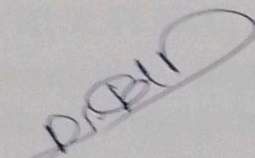
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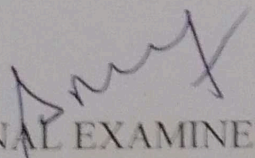
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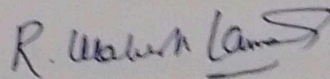
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Submitted for the "VIVA-VOCE" held on. 16/05/23..

INTERNAL EXAMINER



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## ABSTRACT

Farming is the backbone of Indian economy. In this agriculture sector, there is a lot of fieldwork, such as ploughing, reaping, sowing etc. these operations previously were done by traditional equipment's. This field faces some problems such as how to minimize the losses, how to increase productivity and how to minimize cost. In India, two types of agricultural methods are used, manual method (conventional method) and mechanize type method. In Manual method they are working with those equipment's was tedious and laborious. Also traditional ways are time consuming. Mechanization involves the use of a hybrid device between the power source and the work. This hybrid device usually transfers motion, such as rotary to linear, or provides sample of mechanical advantages. Mechanization in agriculture made farming easier and quick. There are variety of machines are available for almost every task in agriculture. Beginning with preparing land to the harvesting of crop and further process can be done by machines. This machines not only easier way to do this task but also very efficient. The agriculture machineries that are used now days are costlier and cannot be afforded by most of farmer with rural background

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## CONCLUSION

After the designing and analysis of the "Multipurpose Agricultural Machine" conclusion which we made are as follows:

Based on the overall performance of the machine we can definitely say that the project will satisfy the need of small scale farmer, because they are not able to purchase costly agricultural equipment.

The machine required less man power and less time compared to traditional methods, so if we manufacture it on a large scale its cost gets significantly reduce and we hope this will satisfy the partial thrust of Indian agriculture. So in this way we solve the labour problem that is the need of today's farming in India. Unique machine designed to carry out the task of spraying the fertilizers and sowing of seeds is developed. The complete calculations along with the software model are presented in this paper. It overcomes the problem associated with conventional spray such as back pain due to weight carried on back on person.

This is a handy machine which will be helpful to improve the performance during farming operations. The device is made such that can be easily operated in field. The vehicle power is provided by two stroke petrol engine, and controls are given at handles. The steering mechanism is easier to operate and simple. Equipment controls are handy and easily accessible. The control switch is provided for spraying operations. Thus, this fabrication is value for money.

DESIGN AND FABRICATION OF HYDRAULIC  
FORKLIFT

A PROJECT REPORT

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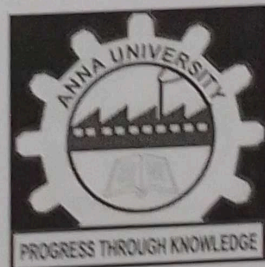
In partial fulfilment for the award of the degree

Of

BACHELOR OF ENGINEERING

IN

MECHANICAL ENGINEERING



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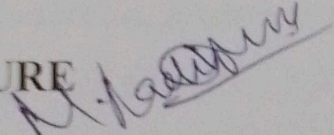
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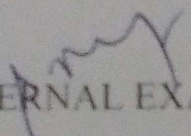
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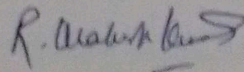
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## ABSTRACT

The fabrication of a hydraulic forklift involves designing and building a hydraulic system that can lift and move heavy loads. The hydraulic forklift is a type of material handling equipment used to lift and move materials in warehouses, manufacturing plants, and other industrial settings. The fabrication process typically involves designing and engineering the hydraulic system, selecting the appropriate hydraulic components, and constructing the frame of the forklift using durable materials. The hydraulic system includes a pump, cylinder, valves, and hoses that work together to create the force necessary to lift heavy loads. The frame is typically constructed using steel or other durable materials that can withstand the weight of the load.

Once the hydraulic system and frame are constructed, the forklift can be assembled and tested. The hydraulic forklift can be operated by a trained operator who uses the controls to lift and move heavy loads. Overall, the fabrication of a hydraulic forklift is a complex process that requires careful planning, engineering, and construction to ensure the equipment is safe, reliable, and effective in handling.

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## CHAPTER-8

### CONCLUSION

Project work "3 WHEEL DRIVE FORKLIFT FOR INDUSTRIAL WAREHOUSE" is aimed to elevate the load with the assistance of hydraulic jack. the most blessings of exploitation this can be to simply handle significant load by solely pressing the jack. It will increase the productivity because of no external supply like battery or wire is hooked up. The system is meant & developed with success, for the demonstration purpose paradigm model (mini model) is built & the result's satisfactory.

After collection the go back numerous journal we tend still as analysis paper there's great deal of electricity is wasted by elevating a load or significant material thus we came to conclusion that manual hydraulic lift is that the solely thanks to stop such industrial issue like ability operator solely will operate don't seem to be needed, significant load handling and therefore the main advantage of this self-propelled vehicle is most effective, low cost & increase productivity. Most of all the electricity saving could be a major concern by exploitation hydraulic jack self-propelled vehicle. we will use human brain similarly as hands & legs & operate a self-propelled vehicle and thereby nullifying the possibilities of accident. Our project options a simple electrical heart and a simple mechanical body. As this could

# MECHANICAL BEHAVIOUR OF NATURAL FIBERS REINFORCED POLYMER BIO – COMPOSITES

A PROJECT REPORT

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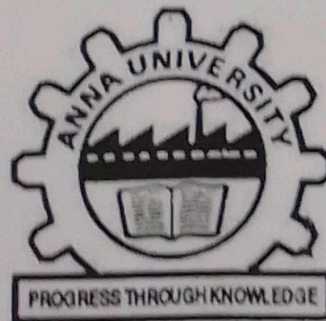
*In partial fulfilment for the award of the degree*

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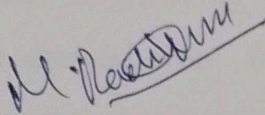
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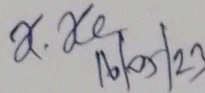
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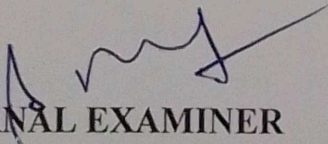
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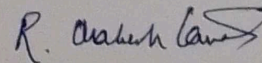
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The Viva-Voce examination held on 16. 05. 2023

INTERNAL EXAMINER



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## ABSTRACT

Fibre-reinforced polymer composites have played a dominant role for a long time in a variety of applications for their high specific strength and modulus. The fibre which serves as a reinforcement in reinforced polymer is in the form of natural fibres. In this connection, an investigation has been carried out to make use of coir fibre which is available abundantly in India. Natural fibres are not only strong and lightweight but also relatively very cheap. The present work describes the mechanical properties of a new set of research was carried out by reinforcing the matrix (polyester resin) with natural material (coir and feather fibre). The newly developed composites are characterized with respect to their mechanical characteristics. Samples of composite laminate were manufactured using hand layup method. Specimens were cut from the fabricated laminate according to the ASTM standards for different experiments. For Tensile test, samples were cut in the desired shape. Tensile Strength was observed and compared to each other. The CFF-Coir-Glass fiber composites have more tensile strength than other composites can withstand the tensile strength of 42.54 MPa. The study shows the tensile property of Plant and animal-based composites exhibit a higher value than the individual composites.

## CHAPTER 5

### CONCLUSION

Due to various environmental concerns natural fibre has been gaining special attention of technologist, engineers, industrial and manufacture for its enormous potential for application in different engineering utility in the area of building construction, railway, automotive, packaging, defence etc. These natural fibres have been in use as reinforcing agent in polymeric, cement, matrix to increase the physical, mechanical/engineering properties. Plant, animal and asbestos fibre are the main class of natural fibres which are extensively used in product development and manufacturing. Among them, plant fibres percentage use is much higher than the animal and asbestos fibres, due to its renewability, recyclability, availability, environment friendliness. Utilization of animal fibre in composite making is an emerging area, because waste animal fibre can be utilized in useful technical application, whereas asbestos fibre has attractive mechanical, thermal, acoustic properties which can enhance its use in engineering application. But due to its carcinogenic nature many developed and developing country prohibited its use because this causes various types of diseases. So, researchers are eager to develop alternative to traditional asbestos reinforced composite materials. The following conclusions have been derived from the experimental conduction The CFF-Coir-Glass fiber composites have more tensile strength than other composites can withstand the tensile strength of 42.54 MPa. The study shows the tensile property of Plant and animal-based composites exhibit a higher value than the individual composites.

So, from the above results and discussions Chicken feather fibre and Coir Plant and animal-based composites can be used as an alternative material for synthetic fibre reinforced composite materials.

# DESIGN AND FABRICATION OF SMART HEN CAGE

A PROJECT REPORT

*Submitted by*

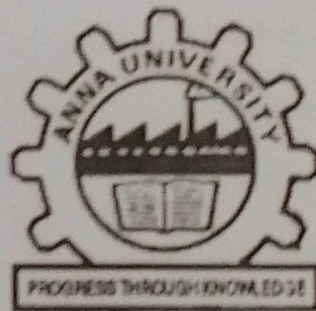
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## BONAFIDE CERTIFICATE

Certified that this project report title "DESIGN AND FABRICATION OF SMART HEN CAGE" is the bonafide work of "R.DIVYA BHARATH (912019114007), R.GURUMOORTHY (912019114009), R.MURUGESAN (912019114017) who carried out the project work under my supervision during Nov 2022 to May 2023.

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Submitted for the project Viva-Voce examination held on ...16.05.2023.....

INTERNAL EXAMINAR

EXTERNAL EXAMINAR

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## ABSTRACT:

In Tamilnadu, there are more than 11 lakh broiler chickens are produce per day. Nearly 46 lakh broiler chickens were sold in a week, all over Tamilnadu. The city side peoples buy the major part of the Broiler hen's meat, these broiler hens affect our health and Cause Cancer & Male Infertility. We relocated from village to city, we used to grow hens at our Grove. We try to increase Organic hen farming and increase the rate of poultry farming through the Cities. Increase in number of City side Poultries provides a cost effective poultry meat and improves a healthy lifestyle. Customized Design suitable to place at Grove Automation in feeding system. A source of income at less Maintenance. Automatic temperature controller. Disease management guidance. Collect meat and egg from our customers.

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## CHAPTER-8

### CONCLUSION

IOT is an innovative technology for poultry farming which can be changing a manual farm into modern semi-automated poultry farm. In addition, the system could work on the android mobile application helping the owner to monitor the poultry farm such as food feeding function, object detection, water sprinkling, and unwanted gas reduction. The proposed system can reduce manpower and feed the food to chickens, reduce the unwanted gas, maintain temperature in farm this is fully automatic. Hence this system will be reducing cost, time, manpower, decreasing environment pollution.

# MECHANICAL BEHAVIOUR OF BANANA FIBRE REINFORCED COMPOSITES

A PROJECT REPORT

*Submitted by*

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S.PRADEEP (912019114020)

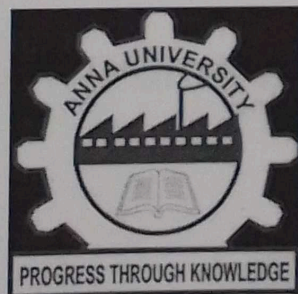
*In partial fulfilment for the award of the degree*

*Of*

BACHELOR OF ENGINEERING

IN

MECHANICAL ENGINEERING



PANDIAN SARASWATHI YADAV ENGINEERING COLLEGE

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MAY 2023

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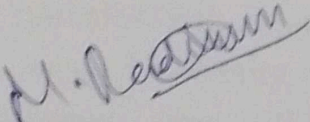
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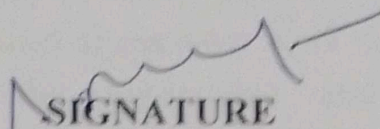
## BONAFIDE CERTIFICATE

Certified that this project report "MECHANICAL BEHAVIOUR OF BANANA REINFORCED COMPOSITES" is the Bonafide work of "P.GOWRISANGAR (912019114008) S.PRADEEP (912019114020)", who carried out the project work under my supervision



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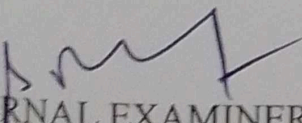
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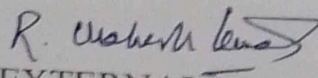
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INTERNAL EXAMINER



EXTERNAL EXAMINER

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## ABSTRACT

Polymer nanocomposites are one of the important application areas of nanotechnology, as well as naturally derived organic nano phase materials of special interest. Recent years has seen the uses of eco-friendly composites due to its light weight and moderate strength. The potential of nanocomposites in various sections of research and application is promising and attracting increasing investments. The present investigation deals with the synthesis and characterization of banana nanofibers reinforced polymer composites. In this work, nanofibers are extracted from the stem of banana tree and undergoes chemical treatment and mechanical milling process. High energy ball milling is used for preparation of nanofibers to the required dimensions.

The most important factor in finding good fiber reinforcement in the composites is the strength of adhesion between matrix polymer and fiber. Due to the presence of hydroxyl groups and other polar groups in various constituents of banana, the moisture absorption is high, which leads to poor wettability and weak interfacial bonding between fibers and the more hydrophobic matrices. Therefore, it is necessary to impart a hydrophobic nature of the fibers by suitable chemical treatments in order to develop composites with better properties.

The characterization of nanofibers is done using a Fourier Transform Infrared Spectroscopy Analysis, X-ray diffraction and Scanning Electronic Microscope and found its average particle size to be in the range of 71micrometer to 47nm. The banana nanofibers have a high potential to be used in many different areas, particularly as reinforcement in the development of nanocomposites. In the present work, banana nanofibers are reinforced in epoxy polymer in different weight percentages to fabricate nanocomposites using hand lay-up technique. The influence of

banana nanofibers reinforcing effect with an epoxy polymer on mechanical properties like tensile strength, impact strength, flexural strength, hardness and damping property of nanocomposites are investigated and ASTM standards are followed for preparing the samples. It is observed that the mechanical properties have improved when compared with that of neat composites. The maximum improvement is observed when the weight percentage of the banana nanofiber in the polymer is 4 wt.% and 6 wt.%. This is due to good dispersion of banana nanofibers in composites which reduce the stress concentration and enhances the uniformity of stress distribution.

Environmentally beneficial composites can be made by replacing synthetic fibers with various types of cellulosic fibers. In the present work, the effect of alkali treatment on the moisture absorption is investigated. In the present work, it is observed that the alkali treated banana fiber absorbs less moisture than compared to other natural fibers.

Thermal properties of banana nanofibers composites are investigated using thermo gravimetric analysis (TGA), differential scanning calorimetry (DSC) and dynamic mechanical analysis (DMA). The influence of reinforcement of nanofibers in terms of glass transition temperature, thermal stability and thermal decomposition is discussed from TGA and DSC. The crystallization rate and crystallization peaks shift lower in the thermogram with the increasing nanofibers content. The nanofibers composite plays a vital role in controlling its rate of thermal degradation.

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## CHAPTER-3

### CONCLUSIONS AND FUTURE SCOPE

#### 3.1 CONCLUSIONS

The present work investigates the performance of banana fiber polymer nanocomposites. Different parameters which affect the mechanical, thermal and water absorption properties are studied. Most of the investigations include experiments and analytical modelling. From all these investigations, it is observed that there are several common conclusions besides those remarks at the end of each chapter for the banana fiber nanocomposites.

Physical and Tensile Properties of the banana fiber nanocomposites exhibit superior advantages over the synthetic fibers especially in cost, environmental aspects and high specific modulus compared to synthetic fibers. The physical and mechanical properties of the banana fiber nanocomposites are observed. The results found good agreement within the range in the literature. The tensile strength of nanocomposites was increased from 50% to 96% with an increasing Banana nanofiber neat composite, 2, 4, 6 and 8wt. % contained. The maximum tensile strength improvement was noticed as 96% for the 4wt. % banana fiber nanocomposites, and then decreased when the content of fibers is 6wt. % and 8wt. %. The increase in tensile strength is attributed to strong interaction between the polymer and banana nanofibers. The interaction has a large impact in nanocomposites due to the large interfacial area between the nanofibers and the resin. The improvement in tensile strength appears to be promising in structural applications irrespective of the direction of the applied load. However, the drawbacks of natural fibers include wear, low shear strength and compression

limiting the potential of natural fiber composites in structural use. The drawbacks can be partially overcome by introducing chemical treatment.

The mechanical properties of fiber reinforced composites are dependent upon the stability of the interfacial region. Thus, the characterization of the interface is of great importance. Alkali treatment increases the impurities of fiber surface and increased the interface between fiber and matrix, and also decreases the fiber pullout which enhanced tensile, flexural, impact and hardness properties. Different parameters affected the mechanical properties of natural fiber composites in this investigation, namely curing process, nanofiber weight fraction and fiber treatment. SEM analysis showed that the interaction between the hybrid fibers and polymer matrix is poor such that fiber debonding, fiber pull-out, matrix fracture and fibers fracture occurred.

The experimental data of mechanical properties results was compared with mathematical predictions and found to be in good agreement with some of these models.

Effects of Water Absorption, The results of this part discussed the water absorption characteristics and environmental affects of alkali treated banana fiber nanocomposites at immersion times, and fiber weight fraction and temperature surrounding played a role in the rate of moisture uptake. The natural fiber nanocomposites were found to be dependent on the fiber length and fiber weight fraction. Thermal properties of composites and thermal stability of banana fiber reinforced polymer nanocomposites are considerably dependent on nanofiber weight fraction. The results exposed that incorporation of the nanofibers gave rise to a considerable increase of the  $E'$ ,  $T_g$  and a decrease in the  $\tan \delta$  values. The loss modulus peak gobroadened emphasizing the improved fiber/matrix adhesion. The  $T_g$  temperature shifted positively.

All the nanocomposites had a higher melting temperature compared to neat composites. The TGA curves indicate that the thermal degradation of pure epoxy composite started at 344°C and 100% degradation was noticed at 559°C.

However, with the incorporation of banana nanofibers, there was a substantial enhancement in the thermal stability of the nanocomposites with an initial degradation temperature at 370°C and final decomposition at 584°C. This indicates that a significant increase in the Banana nanofibers content of fiber reinforced composites plays an important role in controlling its rate of thermal degradation. DSC curves show that the addition of banana nanofibers increased the crystallization temperature  $T_c$  by up to 1-4°C compared to the Neat composites. This result indicates that the nucleating effect of Banana nanofibers was strengthened. The banana nanofibers played the role of a nucleating agent and facilitated crystallization due to the strong interaction between banana nanofibers and polymer resin.

The nucleating effect of banana nanofibers could also explain the increase of crystalline. The nano dispersion of the filler and its orientation in the matrix are among these factors. DMA results banana nanofiber composites indicates the storage modulus  $E'$  decreases with increasing temperature, while the loss modulus  $E''$  increases. This indicates that the increased modulus, together with a positive shift in the tan delta peak position.

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DESIGN AND FABRICATION OF SOLAR MANUAL GRASS  
CUTTER AND GRASS COLLECTOR USING SLOTTED  
CRANK MECHANISM

A PROJECT REPORT

*Submitted by*

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R.KARTHIK RAJA (912019114013)

R. RAMASUBRAMANIAN (912019114022)

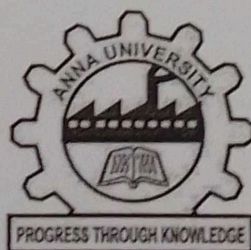
*In partial fulfilment for the award of the degree*

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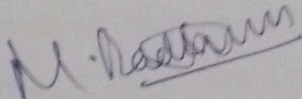
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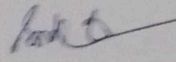
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## BONAFIDE CERTIFICATE

Certified that this project report title "DESIGN AND FABRICATION OF SOLAR MANUAL GRASS CUTTER AND GRASS COLLECTOR USING SLOTTED CRANK MECHANISM" is the bonafide work of "E.KARTHICK (912019114012), R.KARTHICK RAJA (912019114013), R. RAMASUBRAMANIAN (912019114022)" who carried out the project work under my supervision.

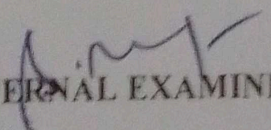
  
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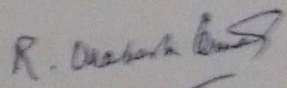
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INTERNAL EXAMINER

  
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## ABSTRACT

The goal of the project is to create a lawn cutting machine system that uses solar energy to power grass cutter and grass collector. Based on the main Principle of moving, a solar powered lawn cutter was created and build. The design of a solar powered grass cutter, which includes a direct current (DC) motor, a rechargeable battery, a solar panel, a stainless-steel blade, and a control switch. The solar grass cutter is controlled by a switch on board that closes the Circuit and allows current flow to the motor, which drives the moving blade. The solar charging controller recharges the battery. Different varieties of Grasses were used to test the performance of the produced machine.

Keyword: solar panel, Dc motor, cutter blade and grass collecting box.

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## CONCLUSION

The solar lawnmower machine was conceived and manufactured successfully. The solar panel converts sunlight into electrical energy, which is then stored in the battery. However, a charger controller is put beside the battery to assist prevent the battery from being overcharged or discharged. As a result, the battery provides the essential energy to the electric motor. The project's main goal is to design and build a solar grass cutter, which is an environmentally beneficial gadget. There had been several attempts in the past to create a device that cut the grasses, but they were mostly centered on using human or animal muscle power. In addition, technological advancements have led to the use of electric power to propel lawn mowers. People are increasingly focused on employing renewable energy sources for all activities that consume non-renewable resources as the world faces an energy crisis. Similarly, the grass cutter's power consumption has been shifted to the solar sector, which is a renewable energy source.

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*Appendix I*

# ANALYSIS AND DESIGN OF ELECTRIC-TRICYCLE

A PROJECT REPORT

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MAY 2023

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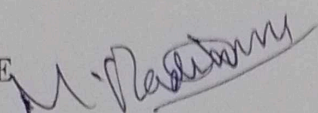
Appendix 2

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BONAFIDE CERTIFICATE

Certified that this project title "ANALYSIS AND DESIGN OF ELECTRIC-TRICYCLE" is the bonafide work of "P.VIGNESH, R.BALAJI, T.NIRMAL KUMARAN" who carried out the project work under my supervision.

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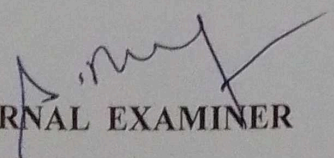
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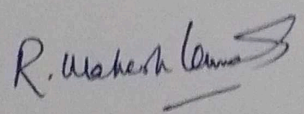
Sivagangai- 630561.

Submitted for the Project Viva-Voce Examination held on...16/05/2023...

INTERNAL EXAMINER



EXTERNAL EXAMINER



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## ABSTRACT

At present, electrical vehicles is being developed, due to the *technology* development in the industries. In the electric vehicle field, design part is *very important* so as to optimize the efficiency of the vehicle. Nowadays demand for the loaded vehicles have been increasing in the transportation of foods. And also Electric vehicles are introduced in order to reduce the air pollution and maintain the Green Environment (Eco-Friendly). Our project is Analysis and Design of E-Tricycle, low cost electric tricycle is taking a major role in the loaded vehicles. Because of low fuel cost and less human effort compared to conventional tricycle. Electric tricycle is much demand on the transportation field. It has three wheeler powered by an electric motor ranging from 650-1400 watts

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## CHAPTER 12

### CONCLUSION

The electric tricycle as compared the conventional petrol powered tricycles gives you a cost savings against the petrol powered vehicles. It has also a reduction of carbon against the conventional tricycle which makes global warming. Safety in automobiles is a very integral part, so the Design was done in such a way the driver can not increase the speed beyond the set limit of 25Km/hr and this helps minimize the hazards and pollutants in the atmosphere. In conclusion, this project seeks to provide an alternative source of power for vehicles., commercial transportation will still be a vibrant sector in the country as total dependence on petrol or diesel will be avoided. In this Electrical Tricycle project three types of designs were made and analyzed by using MAT Lab software, then the best design is recommended to fabricate the Electric Tricycle.