# విజ్ఞాన సూచిక

### మాస పత్రిక

# VIGNANA SOOCHIKA (Print)

## INTERNATIONAL JOURNAL OF MULTI DISCIPLINARY SUBJECTS

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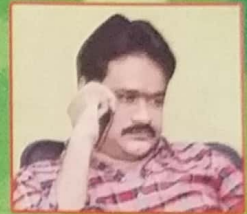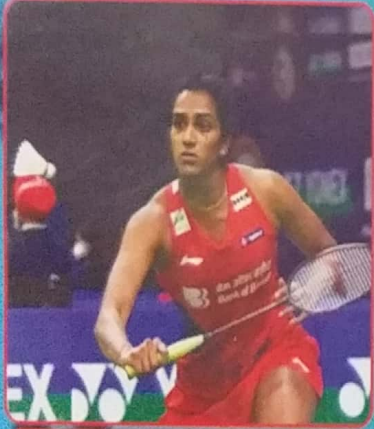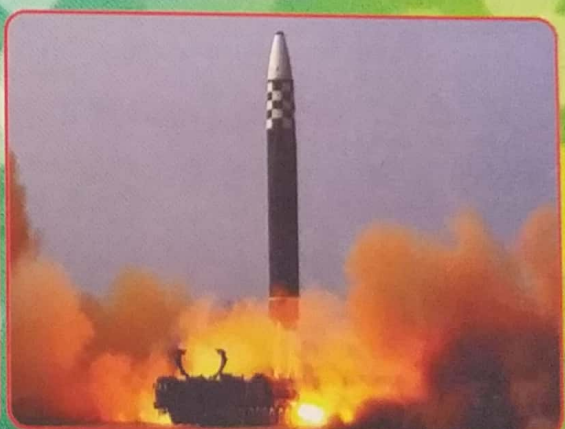
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స్విస్ ఓపెన్ వరల్డ్ టూర్ సూపర్-300 టోర్నీ 'విజేత'

అస్తమించని తెలంగాణ రైతాంగ సాయుధ పోరాట 'గళం'

కొత్త తరహా ఖండాంతర క్షిపణిని ప్రయోగించిన 'ఉత్తర కొరియా'

# Special Focus on National Science Day Projects exhibited by Silver Jubilee Government College (A), Kurnool (Dist.), A.P., India

## Air Pollution Filter

**Dr. MohammedWaaiz[1], Dr.M. Shanawaz Begum[2],G.Ameer Basha[3], Dr.C.Sudheendra[4], S.Habibunnisa[5], K.Krishna Priya[6], R. Punyavathi[7], G Sravani[8]**

1,2,3,4 Lecturers in Physics, 5,6,7,8 II B.Sc MPC

## Department of Physics, Silver Jubilee Government College(A), Kurnool, A.P., India

**Abstract:**

This Project describes the designing and implementation of Air pollution filter which can filter the dust particles present in the air in a room and provide clean air for breathing. This project is designed in a simple way with easily available materials of low cost.

**Keywords :** Air Pollution,Petroluem jelly, Exhaust fan

## I Introduction:

Air Pollution can be described as presence of substances and gases in more than required quantities and harmful effects in the Eco system[1].The major contributors to the air pollution are Population explosion, rampant industrialization, and exploitation of natural resources by exceeding the limit, vehicular traffic and other combustion devices[2]. Air pollution also affects the wealth and health of people[3]. Nearly 23% of overall global deaths is due Air pollution according to a report of World Health Organization 2012. According to satellite based remote sensing data and Ground-level in situ measurements more than half of India's population is exposed to dangerous level of fine particulate pollution[4]. Air pollution is one of the major causes of death in India. According to a news report the air pollution causes 1.1 million premature deaths every year. Hence an attempt is made in this project to develop low cost and low maintenance Air pollution filter system capable of filtering the air by removing the dust particles. This is the main theme of this project.

## II Materials:

The prototype requires the following materials for designing the project:Exhaust fan with certain 200C.F.M (cubic feet per minute), WhiteTransparent sheet, Petroleum jelly, Corrugated box, Hack saw blade, Plaster and 9VBatteries.

## III Methodology:

The project prototype is shown in the figure. Acorrugated box with dimensions of 36cmx28cmx 30cm is taken and on the smallest side of the box, a circular hole of radius equal to exhaust fan is made using a hacksaw blade. The exhaust fan of 200cfm is placed inside this hole and tape the flaps at the bottom of the box.Now mark out the height of the bottom flap so that other flaps are just above it. Cut all 3 of these flaps andtape up.A transparent white cloth or sheet with petroleum jelly applied on it is placed exactly below the fan in the box. Now switch on the exhaust fan.

## IV Observations and Result:

When the battery is switched ON, the fan blades rotate and sucks the air inside the box. The dust particles present in the air gets stick to the transparent sheet and cleaner air flows into the room.If fan works up to 1.8 minutes, then it

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is equal to human breathing for 1 day. If fan works up to 54 minutes, then it is equal to human breathing for 1 month. If fan is working up to 24 hours, then it is equal to human breathing for 2 years.

### V Conclusion:

Thus, Air pollution filter is a eco-friendly low cost system which can catch or remove the dust particles present in the air and help people breath in a clean environment. This equipment can be installed in any polluted areas of any city or town.

### References :

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[2]. "Climate change 2007 synthesis report," published by intergovernmental panel on climate change.
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[4].Greenstone M.,Nilekani J, Pande R, Ryan N,Sudarshan A and Sugathan A , Lower Pollution, Longer Lives: Life Expectancy Gains if India Reduced Particulate Matter Pollution. Economic and Political Weekly. Vol. 50, Issue No. 8, 21 Feb, 2015.

# Earthquake Detector

Dr. M Shanawaz Begum[1], Dr. Md Waaiz [2], G. Ameer Basha[3], Dr. C Sudheendra[4], V. Supriya[5], K. Kavitha[6], 1,2,3,4 Lecturers in Physics, 5,6 I B.Sc. MPC

### Department of Physics, Silver Jubilee Government College(A), Kurnool, A.P., India

### Abstract:

This Project describes the designing and implementation of Earth quake Alarm which can detect the earth quake vibrations and raise alarm to alert the people about the disaster and save the precious lives. This project is designed in a simple way with easily available materials of low cost.
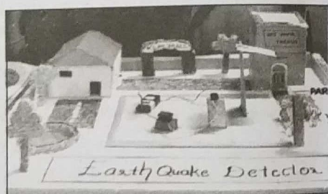Keywords: Earth Quake, Vibration Sensor

### I Introduction:

Earth quake is a natural disaster in which earth shakes. This causes mass destruction as its magnitude. When earthquake occurs then normally it brings many natural calamities. When this happens near human settlements then it may cause even great loss to human life. Sometimes it may introduce other disasters such as Landslide, Tsunami etc., that may severely disrupt human life. Earth quake may occur naturally due to displacement of tectonic plates inside earth and due to volcanic eruptions. India stands at 3rd place in the occurring of major earthquakes all over the world with great number of people having lost their lives. The intensity of an Earth quake is measured on Ritcher scale ranging from 0 to 10 using Seismometer. Most of the people cannot feel the vibrations of low intensity. So, if an Earth quake is detected at early stage by rising an alarm it can alert the people which can be life safer. Hence an attempt is made in this project to develop an Earth quake detector system capable of detecting it and raises an alarm. This is the main theme of this project.

### II Materials:

The following materials for designing the project:Buzzer, Copper wires, Dynamo, Vibration sensor, Connecting wires and 9V Batteries.


Earth Quake Detector

### III Methodology:

The project prototype is shown in the figure. A box with dimensions of 40cm x 24 cm made of cardboard is taken. A vibration sensor is fixed to one side of the box for resembling earth quake simulations. A copper wire is hanged within a nutshell of metal as a pendulum. A 9V battery is connected metal nutshell and to the buzzer with the copper wire acting as a switch.

### IV Observations and Result:

Buzzer is the main component in this alarm model. There is a copper wire with a Nutshell hanging.When the hanging copper wire oscillating, the buzzer gives us sound. The basic principle of working and earthquake detector is vibration sensor, when an earthquake occurs or when the dynamo (earthquake simulator) is started, the resulting vibrations cause the movement of the pendulum. The pendulum movement will give trigger sound of the alarm. This alarm sound gives the detection of earthquake.

### V Conclusion:

Thus, Earthquake detector designed helps to alert us from earthquake so that we can make plan for future and immediate safety measures. Many times, this alarm can be life saver too. With simple materials and science concept this project is designed.

### References

1. Wu, Y.M., and H.Kanamari (2008a), development of an earthquake early warning system using real time strong motion signals, sensors Vol 8,1-9
2. Himanshu Mittal, Ashok Kumar and Kamal (2013) Ground motion estimation in Delhi from postulated regional and local earthquakes.
3. Journal of seismology,17(2),593-603.

# GREEN AND SAFE CHEM LABS

Dr. K. Nagaraja Setty[1], Dr. M.Balaraju[2], Dr. B. Venkanna[3], Dr. B. Anusha[4], Dr. C. Sudharani[5], Dr. Meer Altaf Ahmed[6], K. Prabhakar[7], T.M. Amrutha[8]
1, 2, 3, 4, 5, 6 Lecturers in Chemistry, 7, 8 III B.Sc, BZC

### Department of Chemistry Silver Jubilee Government College (A), Kurnool, A.P., India

### Abstract :

The objective of this project is mainly to minimize the · usage of chemicals for the identification of elements and functional groups present in various compounds. The above said process was achieved by following the 12 Green Chemistry principles.

### Key Words:

Green and Safe chem. Labs, micro pipette,micro level, ceramic tray.

### I Introduction:

Chemistry plays a vital role in the manufacture and synthesis of variety of products that are used in daily life. Due to this, lot of chemicals is released in to the environment; consequently, that affects the life of all kinds of organisms[1]. To overcome these hazardous effects, one must follow the 12 basic Green Chemistry protocols for the sustainable development of the Nation. In the present article, we have followed the 1st and 12th principle of Green Chemistry to prevent wastage and minimize the quantity of chemicals used (Figure 1)2,3.

### II Materials:

5 mL test tubes, ceramic trays, micro pipette, beakers, reagent bottles.

### III Methodology:

We have performed the reactions in two ways. One is by using 5 mL test tubes, another one is by using ceramic tray. By using micro pipette we have performed the reactions in micro level both in 5 mL test tubes and ceramic trays.

### IV Results and Discussion:

Procedure in 5 mL test tubes: 0.5 mL of dil. HCl is added to the 0.25 mL of lead nitrate aqueous solution forms lead chloride as white precipitate.
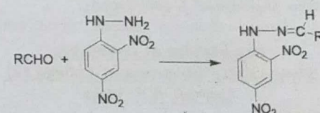


Procedure in ceramic tray: One drop of Borsch's reagent (2,4-dinitro phenyl hydrazine) is added to one drop of aldehyde forms the corresponding hydrazones as yellow/ orange ppt as a spot.

## I. Introduction:

Generally, we send robots to explore space without having to worry much about their safety. Of course, we want these carefully built robots to last. We need them to stick around long enough to investigate and send us information about their destinations [1]. But even if a robotic mission fails, the humans involved with the mission stay safe. Sending a robot to space is also much cheaper than sending a human. They can survive in space for many years and can be left out there — no need for a return trip. Further, robots can do lots of things that humans can't. Some can withstand harsh conditions, like extreme temperatures or high levels of radiation, hard vacuum, corrosive atmospheres, very fine dust, etc. Robots can also be built to do things that would be too risky or impossible for humans[2]. While Space Robots are being deployed for exploration purpose by different space powers across the globe, the key issue in Space Robotics is allowing a distant human to effectively communicate and command the robot to do useful work in extreme environments and simultaneously operating in distant planets. Using Space Internet to Control Robots. ESA and NASA have tested a communications protocol that will allow astronauts to control robots from space stations orbiting planets or asteroids. The test marked the way for a trial-run with an astronaut on the International Space Station[3].
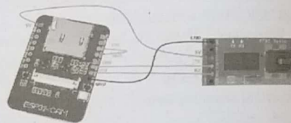
## II. Working procedure:

### 2.1. Control the robot through internet:

Open up your router settings. There you will find some settings, including something along the lines of Forwarding or Port Forwarding. The important thing to note here is the "Port Range" and the "Device" or "IP address". In "Port Range" you should type 80-81. For "Device" you should select your ESP32-CAM device[4].

The first step to controlling robots from space requires a form of Internet to send commands and receive information back. A new network protocol called the Disruption Tolerant Network assures correct operation even in less-than-ideal conditions. This protocol stores commands if a signal is lost and forwards them once communication is returned over extremely long distances. The DTN is similar to the internet on Earth, but is much more tolerant to the delays and disruptions that are likely to occur when data is shuttling between planets, satellites, space stations and distant spacecraft. The delays can be due to solar storms or when spacecraft are behind a planet[5].

### 2.2.Getting the IP address

After uploading the code, disconnect GPIO 0 from GND. Open the Serial Monitor at a baud rate of 115200. Press the ESP32-CAM on-board RST button. The ESP32-CAM IP address should be shown in the Serial Monitor.



### 2.3. CONTROL A VIDEO SURVEILLANCE ROBOT

Disconnect the ESP32-CAM from the FTDI programmer. Connect the ESP32-CAM back to the Pan/Tilt platform, turn on power and press the ESP32-CAM on-board RST button.

### III.Results and Work Analysis:

A wide range of area surveillance is carried out using the rover's night vision camera, as well as an autonomous system in which, when sound is detected[6], the robot will follow a specific path and proceed to the spotted location, capture the area, and send it to the police station's server via IOT[7].

### IV. Applications:

- Search and Rescue Operation.
- Military operations.
- Surveillance along border.
- Maneuvering in hazardous environment.

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## V.Conclusion:

This Infrastructure to send commands to a surface robot from an orbiting spacecraft and receive images and data back from the robot is highly vital. Harnessing reliable feedback, an astronaut controller could automatically adjust the force their robot needs to do very fine, precise work, offering truly remote hands to do the work safely. As more nations are planning to deploy space robots, space stations, etc , It is, therefore, crucial to have a common command and control for network of space items. The idea that a Space Network — the system of a network of nodes consisting of Space Robots, Spacecrafts, etc — is a likelihood as Space-Internet that could transform the future of space exploration so that we can send things to the space network just as we send things using the internet on Earth.

## VI.References:

[1] Selvam, M. "Smart phone based robotic control for surveillance applications."Dept. of ECE, Karpagam University, Coimbatore, Tamil Nadu, International Journal of Research in Engineering and Technology (2014).
[2] Jenifer, T. Maria, et al. "Mobile Robot Temperature Monitoring System Controlled by Android Application via Bluetooth." International Journal on Advanced Computer Theory and Engineering (IJACTE) 2.3 (2013).
[3] Pahuja, Ritika, and Narender Kumar. "Android Mobile Phone Controlled Bluetooth Robot Using 8051 Microcontroller." Electronics & Communication Engineering Department, BRCM College of Engineering & Technology, Bahal, India, International Journal of Scientific Engineering and Research (IJSER) www. ijser. in ISSN (Online) (2014): 2347-3878.
[4] Mehta, Mr Lokesh, and Mr Pawan Sharma. "SPY Night Vision Robot with Moving Wireless Video Camera & Ultrasonic Sensor."
[5] Yeole, Aniket R., et al. "Smart Phone Controlled Robot Using ATMEGA328 Microcontroller."

# HYDROPONICS

Dr. R.Vinolya Kumari*, Sri. G. Ranganatha& C.Lakshmi Sirisha
Department of Horticulture,
Silver Jubilee Government College (A),
Kurnool, A.P., India

## ABSTRACT:

Hydroponics is a soil-less culture technique is developed which plant can grow in a liquid or water solution. A large number of crops or vegetables can grow by hydroponics in that quality of yield, taste and nutritive value of end products is generally higher than the natural soil-based cultivation. This cultivation is cost efficient, disease free and eco-friendly.

## INTRODUCTION

The hydroponics definition states that it is the cultivation of plants in water. It is a subcategory of hydroculture and is a useful technique of growing plants without soil. Through this technique, roots absorb the nutrients present in water and fulfil their growth requirement. Furthermore, through this method, one can grow plants in liquid, sand or gravel by simply adding some nutrients to it. Similarly, residents of cities with limited space are using this method to grow fresh plants in their home and surroundings.

**MATERIAL:** Frame,Growing pipes,Water solution tank, Water pump, Timer, Growing cups, Growing media, Nutrients solutions A andB, Fresh water, TDSmeter, pHmeter, Seeds, Water solution tank.

**METHODS:** The first step to a successful hydroponic garden is directly linked to choosing the correct system for the plants that suit best. Now we have used the Media-based systems are based on providing the medium to support the plants and hold nutrient solutions around their roots. Most of these systems operate on timers and nutrients replenishing systems, and systems to drain the water so that the plants can draw in the atmospheric oxygen. These systems are super-efficient because the nutrients are replenished back in the reserves.

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## I. Introduction:

Generally, we send robots to explore space without having to worry much about their safety. Of course, we want these carefully built robots to last. We need them to stick around long enough to investigate and send us information about their destinations [1]. But even if a robotic mission fails, the humans involved with the mission stay safe. Sending a robot to space is also much cheaper than sending a human. They can survive in space for many years and can be left out there — no need for a return trip. Further, robots can do lots of things that humans can't. Some can withstand harsh conditions, like extreme temperatures or high levels of radiation, hard vacuum, corrosive atmospheres, very fine dust, etc. Robots can also be built to do things that would be too risky or impossible for humans[2]. While Space Robots are being deployed for exploration purpose by different space powers across the globe, the key issue in Space Robotics is allowing a distant human to effectively communicate and command the robot to do useful work in extreme environments and simultaneously operating in distant planets. Using Space Internet to Control Robots. ESA and NASA have tested a communications protocol that will allow astronauts to control robots from space stations orbiting planets or asteroids. The test marked the way for a trial-run with an astronaut on the International Space Station[3].

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[3] Pahuja, Ritika, and Narender Kumar. "Android Mobile Phone Controlled Bluetooth Robot Using 8051 Microcontroller." Electronics & Communication Engineering, Department, BRCM College of Engineering & Technology, Bahal, India, International Journal of Scientific Engineering and Research (IJSER) www. ijser. in ISSN (Online) (2014): 2347-3878.

[4] Mehta, Mr Lokesh, and Mr Pawan Sharma. "SPY Night Vision Robot with Moving Wireless Video Camera & Ultrasonic Sensor."

[5] Yeole, Aniket R., et al. "Smart Phone Controlled Robot Using ATMEGA328 Microcontroller."

# HYDROPONICS

Dr. R.Vinolya Kumari*, Sri. G. Ranganatha& C.Lakshmi Sirisha

**Department of Horticulture, Silver Jubilee Government College (A), Kurnool, A.P., India**

## ABSTRACT:

Hydroponics is a soil-less culture technique is developed which plant can grow in a liquid or water solution. A large number of crops or vegetables can grow by hydroponics in that quality of yield, taste and nutritive value of end products is generally higher than the natural soil-based cultivation. This cultivation is cost efficient, disease free and eco-friendly.

## INTRODUCTION

The hydroponics definition states that it is the cultivation of plants in water. It is a subcategory of hydroculture and is a useful technique of growing plants without soil. Through this technique, roots absorb the nutrients present in water and fulfil their growth requirement. Furthermore, through this method, one can grow plants in liquid, sand or gravel by simply adding some nutrients to it. Similarly, residents of cities with limited space are using this method to grow fresh plants in their home and surroundings.

**MATERIAL:** Frame,Growing pipes,Water solution tank, Water pump, Timer, Growing cups, Growing media, Nutrients solutions A andB, Fresh water, TDSmeter, pHmeter, Seeds, Water solution tank.
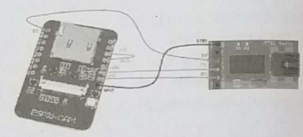
**METHODS:** The first step to a successful hydroponic garden is directly linked to choosing the correct system for the plants that suit best. Now we have used the Media-based systems are based on providing the medium to support the plants and hold nutrient solutions around their roots. Most of these systems operate on timers and nutrients replenishing systems, and systems to drain the water so that the plants can draw in the atmospheric oxygen. These systems are super-efficient because the nutrients are replenished back in the reserves.

## IV Result & Discussion:

The cropsgrown in hydroponics have their own nutrients supply and do not need to compete for root space so, per square yield outputs are high, per unit of time when compared to normal gardening techniques. The plants grow comparatively fast because they get all the essential nutrients easily and in proper quantity.The major advantage is there is no weeding in this method.

## V Conclusion:

In the daily changing advancing world, people need to adapt to new reliable techniques for farming. The Hydroponic system of growing plants is an ultimate technique for the home gardeners which were seeking high yield in a small cultivating space.

## References:

1.Das. A., S. Bhui and D. Chakraborty. 2012. Growth Behaviour of Rose Plants in Low Cost Hydroponics Culture. Journal of Horticultural Science & Ornamental Plants 4(1): 01-06.
2.Hussain, A., K, Iqbal., S. Aziem., P. Mahato., A.K. Negi. 2014. A Review on the Science of Growing Crops without Soil (Soilless Culture) – A Novel Alternative For Growing Crops. Intl. J. Agri. Crop Sci. 7(11): 833-842.

## Physcobiotics

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## Abstract:

This model aims to present a comprehensive analysis of the bidirectional crosstalk between gut microbiota and the central nervous system.

Psychobioticsare special novel class of probiotics showing a significant impact in treating, neuropsychiatric, neurodevelopmental and neurodegenerative disorders, which is leading researchers towards mining of psychobiotics for evolution of novel biomedicine and bio therapeutics in neuroscience.
Keywords: Psychobiotics, Central nervous system, gut bacteria, neurodisorders.

## I Introduction:

Psychobiotics confer mental health benefits to the host when ingested in a particular quantity through interaction with commensal gut bacteria. They are a group of probiotics that affect the central nervous system (CNS) related functions and behaviour's mediated by the gut-brain-axis (GBA) via immune, humoral, neural, and metabolic pathways to improve not only the gastrointestinal (GI) function but also the antidepressant and anxiolytic capacity. The gut-brain-microbiota axis consists of a bilateral communication system that enables gut microbes to interact with the brain, and the latter with the gut. Gut bacteria influence behaviour. both depression and anxiety symptoms are directly associated with alterations in the microbiota.



## II Applications:

Psychobiotics are found to be used as therapeutics in Schizophrenia, as a potential substitute to conventional anxiolytics. Clinical trials on psychobiotics for majordepressive disorder (MDD), early-life stress (ELS) in animal models, therapeutics in Bipolar Disorder, as therapeutics in Parkinson's disease, Alzheimer's disease

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(AD), Tourette syndrome (TS), Attention deficit hyperactivity disorder (ADHD) etc.

## III Conclusion:

Thus there is the possibility that particular probiotic bacteria with psychobiotic properties could relief people with mental and cognitive and health issues. Additional investigations in this area arerequired to define the mechanisms and efficacy ofpsychobiotics in treating various neuro disorders.

## References:

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5.https://www.mdpi.com/2072-6643/12/12/3896

## Stem cells and Tissue Engineering

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1Lecturer in Zoology, 2,3III B.Sc-B.Z.C

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## Abstract:

This model aims to present the importance of Stem cells and tissue engineering in regenerative medicine. Stem cells serve as a repair system for the body. Tissue engineering is an emerging field representing potential alternatives to contemporary solutions. It combines stem cells, scaffolds with suitable growth factors, cytokines and chemokines to improve, replace or regenerate tissues and organs.

## Key words:

Stem cells, tissue Engineering, regenerative medicine, repair system.

## I Introduction:

The spectacular progress in the field of stem cell research has laid the foundation for cell based therapies of disease which cannot be cured by conventional medicines. The indefinite self-renewal and potential to differentiate into other types of cells represent stem cells as frontiers of regenerative medicine. Advancements in gene editing and tissue engineering technology have endorsed the ex vivo remodelling of stem cells grown into 3D organoids and tissue structures for personalized applications. Stem cells pave foundation for all tissue and organ system of the body and mediates diverse role in disease progression, development, and tissue repair processes in host.

To overcome the hurdles associated with stem cell therapy, tissue engineering techniques have been developed. Development of stem cell technology in combination with tissue engineering has opened new ways of producing engineered tissue substitutes. Several studies have shown that this combination of tissue engineering and stem cell technologies enhances cell viability, differentiation, and therapeutic efficacy of transplanted stem cells.



## II Applications:

Stem cells and Tissue engineering has wide applications in various fields like Defence medicine, Cancer, cord blood & cell banking, GI & genecology, skin or integumentary, dental, urology, musculoskeletal, orthopaedics, spine, cardiology & vascular and neurology.

## III Conclusion:

In the near future, the advancements of medical science presume using the combination of

(65)

stem cell and tissue engineering techniques overcomes the limitations of stem cells in treating human diseases, and offers a new path toward regeneration of injured tissues.

**References:**

1.https://www.hindawi.com/journals/ijcb/2016/6940283/

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4. Stem Cells and Tissue Engineering: Past, Present, and Future JULIA M. POLAK AND ANNE E. BISHOP Tissue Engineering & Regenerative Medicine Centre, Imperial College, London SW10 9NH.

## TISSUE ENGINEERING

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### Department of Biotechnology
### Silver Jubilee Government College (A),
### Kurnool, A.P., India

**Abstract:**

This project describes the designing model of Tissue engineering technique and its applications to improve, restore and maintain the damaged tissue or a complete organ as a whole.In this article we will discuss on the tissue engineering which is closely related to biomedical engineering. and regenerative medicine.The need for effective regenerative treatments is on the rise due to rapid aging population, environmental factors and life style disorders like stress, obesity, diabetes and Cases of growth in trauma.

**Key words:**

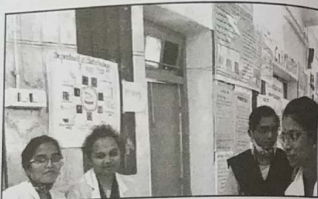Tissue engineering, Engineering tissue architecture, biomedical engineering, Regenerative medicine.

**I Introduction:**

Tissue engineering is an interdisciplinary subject used to create functional 3D tissues combining scaffolds, cells and bioactive molecules. It is the application of science to improve, restore and maintain the damaged tissue or whole organ. Growing potential of tissue engineering procedures in the treatment of damaged tissues is supporting in the market growth. The global tissue engineering the market size was valued at around USD 5 billion in 2016 and is expected to reach USD 11.5 billion by 2022 according to a new report by Grand View Research Inc.The main objective of tissue engineering is to assemble functional constructs that restore, maintain or improve damaged tissues or whole organs as such. The basic principle of tissue engineering is to replace or even improve biological tissues and their functions by the use of engineering methods.

**II Materials:**

Cell sources like IPSCs, adult stem cells, and genetic tools like CRISPR-Cas9 are used as Engineering cells and Growth factors and biomechanics act as Engineering materials.



**III Methodology:**

Engineering tissue architecture include self-assembly of molecules, 3D printing and Decellularized organs. It refers to the practice of combining scaffolds. Cells and biologically active molecules into functional tissues.

**IV Observation and Result:**

This technique can provide solutions that can replace the currently used tissue repair solutions including transplants, surgical reconstruction and mechanical devices. The most key application segments of tissue engineering are cancer, cord blood and cell banking, gynecology, skin or integumentary, dental, Urology, musculoskeletal, orthopedics, spine, cardiology and neurology fields.

**V Conclusion:**

Tissue engineering has evolved from the field of biomaterials development and is continuously evolving assimilating inputs from adjacent scientific areas and their technological advances, including nanotechnology developments.

**References :**

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[2] https://www.verywellhealth.com/tissue-engineering-4580368

## Plant Tissue Culture Technique- A Model

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**Abstract:**

This project describes the designing model of plant tissue culture technique used for commercial production of rare and endangered plants in order to conserve the flora.

**Key words:**

Plant Tissue culture, MS medium, Callus

**I Introduction:**

Plant tissue culture relies on the fact that many plant cells have the ability to regenerate a whole plant (Cellular Totipotency). Single cells, plant cells without cell walls, protoplast pieces of leaves, stems or roots can often be used to generate a new plant on culture media given the required nutrients and plant growth hormones.

The basic principle of plant tissue culture is to produce plants that are genetically similar to a parent plant. For this purpose "explant"[small dissected part of a plant] is used for tissue culture to develop it into a whole plant.

**II Materials:**

An explant of any required production of the plant to develop it into a whole plant. Surface sterilizing agents like ethanol, mercuric chloride and Sodium hypochlorite were used for disinfection of the explant. Murashige and Skoog Medium and 2,4- D as plant growth hormone were used for tissue culture technique to produce whole plants and then they are transferred to green house.



**III Methodology:**

An explant from the desired plant was taken and surface sterilized with sodium hypochorite.500 ml of MS medium was prepared and to it 5 gm of agar was added and kept in an autoclave for sterilization of the medium. To this stock solution growth hormones were added based on the required portion of growth of the plant. 2-3 drops of 2,4- D was used here as plant growth hormone. The explant was inoculated into the medium and incubated in the Tissue culture room at 28 degrees C for 10-15 days for callus formation.

**IV Observation and Result:**

After 15 days of incubation, Callus formation was observed. From the callus within three weeks shoot formation was observed and within 6 weeks of time root formation was observed. The Whole plant obtained was acclimatized to greenhouse conditions and then transferred to fields.

**V Conclusion:**

This technique is most widely used in commercial production of plants used in potting,

landscape and floristic studies. It is also used to conserve rare or endangered plant species, to cross distantly related species by protoplast fusion and regeneration of the novel hybrid, to produce identical sterile hybrid species can be obtained and also to produce clean plant material from stock infected by viruses or other pathogens.

### References :
[1] Sathyanarayana, B. N.(2007). Plant Tissue Culture: Practices and New Experimental Protocols. I.K.International. pp.106-120. ISBN: 978-81-89866-11-2.

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## Development of an Automation Control Application (Arduino) For A Bioreactor System

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### Abstract:
The miniaturised bioreactor is designed in a multi parallel setup suitable for Arduino control application that can sufficiently control, monitor, and visualise process parameters while being less expensive than the currently known control systems for bioreactors.The first part of the project consisted of analysing the setup of the miniaturised bioreactor system and identifying relevant process parameters that could be controlled, monitored, and visualised. The second part of the project is to acquire the necessary Arduino parts to realise the physical aspect of the control system.

The Arduino parts were chosen by specifying whether the parts were inputs or outputs and what function the Arduino parts should full fill within the control system.
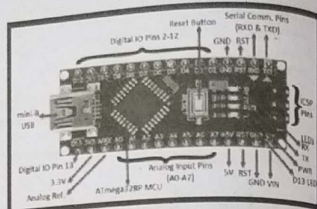


Fig 1: Arduino nano

The system was designed to allow multiple communication with user by recording the data in Real time, storing the acquired data in ThingSpeak Cloud, incorporating an alarming system (piezo buzzer) together with an LED indication mechanism and an IOT.

### I. Material & Methods:
#### a. Software Specifications:
Arduino Compiler and MC Programming Language: C
#### b. Hardware description:
The Arduino Nano is a small, complete, and bread board-friendly board based on the ATmega328 (Arduino Nano 3.x). It has more or less the same functionality of the Arduino Duemilanove, but in a different package. It lacks only a DC power jack, and works with a Mini-B USB cable instead of a standard one.

### II.Applications:
This technology has application in wastewater treatment, cell culture, and tissue engineering in healthcare, production of high-value pharmaceuticals and bulk chemicals in industrial biotechnology, and even cultivation of algae for oxygen generation in space exploration. (68)

### III. Discussion
The results of this project show that Arduino is a usable tool to monitor, control, and visualize the relevant process parameters of a miniaturized bioreactor system. Tests in a simulated environment have been performed to validate this argument. The results of this project can also be compared with other examples of control systems and control software.

### IV.Conclusion
The results of the report show that Arduino is suitable for monitoring relevant process parameters of a miniaturised bioreactor. Due to ongoing evolvement in the biotechnology area, the demand for various applications actively increases the progress in bioreactors structures. One of the latest developments in bioreactor structures is the micro bioreactor system.

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## Plastics degradation by microbes: A sustainable approach

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### Abstract :
Plastics play an important part in every sector of economy all over the world due to their extensive use inagriculture, building and construction, health and consumer goods. They are used in the manufacturing of different products including defense materials,sanitary wares, tiles, plastic bottles, artificial leather and different other household items. Plastics are alsoused in packaging of food items, pharmaceuticals, detergents, and cosmetics. Excessive use of plasticsposes a serious threat to the ecosystem and human life on the planet.  There is a need to use adequate biodegradablemethods in order to reduce plastics burden from the environment. The present review focuses on the types of plastics on the basis of thermal and biodegradable nature, degradation and biodegradation types, types of degradable plastics, characterization of biodegradation, and factors affecting biodegradation.

### I Analytical procedures for biodegradation
A wide variety of methods is currently available for measuring the biodegradability of polymeric materials. Several test methods to assess the potential biodegradability of plastics have been developed by International Standard Organization (ISO) and American Society for Testing and Materials (ASTM)

including gas chromatography/-mass spectrometry (GC–MS), stereomicroscopy and micro-Fourier transform infrared spectroscopy (m-FTIR) (69)

Biodegradation can be characterized with loss of weight, change in tensile strength, change in dimensions, change in chemical and physical properties, carbon dioxide production, bacterial activity in soil and change in molecular weight distribution.

### II Enzymatic degradation of plastics

For polymers degradation different enzymes are used e.g. laccase, manganese dependent enzymes (lignin degrading enzymes), urease, lipase, and protease. Thermostable laccase can degrade the polyethylene (PE) in 48 h of incubation at 37 °C

### III Characterization of plastic biodegradation

All polymers are not dissolved in water but water-soluble polymers are easily degraded and converted into alcohol, ketones, and acids. There are some

### IV Conclusions:

The transfer of plastic polymers from the waste into the aquatic ecosystem including rivers and oceans through different processes and the strategy to shift these polymers from the wastewater to a suitable place for deposition/incineration should properly be advocated. Long-term coordinated cleanup operations are needed to evaluate the progressive ecosystem effects.
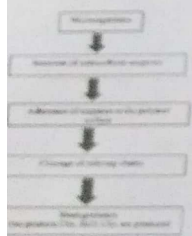
mechanism of enzymatic biodegradation of ...lymers

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## Irrigation Methods in Orchard

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C.Lakshmi Sirisha

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### Abstract

There are different ways of application of irrigation water to the farm land known as irrigation methods. The commonly used irrigation methods are surface, sprinkler, and drip irrigation. Each method has its own merits and demerits, depending on the soil, topography, type of crops, climate, water availability and quality, and investment.

I Introduction: The irrigation method is commonly influenced by water availability, soil type, topography, climate, crop or orchard type, labor availability and type, energy, and the

relative cost of each resource. The critical parameters in irrigation method are initial cost, maintenance and operation costs, and irrigation efficiency.

II Material: Soil, water, different types of crops, tools, labour

III Method :

The different irrigation methods employed for irrigating crops are surface (border and furrow), sprinkling, and drip irrigation. Surface or gravity fed irrigation where a water stream is diverted to the field is good for crops.

IV Result&Discussion: Conventionally fruit and crop cultivators used flooding irrigation method in which the water is made to cover the entire surface of the soil. This method results in the wastage of water due to water is supplied to the entire field though the fruit and crops grown in limited area. There is no control over the quantity of water to be supplied as per the needs of the growing fruit crops at different stages and seasons. Flooding irrigation not only causes water loss but also has the disadvantages, as the water is available in the interspaces of fruit plants, the weeds grow abundantly resulting in the depletion of soil nutrients and hindering the proper growth of the plants. They also act as carriers or hosts for different pests and diseases. To save the water and overcome the above disadvantages modified irrigation methods like Furrow, Basin, Check basin and Ring basin are useful.

### V Conclusion:

Static models of the different irrigation methods have been prepared by using the clay as shown in the photographs. The clay soil is lightly moistened and made the main irrigation channels, sub-channels, beds and basins in the respective models. The twigs of the fruit plants are placed in the rows in furrow and basin models, in the square beds in check basin model and in rings in the case of ring basin model. The advantages and the type of method to be used depending on the growing stage

of the fruit and crop plants are explained to the visitors by the students.

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## ELISA

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### Abstract:

The method was first introduced by Engvall and perlmann. ELISA technique however can be used for a quantitative determination of the concentration of a certain antigen. The principle of ELISA also called double antibody sandwich technique.

Keywords:

Polychlorate, plate or polyvinylchloride, horseradish peroxidase, Alkaline phosphatase

## 1.Introduction:

The enzyme linked immune sorbentassay(ELISA) is one of the primary and most popular method to detect and measure the signaling of protein.The ELISA test is rapid and simple to perform and is one of the most sensitive and reliable technologies available.

## 2.Materials:

Polystyrene plate, Horse Raddish Peroxidase enzyme and alkaline phosphatase, antibody,antigen and buffer.

## 3.Methodology:

ELISA is based on specific antigen antibody reaction and usually involves immobilizing antibodies and antigens to a 96-well plate 384 well plate.The basic

### Steps of ELISA

Immobilization of the target proteins/antigens on the surface of a microplate.

Washing unbound /excess proteins/antigens from the plate .

Washing unbound(excess) antibodies of the plate. Adding a labelled antibody which will subsequently bind the target antigen/protein present in the plate Adding enzyme specific substrate that will react with the enzyme and produce a colour product which can be measured calorimetrically using a microplate reader.



## 4.Observation and Result:

The second antibody is linked with an enzyme. The enzyme speeds up a chemical reaction and in the final step a substance reacts with an enzyme on the antibody is added t produce a coloured product. If the test is positive then the coloured reaction occurs.

## 5.Result:

ELISA test can detect and measures antibodies in your blood. It include hormones, allergen, viral antigens infection(dengue fever), bacterial antigens(TB) and antibodies that the body has made in response to infection( antibodies to hepatitis).

### References:

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## Erythroblastosis Foetalis

1. K Aruna Kumari, Lecturer in Bio-Chemistry

Students : 2. Kundana   3. Divya   4. K. Sukanya   5. B. Aishwarya

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### Abstract:

Erythroblastosis foetalis represents a significant hazard for successful management of pregnancy and blood group incompatibility

### Keywords:

Blood groups, Erythroblastosis ,Rhesus monkeys Transplacental transfer, Rh factoR

## I. Introduction:

Erythroblastosis fetalis is hemolytic anemia In the fetus (or neonate, as erythroblastosis neonatorum) caused by transplacental transmission of maternal antibodies to fetal red blood cells. The disorder usually results from incompatibility between maternal and fetal blood groups, often Rho(D) antigens.

## II Materials:

R.B.C in a Pregnant Woman's blood, Rh incompatibility

(72)

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## III Methodology:

Erythroblastosis foetalis, also called hemolytic disease of the newborn, type of anemia in which the red blood cells (erythrocytes) of a fetus are destroyed in a maternal immune reaction resulting from a blood group incompatibility between the fetus and its mother.

## IV. Observation and Results:

when the Rh factors in the mom's and baby's mother blood doesn't match. If the Rhnegativeimmune system will make antibodies to attack her baby When the antibodies enter your baby's blood stream.they will attack the red blood Cells causing them to break down

## V Conclusion:

Injections of a medicine called Rh immune globulin can keep your body from makingRh antibodies. It helps prevent the problems of Rh incompatibility. If treatment is needed for the baby, it can include supplements to help the body to make red blood cells and blood transfusions.

### References:

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## Fibonacci Sequence, Golden Ratio and Pythagoras Triplets

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### Abstract:

In this Project we first introduce Fibonacci sequence and use it to describe the ideas of Golden Ratio-its presence in nature, its significance in day-to-day life - general formula to get Pythagoras triplets from Fibonacci sequence.

### Keywords: *Fibonacci sequence, Golden ratio, Pythagoras triplets.*

## I Introduction to Fibonacci Sequence:

Fibonacci sequence is a sequence of natural numbers defined recursively as $f_0 = 0$, $f_1 = 1$, and $f_{n+1} = f_n + f_{n-1}$ and thus the first few terms of Fibonacci sequence are: 0,1,1,2,3,5,8,13,21,34,___

## II Golden Ratio:

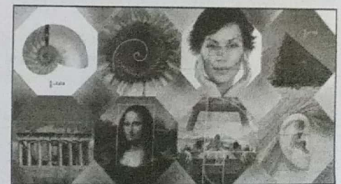If we consider ratio of the successive terms of Fibonacci sequence as given below:

$$s_1 = \frac{f_2}{f_1} = 1, \quad s_2 = \frac{f_3}{f_2} = \frac{2}{1} = 2, \quad s_3 = \frac{f_4}{f_3} = \frac{3}{2} = 1.5, \quad \ldots$$

$$s_{11} = \frac{f_{13}}{f_{11}} = \frac{144}{89} \approx 1.617978, \quad s_{12} = \frac{f_{13}}{f_{12}} = \frac{233}{144} \approx 1.618055 \ldots$$

we can observe that these ratios gradually converge to a real number approximately equal to 1.618 which is often described as Golden ratio and is denoted by $\varnothing$.

## III Importance of Golden Ratio:

The Golden ratio can be found everywhere in the nature right from branching of plants, formation of sea shells, human physiology and so on that adds beauty or aesthetics to these objects. That is why people from ancient times have been using the concept of Golden ration in their designs and creative arts. We can find the presence of Golden ratio in Pyramids of Giza, Parthenon temple of Greece, Taj Mahal of Agra, Monalisa of Leonardo Da Vinci, and even logo designs of famous multinational companies like Pepsi, Twitter etc.



## IV Pythagoras triplets:

Everyone is familiar with the famous Pythagoras theorem which states that, "In a right-angled

(73)

triangle, if 'a' and 'b' are lengths of two sides and 'c' is the length of hypotenuse then $a^2 + b^2 = c^2$". The triple (a, b, c) is called Pythagoras triplet. For example, (3, 4, 5) is a Pythagoras triplet. There are different methods to construct Pythagoras triples which are infinite in number. For instance, if we multiply every component of Pythagoras triplet (3, 4, 5) with a positive integer 'k' the resultant (3k, 4k, 5k) is also a Pythagoras triplet. But it is an interesting fact that Fibonacci sequence also can be used to form these Pythagoras triplets.

If $f_n$ an 'nth term' of Fibonacci sequence and $f_{n+1}$, $f_{n+2}$ and $f_{n+3}$ are its immediate successors then,

$$(f_n \cdot f_{n+3}, \; 2f_{n+1} \cdot f_{n+2}, \; f_{n+1}^2 + f_{n+2}^2)$$ is a

Pythagoras triplet. For instance, when $f_n = 2$, $f_{n+1} = 3$, $f_{n+2} = 5$, $f_{n+3} = 8$, we get the Pythagoras triplet (16, 30, 34). In this way we can find many triplets that satisfy Pythagoras theorem.

## V Conclusion:

We have discussed only two concepts namely, Golden ratio and Pythagoras triplets that can be derived from the Fibonacci sequence. The Golden ratio is taken here not only to demonstrate aesthetic beauty but also the intellectual beauty involved in it and same is the case with Pythagoras triplets. The idea to promote here is by encouraging learners to study Fibonacci sequence which is a rich source of knowledge, and the inter relationship among the terms of the sequence. They can think in multiple directions to explore and come up with other interesting concepts that can be derived from the Fibonacci sequence.

## References :

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Notes on Number Theory and Discrete Mathematics, Vol.23,2017.

# The Konigsberg bridge problem in Graph Theory

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## Abstract:

The Konigsberg bridge problem was an old puzzle which concerns with the possibility of finding "a path over seven bridges passing through every one of the seven bridges exactly once and come back to the starting point without swimming across the river ".
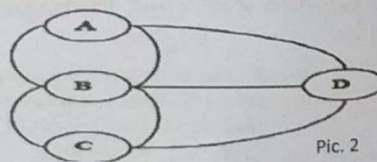
## Key words:

Graph, Vertices and Edges.

## I Introduction:

The picture 1.1 shows the Seven bridges on the river Pregel in Konigsberg city, Russia. The river divides the city into four land areas A, B, C and D.
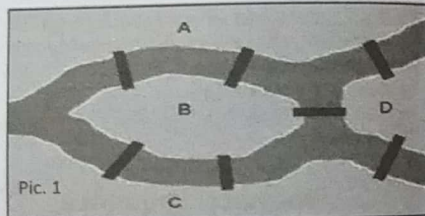


Pic. 1



Pic. 2

The problem was to devise a walk through the city that one would cross each of those bridges once and only once. In 1735, a Swiss Mathematician Leonhard Euler solved this problem. He provided a solution to the problem and finally concluded that such a walk is not possible. Euler represented the given situation using a graph as shown in (74)

picture 1.2. In this graph, Vertices represent the land-masses and Edges represent the bridges.

**II Materials:** Three thermo coal sheets, Charts, Gum/Fevicol , stick.

**III Methodology:** Students explained the problem through the model of Seven bridges on the river and with a graph of that drawn separately on a chart. Also, displayed a sheet that containing the points of the importance of graphs in all fields of sciences and Technology.



**IV Points are notified from the project:** When a vertex is visited during the process of tracing a graph, (i) there must be one edge that enters into the vertex. (ii) There must be another edge that leaves the vertex. Therefore, order of the vertex must be an even number. Based on this observation, it was discovered that tracing a graph depends on the number of odd vertices present in the network whether any network is traversable or not.

Euler found that only those networks are traversable that have either-no odd vertices (then any    vertex may be the beginning and the same vertex will also be the ending point) or exactly two odd vertices (then one odd vertex will be the starting point and other odd vertex will be the ending point).

## V Conclusion/Solution:

If the citizens of Konigsberg build an eighth bridge from A to C, then- It would be possible to walk without traversing any bridge twice. And the problem laid the foundations of graph theory and prefigured the idea of topology. If there is even degree for each vertex of the graph, then the problem of the kind Konigsberg's Seven bridges has the solution.

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2. Principle and practices of bridge Engineering by S.P. Bindra.

# Silver Jubilee Government College (A), Kurnool, A.P., India

# NATIONAL SCIENCE DAY EXHIBITION



Dept. of Microbiology displaying Exhibits



Bio-Technology Students displaying live projects



Prof. DVR Sai Gopal Garu, Vice-Chancellor Cluster University viewing IoT exhibits displayed by Comp. Science Dept.



Dept. of Botany displaying exhibit on Hydroponics



Prof. DVR Sai Gopal Garu, Vice-Chancellor Cluster University viewing exhibits displayed by Zoology dept.