S.No	Innovation/Product Title	Summary of Innovation/Product
1	Anaerobic digestion restricted to Phase-I for nutrient release and energy production	Anaerobic digestion (AD), a multi-step microbial process carried out by heterogeneous consortia of microorganisms with diverse biological and substrate affinities, can be adopted for nutrient recovery and energy production. The AD process has potential to mineralize algae biomass containing N and P in order to produce ammonia and phosphate.
2	Fungal Glucose Oxidase Purified via the Next Generation Chromatography (NGC) System; a Potential Bio bleaching Agent for Local Cotton Fabric	Glucose oxidase (GOx) is recognized as an efficient candidate for bio-bleaching of fabrics. This work is carried out for in-situ production and scavenging of peroxide using GOx for controlled and eco-friendly bleaching of the cotton fabric. Aspergillus niger (Black mold), grown in un-supplemented and calcium carbonate supplemented Potato Dextrose Broth (PDB), was used for the production of the enzyme. First the crude enzyme extract was used to determine the activity of Glucose oxidase in substrate specific bleaching conditions.
3	Production of green enzymes from Fungus	The project aims to synthesize Phytase and Lipase from various fungal strains to be used as a supplement in animal food and to be used as an organic product in the cosmetic industry respectively.
4	Silica Nanoparticles from rice husk for Dye Adsorption	Biogenic nano silica from agricultural waste (rice husk) were prepared successfully through an optimized method as mentioned above. They were also characterization by XRD, FT-IR, SEM, N2 Adsoprtion Isotherms (BET and BJH) which confirmed the synthesis of BioSiNPs. Pure Dye (Rhodamine 6G) of various concentrations were then evaluated for adsorption on BioSiNPs under different conditions (pH and agitation) with dye adsorption of upto 85%.
5	Ethanol Production from Waste of Textile Industries	Ethanol is currently the most abundant renewable in the global fuel market. It is currently produced from sugars and starchy materials, but lignocelluloses are most likely the alternative feedstocks for the second generation of ethanol production in the future (Lynd et al., 2005, Taherzadeh and Karimi, 2007). In cotton, there is no lignin or hemicelluloses, but its crystallinity is relatively high. The crystallinity index of Avicel, wood pulp, bacterial cellulose and cotton is 0.50–0.60, 0.50– 0.70, 0.76–0.95 and 0.81–0.95, respectively (Zhang and Lynd, 2004). Therefore, the main goal of any possible pretreatment of cotton based textiles should be to increase the surface area and decrease the crystallinity. In order to approach this goal, hydrogen bonds between the glucan chains in crystalline cellulose need to be broken, and made to produce amorphous cellulose. In this method developed by Zhang et al. it is possible to approach complete enzymatic hydrolysis to ethanol. Alkali pretreatment followed by enzymatic hydrolysis results in almost complete conversion of the cotton and jeans to glucose, which can then fermented by Saccharomyces cerevisiae to ethanol.
6	Production of Cellulase for Biostoning and Biopolishing in Textile Industries	
7	Design and Development of Generic Relay Test Equipment	Fully indigenous and software based tester is developed for testing relays. The tester compiles the results automatically and accurately
8	Design of RF/Microwave Antenna & Passive Components	Different RF/Passive and active components are designed and developed on latest technologies and the results are simulated and studied.

9	Digital and Integrated Sight before Sighting	Develop and implement a suitable technique for sight bore sighting using image processing and LRF which can be used for target offset with changing range.
10	Prototype development of real time haptic glove for hand and finger tracking against an actual robot claw	Enable the the EOD teams to dispose off unexploded ordnance from a safe distance using a robotic claw controlled by a haptic glove capable of providing haptic feedback to the end effector.
11	Firearms and surface cleaning system using ultrasonic oscillations	Develop a cost effective and efficient apparatus for cleaning of firearms and all types of surfaces using caviation effect of ultrasonic waves.
12	Design and Development of Weapon Capable Drone	An effort to utilize the emerging technology for the development of a weapon capable drone, intending to replace the first line of soldiers.
13	Aeroelastic Analysis of medium altitude long endurance unmanned aerial vehicle	Analytical modelling of fluid-structure interaction system to solve for the aeroelastic response of a male UAV at various flight conditions.
14	Design and Development of Aerial Platforms for intelligent flight in swarm configuration	Analyze various ways employed by the researchers for the design of multirotor UAVs having the ability to fly in the swam configuration.
15	Numerical Analysis of fluid structure interaction of flapping wing for MAV applications	Proposing such a flexible wing that can undergo pitching motions without any external actuation mechanism.
16	Stability and Performance Analysis of hybridvtol UAV	Calculate the stability and performance parameters incase of hover vertical takeoff and forward flight mode.
17	Prototype development of Hand-Held Low-Power IMSI Catcher	Creating an accurate engine analytical model with accurate engine parameters at every station followed by performance and parametric analysis to describe engine's behaviour at different flight conditions.
18	Design and Analysis of EW Antenna Radome and its mounting assembly for Falcon DA-20	Design a low drag radome and mounting assembly for an antenna. Moreover performing aerodynamic analysis of a commercial jet after installation of radome to study the effect of increase in drag.
19	Design of Rocket motor for Assisted takeoff for target drone	Designing a rocket motor capable of carrying 120 kg target drone to a speed of 216km/h.
20	Analysis and Testing of Bullet Impact on Kevlar Reinforced composite for protection of Warrior robot	The project aims to provide protection for warrior robot by using kevlar reinforced composite laminate by computational analysis of kevlar composite laminate on ANSYS.
21	Development of Lab Model for synthetic aperture radar (SAR) experiments	Simulation of matched filtering and backprojection SAR imaging algorithms on different SAR datasets and reconstruction of collected raw phase history data using Urad kit by matched filtering algorithm.
22	EKKO-Wave Therapeutic Device	EKKO is a high-tech electronic device to generate artificial neuro-transmissions that are an advancement in cognitive rehabilitation - a modern concept to rehabilitate patients suffering from neurogenic disorders. This concept is based on a new therapeutic procedure titled “Neurotransmission Cognitive Therapy” to implement neuro-transmission cognitive theory innovated by Mr. Shahbaz Khalid Ranjha, a renowned psychologist and speech pathologist.

23	Hess Screening System for Squint Analysis	The components of product are Digital Hess Chart Screen: On this square shaped screen, there are LEDs of red color which the patient points out with the laser. Chin rest: Here the patients place their chin in position of the equipment made for proper fixture of eye in front of the screen. Al-Basr Hess Chart Diagnostic Software: This software helps in coding the data that is gathered from where the patient points on the screen and according to that, the point/s of deviation of the eye from the mean position is found. Computer system and printer: A computer can be connected with the system both manually with a wire and also wirelessly. It is also connected with the printer which helps in getting image of misalignment of eyes to check how far away the eye needs to be stretched or relaxed to correct the vision.
24	Augar	There are two main goals of this project, Reduce the time taken for plantation, Reduce the workload on the person by making their task a lot easy. Finding alternative ways with greater efficiency in planting on large scale. Where a person can dig and plant about 3 trees in an hour, the Power Drill can dig a hole in minutes. The mechanism is simple with no complexities, is easy to use, light weight so can be carried easily and no technical knowledge is required to operate it.
25	Solar Panel Cleaning Robot	It utilizes a brush cleaning system that cleans on set cleaning cycles. It uses a rolling brush to clean as it horizontally translates across an array of panels. The device is mounted on a set of battery powered-motorized wheels. Beyond improving the efficiency, we hope that our design will continue to expand the growth of solar energy globally. An efficient cleaner would not only help communities' transition into using cleaner alternative fuel sources, but help society, as a whole, move closer toward providing everyone the opportunity to harness reliable energy.
26	Trek UGV	Life of soldiers has always been of paramount imp for the mil comd. Modern army command have always been looking for the options through which they can engage the target from a distant location without endangering lives of their soldiers, especially in unknown environment.
27	IED Disposal Bot	Modern Armies of the world are focused towards the safety of their soldiers in the current arms conflicts. Pakistan Army engaged in the conflict against war on terror is also concerned about this aspect and looking for the sol in the form of some Unmanned Platform with can provide surveillance capability while being operated from remote location.
28	Live Line Cleaning Bot	Power transmission poles have insulators that isolate transmission lines. Due to humidity and dust accumulation, the insulators have chances of getting short and sometimes, arcs are also seen due to high voltages. To avoid any hazard, insulators are cleaned periodically using high pressure ionized water jet. For this purpose, a person must climb the power poles.
29	Throw Bot	Life of soldiers has always been of paramount importance for the military command. Modern army command have always been looking for the options through which they can scan the target area from a distant location without endangering lives of their soldiers.

30	Spray Drone	An agricultural drone is an unmanned aerial vehicle used to help optimize agriculture operations, increase crop production, and monitor crop growth. Sensors and digital imaging capabilities can give farmers a richer picture of their fields. Using an agriculture drone and gathering information from it may prove useful in improving crop yields and farm efficiency. Unmanned aerial vehicles (UAVs), as emerging plant protection machinery, have the advantages of high operational efficiency, high speed, and low drift.
31	InSole	The insoles are made of highly flexible and durable Thermoplastic Polyurethane (TPU). Since a person's foot profile varies, custom insoles are developed while taking into consideration all the features of the foot profile like foot size, weight, foot arch, and pronation angle to make the insoles that best suit your need.
32	Prosthetic foot	It is a passive prosthetic foot that works on the principle of storing potential energy and releasing it which means that this foot does not require any actuators or joint. Therefore, it is light in weight and has no delay in response. This product can be adjusted for your level of comfort by changing the deflection of the toe and heel.
33	Training Kits for Schools	Arduino based training kit for beginner and advance level users has been developed. User can develop many types of beginner and advance level projects by using this kit. This kit includes Arduino UNO, many types of sensors like IMU vibration sensor, ultrasonic sensor, Temperature/Humidity sensor, IR sensor, Bluetooth module, RFID Module, motors (DC motor, servo and stepper), motor driver, display module and relay module.
34	Firmware Extraction Analysis and Security Assessment Tool	FEAST performs the security assessment and vulnerability analysis of extracted firmware from embedded devices
35	OS Compliance Tool Kit	An automated Operating System Compliance (NIST, FIPS, CC) Tool
36	Web – Defacement Tool Kit	Automate Bot for continues scanning of website for defacement detection
37	S - VPN	Secure virtual private network provides a safe tunnel for users as well as corporate sector.
38	NetXploit	Automated pen testing toolkit
39	Cyber News Recommender System or Fake News Detection System	System to recommend and predict popular news of cyber security system to detect textual fake news on social media using machine learning
40	Zero – Day Malware Analysis Sandbox	A sandbox designed to detect malwares which are previously unknown i.e their detection signature is not available
41	Chemmersive	
42	Shooting Training Simulator	
43	Measuring Work Efficiency	
44	Pipeline for early leukemia detection	
45	CrasAir	Pakistan is facing many environmental issues such as increasing temperatures, air pollution, dry weather, inadequate rainfall etc., and among these problems, the poor air quality in urban regions is a major concern owing to its detrimental impacts on the environment and public health. To remedy this, CrasAir provides a sustainable and scalable IoT-based air quality monitoring system which will help to collect data across the city in a near ubiquitous fashion to overcome the limitations of conventional costly and inefficient methods of air quality monitoring

46	Intelligent Scalp Bike Helmet	Smart helmet is designed to ensure bike rider's safety during collision or accidents. It is equipped with combination of sensors linked with android app which continuously monitors bike rider's acceleration and tilt angle from the road. In case of accident real time location of bike rider will be shared to the given number through text message so that emergency services can be reached on time.
47	NIAQ	Indoor air quality typically alludes to the ambient conditions inside the buildings such as shopping complexes, hospitals, classrooms, offices etc., that may affect human health, and work performance.To overcome this issue, NIAQ provides a platform that can measure a variety of parameter indoor and provide helpful information to the individuals to better understand the air they are breathing in.
48	Water Sense	Pakistan is facing sever water scarcity crises, which leads to destruction of hydrological cycle, global warming, droughts and severe climate change. In 2018 International Monetary Fund ranked Pakistan 3rd among countries facing acute water shortage. Key factors of water wastage include water wastage at homes, irresponsible consumption, overflows, leakage etc.
49	AquaSense: Surface Water pollution monitoring using Internet of Things (IoT)	This technology solves the problem of water wastage due to overflow of tanks and avoids the hassle of manual working of the motor. It addresses the problem of water wastage in households and manages the water in tanks using automatic control. Moreover, being an IOT based solution it records the consumption of water by consumers and also helps users to monitor their motor status, water levels etc.
50	CroHMI: Crop health monitoring using the Internet of Things (IoT) and Low altitude imaging platform	Pakistan is an agricultural country but unable to produce surplus for national and international market needs. Moreover, monitoring of crops on a field becomes a challenge especially if agriculture land covers a large area and monitoring is solely dependent on farmer's knowledge-base and experience. To cater these problems CroHMI provides an IOT based solution which monitors air and soil moisture and temperature levels, and ammonia gas. In Addition, an UAV is also used to capture optical and multispectral images, which helps in mapping the chlorophyll level of the plants at certain areas, which helps in prediction of yield.
51	Design and development of a Hydraulic Distributor Testing Rig in Fiat 640 Tractors	The Project aims to develop a testing rig to simulate loadings on a Hydraulic distributor in Fiat 640 Tractors by using a hydraulic actuator and instrumentation techniques. The testing rig will be controlled by a software. This will help to standardize the manufacturing of Hydraulic distributors at Al-Ghazi tractor industries. Eventually it will facilitate to export manufactured parts as per international standards.
52	Design and Multiobjective Optimization of Stealth Unmanned Combat Aerial Vehicle (UCAV)	Design and multi-objective optimization of a UCAV with respect to Aerodynamics and Radar Cross Section. The project entails the Mechanical Design of a single unit, including the complete Aircraft Design process from Concept Design to Final Integration with emphasis on Stealth.
53	Hybrid M-Cycle Cooler	We will be developing a Hybrid M-Cycle Cooler with the aim to decrease the temperature as well as humidity. We aim to develop and analyze the M-Cycle cooler prototype. We will be working on improvement of M-Cycle cooler by decreasing the humidity by finding the optimal dehumidification method.

54	Pile cage welding machine	Rebar cages are utilized in pile foundation for large civil structures like bridges and factories. The rebar cages are made in Pakistan by manual labor resulting in low efficiency, wastage of material and low quality. Pile cage welding is a fabrication apparatus that will fabricate rebar cages with better quality and efficiency. The project aims at design and prototype development of pile cage welding machine. The project will help strengthening the industry-academia linkage as well as advancing technology in local industry to help them compete with international companies.
55	Thermal Characterization and Management of Commercially available Photovoltaic Cells	Commercially available photovoltaic cells have a reported efficiency of 13-25% which decreases with increase in temperature and it has been shown that for monocrystalline cells the conversion efficiency drops by 0.08%/K. At ambient temperature of 40 C the cell temperature can rise to 80 C causing a significant drop in efficiency. We offer technology to improve the efficiency of PV cells by decreasing temperature of cell using passive thermal management techniques designed for client needs.
56	Design and Fabrication of a Hybrid DarrieusS-avonius Vertical Axis Hydrokinetic Turbine	The total installed capacity of hydropower utilization in Pakistan is around 15% of the 60,000 MW identified potential resources, of which the irrigation network (consisting of canals and barrages) can contribute over 350 MW. Our patented hybrid design, merges the advantages of Darrieus and Savonious turbines for low-pressure-head and low-flowrates; enabling investors to exploit this 350 MW potential for clean energy production.
57	Using elastomer pneumatic muscles to design a soft wearable robotic device for active knee motions	Soft robotics has grown in popularity in recent years. Many new ideas are being explored in this field, and one of these is the use of flexible muscles made of elastomers that can be actuated using pneumatics. One particular application of this includes the development of a wearable robotic device that can assist and complement knee functions for people who have injuries, or are suffering from bone diseases such as osteoporosis. The 'soft' feature ensures that no harmful stress or strain is induced on the bone structure and at the same time, the wearable device can assist in the knee motion. The project aims to develop and test such a soft robotic device.
58	Prosthetic Limb for Transtibial Amputation	The aim of the project is to develop an artificial lower limb that will aid in restoring the normal functions of an amputee. It will use an externally powered energy storing and retrieval system that will provide the extra torque required in order to mimic the normal
59	Development of Bipedal Hopping Robot	A biped robot will be developed using rigid and elastic elements to demonstrate hopping capabilities. Such robots can be deployed as search and rescue team members with advanced locomotive competences especially in terrains where wheeled robots find it impossible to perambulate, such as rocky, grassy or wet areas. To this end, a control system will be developed to make an energy-efficient legged robot adept to maneuver about without losing stability when challenged with obstacles. Energy efficiency here refers to the recovery of energy form the preceding gait cycle using elastic (energy storing) elements. The robot will be taking proprioceptive feedback of its linkages/ limbs and exteroceptive information from the environment using sensors.

60	Design and Development of a Low Cost Semi-Active Knee Prostheses for Amputees	Design, analysis, and fabrication of a trans-femoral or above-knee prosthesis for amputees. Prosthetic solutions for trans-femoral amputees are more complex than those for below-knee or trans-tibial amputees because of the presence of the knee joint. Solutions proposed in recent times have either been too expensive, thereby
61	Autonomous Solar Powered UAV	As we all know world population is increasing, so is the threat to security and life. Therefore, to resolve this issue, we propose a cost effective solution. A flying aerial robot built for surveillance, with little to no human interaction. We will design an Unmanned Aerial Vehicle (UAV) which can stay in air for a long period of time, has unlimited range and can simultaneously send live feed to the ground stations, all the while allowing us to monitor our subject of interest. Once a command is given, it will unplug from the charging port, taxi
62	Design and fabrication of an electromyographic prosthetic hand	With the world excelling rapidly in the field of prosthetics, it is revolutionizing how we see amputees. Amputees are no more disabled as robotics and prosthetics are making landmarks achievement in making prosthetic limbs that are actually doing the same tasks as real human limbs. John Hopkin Institute, Bebionic and many other have made considerable achievements in it and many companies are bringing in their products now. We here at SMME are aiming to make a prosthetic hand which will mimic the operations of a hand and can be implanted on an amputee.
63	Human Following Shopping Cart	Automating a shopping cart which will be able to follow a human using one of the various methods that can be used for this purpose.
64	Design of building mounted vertical axis wind turbines	Design a VAWT feasible for urban areas. Minimize losses due to friction and enhance efficiency. Moreover look for the strengthening factors effecting performance OF WIND TURBINE and find optimized solution in this aspect
65	Design and Development of Thread Testing Rig for Suspension Rod	Threaded fastening is widely used in automotive industry as quick means to assemble two or more parts. It is, however, necessary to make sure that the quality of the threads manufactured is according to the required standards. Manual testing does not suffice the aforementioned need. The aim of this project is therefore to automate the very process of checking the thread quality of suspension rods. Since rods with properly manufactured threads would have a specified tightening torque, an apparatus would be both designed and manufactured that checks these values of torque against some pre-defined values. The apparatus would include two parts, one fixed and the other moving. The fixed part would be essentially containing the gauge, a motor to rotate the gauge, bearings, and a load cell. The moving part would contain the workpiece to be tested, pneumatic actuators, railings (as sliders), v-blocks and mechanism to clamp the work-piece. Data acquisition would be employed to create an output regarding the quality of threads of suspension rods
66	Paper recycling machine	To produce a high quality recycled paper with lower operating cost and time by process of pulping, de-inking and drying.
67	Automated Nursing Bed	The project will enable us to aid and help the disabled people who are unable to physically move. It will make it easier for their caretakers to take care of the disabled.
68	Design and development of CNC Paint Sprayer	Design of a CNC paint sprayer prototype to paint automobile parts by using a paint sprayer mounted on a gantry that moves on top of a horizontal bed by means of linear rails and electric motors.

69	Development of a fully automated exoskeleton hand capable of ADL	Analysis of Existing rehabilitation hand exoskeleton for ADL purposes and making consequent design modifications to achieve ADL via a suitable sensory feedback mechanism. We intend to develop a fully usable end product.
70	Valorization of biomass residues for methane production through anaerobic digestion technology Green energy recovery from waste	
71	An Advanced Rotor for H-Darrieus Type Vertical Axis Wind Turbine	
72	Designing and Fabrication of Semi-Continuous Stirring Tank Reactors to Evaluate and Optimize the Anaerobic Co-Digestion of Poultry Manure	
73	Autonomous 11kV Distribution Line Fault Localization System	
74	Designing and Fabrication of Semi-Continuous Stirring Tank Reactors to Evaluate and Optimize the Anaerobic Co-Digestion of Poultry Manure	
75	Synthesis of valuable marketable chemical products from Waste Lithium Ion batteries (LIBS)	
76	Synthesis of energy blocks (RPF) from waste plastic and food waste	
77	Grey water treatment system for water reuse in Toilet flushes	
78	Decentralized Wastewater Treatment System (Integrated Sanitation Solution)	
79	Smart Indoor Navigation for the Visually Impaired	Development of a system or device for Visually Impaired Peoples to guide them properly and to overcome dependency on others
80	Design and development of a GIS integrated vector(dengue carrying mosquito) monitoring device for disease outbreak modeling and control	Development of a system to trap the dengue mosquito and then model the concertation of disease outbreak
81	Web Based Geospatial Processing Platform	Development of free web based geospatial platform. Currently available platforms are paid and expensive.
82	Development of Automated Irrigation System	Development of an automated irrigation system to make it smart for the betterment of water management and agriculture system
83	Early Warning System for Coal Mine Collapse	Development of a system to manage coal mine system efficiently. This system will help the labor to improve early warning of the coal mine collapse
84	Modeling and Simulation of Electric Propulsion System of Unmanned Underwater Vehicle using MATLAB GUI	
85	Design and Development of Optical Wireless Communication System	

86	Design and Development of Test Bench for Functional testing of three phase load balancing device	
87	Design and Development of Quadrupled Robot	A robust and versatile four-legged robotic platform designed to operate in challenging environments. Inspired by nature, based on a structure that can imitate legged mammals to perform its motion. Each leg is actuated electrically resulting in 12 Degrees-Of-Freedom, giving it the versatility to traverse across different landscapes. Manipulation both over and across obstacles and the ability to travel staircases, sets this robot apart from others. With onboard computation and sensors to perform an autonomous operation as well as remotely controlled. It's multipurpose application base is defined by its expandable tooling kits like robotic arms, stereo cameras, etc.
88	Design and Fabrication of unconventional wind energy harnessing mechanism	It is an unconventional wind turbine which is omnidirectional (can capture wind from any direction) and direct the flow to a flow duct where wind flow is developed and then to a Venturi Section which increases wind velocity up to two times. This high speed wind then rotates the blades of turbines. The design has a concealed blade so it can be used at commercial and domestic areas without any damage to humans or wildlife. As there is only one moving part that is turbine it will need much less maintenance than conventional turbines.
89	Design and Fabrication of an atmospheric water generator by liquid desiccant	Atmospheric Water Generator, converts the moisture into liquid water and is modelled to work independently without any water reserve. The product extracts water at extreme weather conditions with relative humidity as low as 30% and temperature below 35 °C. This is achieved by a relatively new concept of liquid desiccants where desiccant is a hygroscopic element. It absorbs moisture from the surrounding at a higher pace. Next the extraction process yields out all the water from desiccant that it has absorbed from atmosphere and regenerated to further continue the cycle.
90	Design and Fabrication of Parabolic trough collector array for desalination plant	The product works on the principle of concentrating incident solar irradiance on the focal axis of parabolic trough. Multiple small sized mirrors are bent to a parabolic profile and attached to a sturdy spaceframe. The frame is also equipped with shaft and bearing arrangement so that the frame is rotatable. A gearing system is also attached to the frame to aid in the manual tracking of the parabolic trough's aperture with respect to the sun's movement.

92	Design and Manufacturing of autonomous vertical takeoff and landing (VTOL) UAV with self-reconnaissance	Blue Martin is an autonomous hybrid UAV. This design has the capability to take off and land vertically like a rotary wing design UAV, and simultaneously possess the capability to cruise like a fixed wing design UAV. The UAV works on electric propulsion system, and is equipped with 3 electric motors. The UAV holds the capability to tilt the front two motors (using the customized tilting mechanism). These tilting motors help in the transition of UAV from rotary wing to fixed wing. With motors tilted upwards, the UAV takes off vertically. After the attainment of a specific safe height, the UAV is made to switch its mode to horizontal flight. For landing back, the UAV makes its transition to VTOL mid-flight by tilting its motors upwards. This tilting mechanism makes it capable of having the advantages of both the designs, i.e. rotary design and fixed wing design, and eliminates the flaws of both. The overall assembly of the UAV is modular, and comprises of a V-tail tail assembly, pod and boom fuselage, balsa and ply wing structure with carbon fibre load bearing spars. The UAV is also equipped with the capability of reconnaissance.
95	Design and Fabrication of a set of machines inter-linked to give useful products by using recyclable plastic (PET)	It is a small-scale portable plastic bottle (PET) recycling cell. Which will recycle plastic PET bottles and make useful products from them. This will be done by two set of machines namely Shredding unit and Injection unit. Shredding unit will convert the plastic bottle into small sized pellets which will be then fed into the injection unit. Injection unit is the unit where melting of plastic takes place. This melted plastic will enter the mold where it will solidify, and variety of products can be obtained depending upon the shape of mold. These two units will be interconnected and provide useful plastic (PET) products at a good rate. We aim to make the recycling cell portable so it can be installed in variety of locations and promote plastic recycling. Hence making plastic recycling more accessible for the public.