



Department of Biotechnology
University College of Engineering
BIT Campus, Anna University
Tiruchirappalli – 620 024

BIT – BioTalks

Department Newsletter



Biology is the most powerful technology ever created. DNA is software, protein is hardware and cells are factories - Arvind Gupta

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VISION AND MISSION

THE INSTITUTION

Vision

To transform students into competent professional and responsible citizens by focusing on assimilation, analysis, synthesis and dissemination of knowledge to meet the societal needs.

Mission

- ✚ Impart quality education to meet the needs of the profession and society.
- ✚ Attract and develop talented and committed human resource and provide an environment conducive to innovation and research.
- ✚ Facilitate effective interactions among faculty, students, premier educational Institutions, R&D laboratories, industries, alumni and other stack-holders.
- ✚ Practice and promote high standards of professional ethics, transparency and accountability and team spirit and entrepreneurial skills.

THE DEPARTMENT OF BIOTECHNOLOGY

Vision

To develop technical manpower in biotechnology to enhance the knowledge and skill to solve problems and challenges countenanced by the industry and academia for betterment of the society.

Mission

- ✚ To provide an academic environment that emphasizes critical thinking.
- ✚ To encourage intellectual depth and creativity of the students.
- ✚ To establish institute industry interaction through projects and training.
- ✚ To promote the students to adhere professional ethics and safety consideration for the societal benefits.
- ✚ To motivate the students to pursue higher studies in various spheres of technology.

PROGRAMME EDUCATIONAL OBJECTIVES

- To enable the students to formulate, analyse and solve issues in various areas of biotechnology.

- To apply the acquired knowledge to cater the needs of the academia, research and industry.
- To develop ethical quality among the students for providing constructive service to the society.
- To emphasize the value of continuous learning to face the challenges in professional career.

PROGRAMME OUTCOMES

Upon completion of the Bachelor in Biotechnology program, graduates will be able to:

- ✚ Apply knowledge of mathematics, science and engineering to biotechnological-problems.
- ✚ Generate hypothesis, design and conduct experiments, interpret and analyse data, and report results.
- ✚ Design systems and process to find solutions for biotechnological problems to meet the needs of society.
- ✚ Employ research skills to investigate, design, conduct experiments and interpret the data to arrive valid conclusions.
- ✚ Use of biological concepts and appropriate techniques to find solution for the problems.
- ✚ Recognize the moral and social values to appreciate the need for ethical standards and professional codes of conduct.
- ✚ Appreciate the contribution of biotechnology to maintain the quality of environment and sustainability of life.
- ✚ Demonstrate adherence to accepted standards of professional ethics and responsibilities.
- ✚ Work independently and function effectively as a member or leader of a team.
- ✚ Develop the verbal and written communication skills relevant to professional-position.
- ✚ Create entrepreneurial and managerial skill for the implementation of multidisciplinary projects.
- ✚ Possess skills necessary for life-long professional learning

PROFILE

The Department of Biotechnology was started in the year 1999 with a vision to develop technical manpower in the wide area of biotechnology. It is a DST-FIST Sponsored

Department and is offering B. Tech., M. Tech., and Ph. D. degree programmes in Biotechnology. The department has many laboratories equipped with advanced instruments like Quantitative Real Time PCR, Multimode Detector, G-PCRs, HPLC, GC, UV-Vis spectrophotometers, Fermentor, CO₂ and Multi-gas incubators, Gel Documentation system, Fluorescent Microscopes, DNA Sequencer, Electroporator, Plant Growth Chamber, Rotary Evaporator, Bio-safety Cabinet (Class II) and facility for plant tissue culture. Currently, our department is strengthened by 13 well qualified faculty members from diverse fields and specializations. Several research projects funded by various national funding agencies like DBT, DST, DRDO, ICMR, and UGC have been carried out by our faculty members. Our department has been funded by AICTE for the establishment of Computational Biology and Bioinformatics laboratory under MODROB scheme.

ACADEMIC ACTIVITIES

- ✚ **Dr. Maheshwari AS** published a book chapter on Coral Reefs in Tamil, Kalanjium Magazine, Anna University-CDTET Publications, 4, 20, 03 – 10, 2020.
- ✚ **Ms.Jenitta E** participated the International Webinar titled on “COVID-19-Role of public health scientist : From clinical samples to sequencing” held on 15-07-2020.
- ✚ **Ms.Gayathri J** participated the International Pharma Webinar series-2020 on “Drug discovery from medicinal plants : current trends and Future Perspective” held on 07-06-2020.
- ✚ **Ms.Priyadharshini S** participated the two days Webinar on “Future Perspectives in Biotechnology” held on 11-06-2020 to 12-06-2020.
- ✚ **Ms.Priyanka K** participated in the Webinar on „Life with Natural Products“ held on 22-05-2020.
- ✚ **Ms.Narmatha K** was successfully completed her project internship on “Computer aided targeting of Coumarin nanofiber for the treatment of endometriosis” during her internship period from 01-10-2020 to 30-11-2020.

SCIENCE EVERYWHERE

Organ Printing

- Parkavi C, B. Tech. (IV year)

In today world, so many people losses their organ function because of disease, accidents and due to their smoking and drinking activities. So these people need a functioning organ for them survive but in today world donors are not much available to fulfil the need. For fulfilling the need, the modern world arises with more technologies. Organ printing is one of the technology for fulfilling the need of functioning organ.

What is organ printing?

It is a technique where computer model of organ is fed into a printer that lays down successive layer of bioplastics along with live human cells, until the 3D structure of organ is completed. Human cells are collected from the patients' organ. Bioplastics form scaffolds that act as skeleton for the organ that is being printed. After printing, the organ is transferred to an incubation chamber to give the cells time to grow. After grown, the organ is implanted into the patient.

How it fulfils the need?

Even the organ is available, rejection of transplants take place due to genetic variation. So, by using that organ printing technology, we can produce genetically identical organ which can easily accepted by the body.

What are the difficulties why does it still not come to day to day aspects?

One of the difficulties of 3D printing organs is recreating the vasculature required to keep the organs alive. Designing a correct vasculature is necessary for the transport of nutrients, oxygen, and waste. Blood vessels, especially capillaries are difficult due to the small diameter. It is difficult to replicate the entangled networks of airways, blood vessels, bile ducts and complex geometry of organs.

These difficulties faced in the organ printing field extends beyond the research and development of techniques to solve the issues of Multi vascularization and difficult

geometries. Before organ printing can become widely available, a source for sustainable cell sources must be found and large scale manufacturing processes need to be developed.

Additional difficulties include designing clinical trials to test the long-term viability and biocompatibility of synthetic organs. While many developments have been made in the field of organ printing, more research must be conducted. Because of these difficulties that technology has not come to day to day aspects.

Blue Brain technology

- Gayatri J, B. Tech. (IV year)

Human brain, the most valuable creation of God. The man is called intelligent because of the Brain, but we loss the knowledge of a brain when the body is destroyed after the death.

Blue Brain

- ✚ The name of the world’s first virtual brain. That means a machine that can function as human brain.
- ✚ IBM developing the “Blue brain”.
- ✚ IBM, in partnership with scientists at Switzerland’s Ecole Polytechnic Federal De Lausanne’s (EPFL) Brain and Mind Institute will begin simulating the brain’s biological systems.
- ✚ NEWS: The EPFL Blue Gene was the 8th fastest supercomputer in the world.

Blue Brain project objectives

- The project will search for insights into how human beings think and remember.
- Scientists think that blue brain could also help to cure the Parkinson's disease.
- The brain circuitry is in a complex state of flux, the brain rewiring itself every moment of its existence. If the scientists can crack open the secret of how and why the brain does it, the knowledge could lead to new breed of supercomputers.

What is virtual Brain?

- A machine that can function as brain.
- It can take decision, think and response.

- It can keep things in memory.

Why we need virtual Brain?

- To upload contents of the natural brain into it.
- To keep the intelligence, knowledge and skill of any person for ever.
- To remember things without any effort.

Functioning of Brain

- ✓ **Sensory Input:** Receiving input such as sound, image, etc through sensory cell.
- ✓ **Interpretation:** Interpretation of the received input by the brain by defining states of neurons in the brain.
- ✓ **Motor Output:** Receiving of electric responses from the brain to perform any action.

Softwares

The Blue Brain Project has developed a number of software to reconstruct and to simulate the mouse brain.

BluePyOp

BluePyOp is a tool that is used to build electrical models of single neurons. For this, it uses evolutionary algorithms to constrain the parameters to experimental electrophysiological data. Attempts to reconstruct single neurons using BluePyOp are reported by Rosanna Migliore, and Stefano Masori. It is an open source software and available for everyone on GitHub.

CoreNEURON

CoreNEURON is a supplemental tool to NEURON, which allows large scale simulation by boosting memory usage and computational speed. It is an open source software and available for everyone on GitHub.

NeuroMorphoVis

NeuroMorphoVis is a visualisation tool for morphologies of neurons. It is an open source software and available for everyone on GitHub.

SONATA

SONATA is a joint effort between Blue Brain Project and Allen Institute for Brain Science, to develop a standard for data format, which realises a multiple platform working

environment with greater computational memory and efficiency. It is an open source software and available for everyone on GitHub.

Examples of Blue Brain

- A very good example of utilization of blue brain is the case "short term memory".
- In some movies we might have noticed that a person might be having short term memories.
- A another situation is that when a person gets older, then he starts forgetting or takes a bit more time to recognize to a person.
- For the above reason we need a blue brain. It is a simple chip that can be installed into the human brain for which the short term memory and volatile memory at the old age can be avoided.

Advantages

- Remembering things without any effort.
- Making decision without the presence of a person.
- Using intelligence of a person after the death.
- Understanding the activities of animals.

Disadvantages

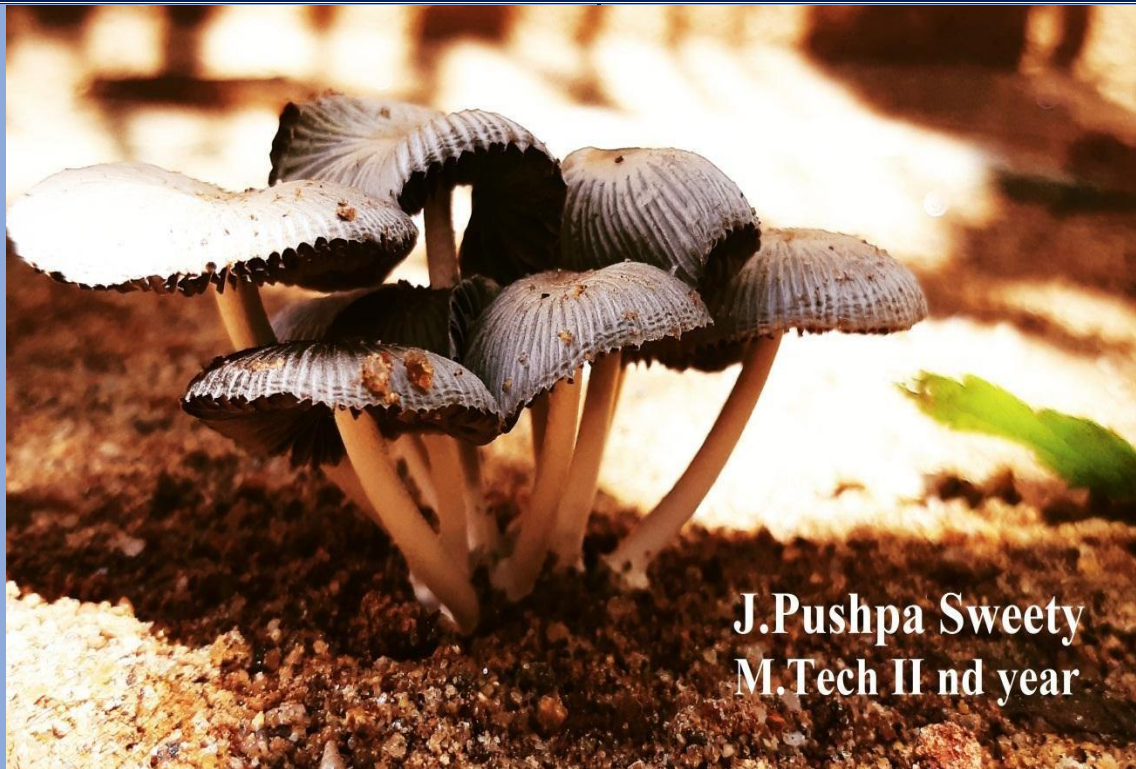
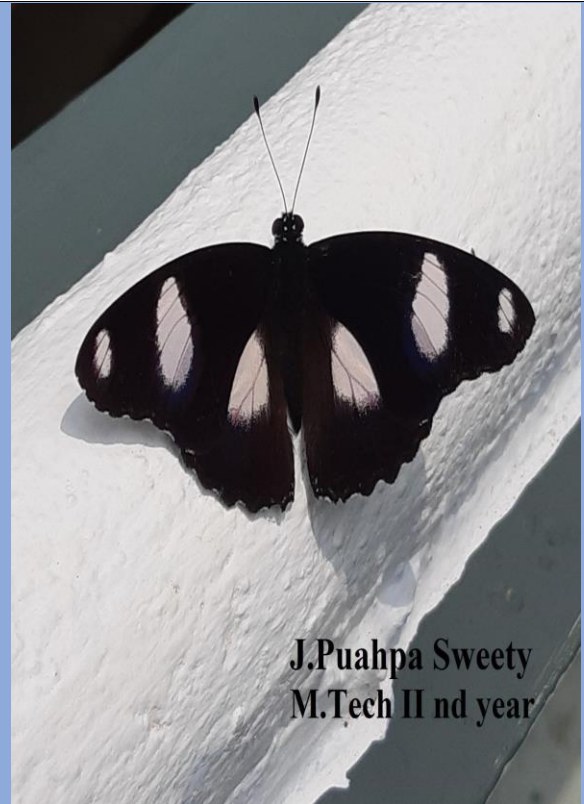
- We become dependent upon the computer.
- Others may use technical knowledge against us.
- Another fear is found with respect to human cloning.
- A very costly procedure of regaining the memory back.

References

- ✓ <https://en.m.wikipedia.org/wiki/bluebrainproject>
- ✓ <https://www.technologynetworks.com>

ART GALLERY

PHOTOGRAPHY





G.Venkatesh
B.Tech IV year

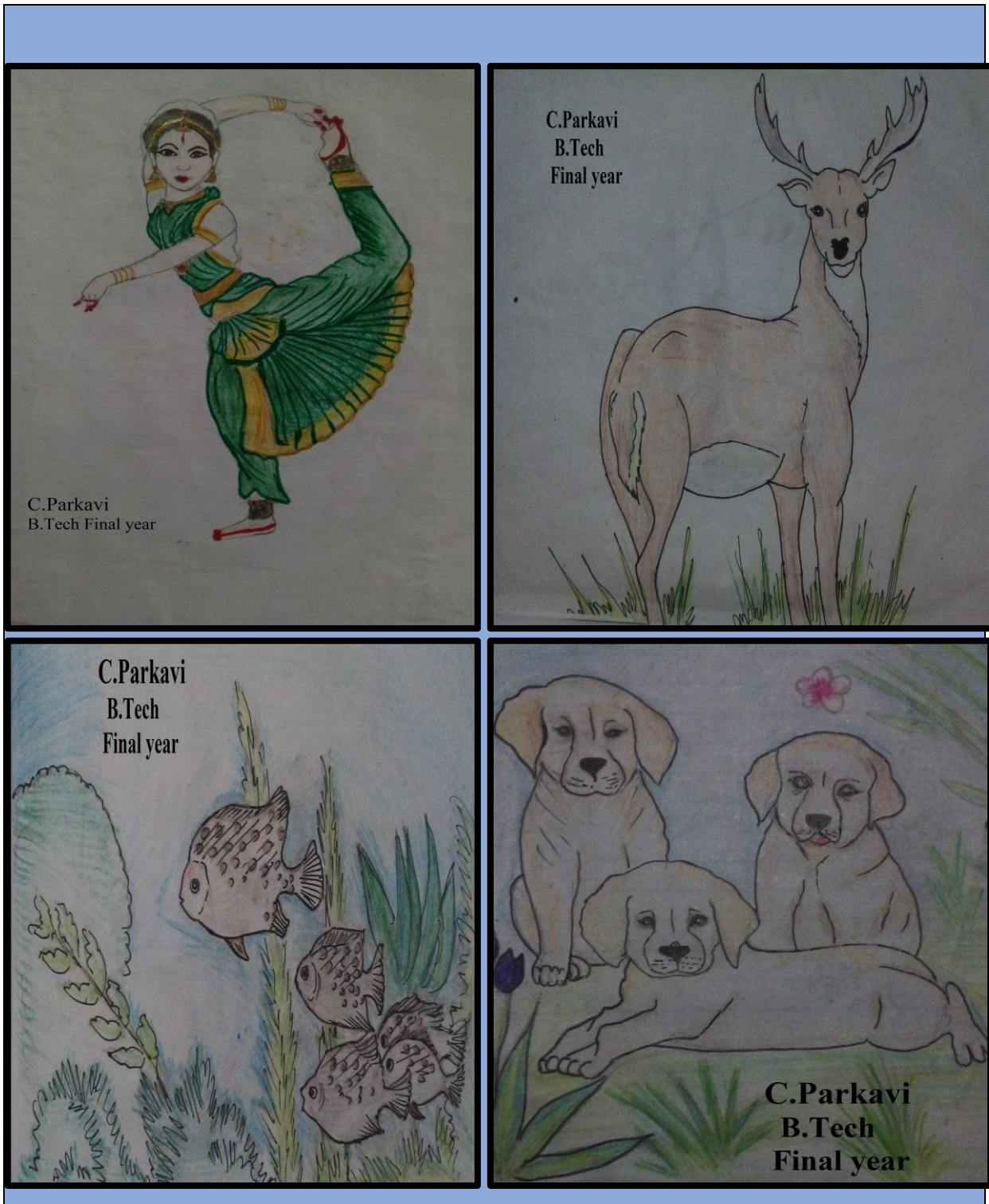
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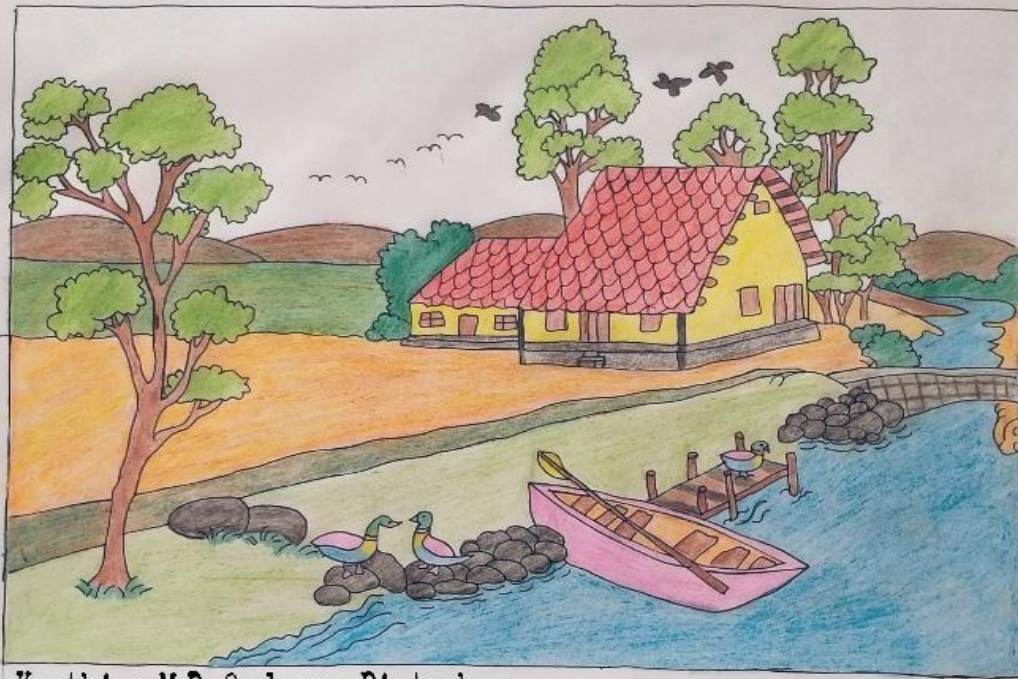


G.Venkatesh
B.Tech IV year

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PAINTINGS





Karthiga M D, 2nd year Biotech



K.Priyanka
B.Tech IV th year



HANDICRAFTS





PENCIL ARTS



POETRY

* நட்பு எனும் புயலில் சிக்கிய நண்பர்களுக்காக....

நச்சு நிறைந்த மூடுபுகையென நினைத்தேன்

மென்மையான மேகங்களாய் உருவெடுத்தாய்

கானல் நீரென நினைத்துப் பதரினேன்

கடல் நீராக மனமெங்கும் பாய்ந்தாய்

திடுக்கிடும் இடிமின்னல் எனத் தடுமாறினேன்

வானுயர்ந்த விண்மீன்களாய் நம்பிக்கை அளித்தாய்

இதேபோல் இன்னும் பல வண்ணங்களை

என் வாழ்வில் அரங்கேற்ற....

இருளிலும் தூய்மையான வெளிச்சத்தை

எண்ணிரு கண்களால் உணர நீ என்னுடன் வருவாயாக.....!!!

* உறவைத் தேடும் உள்ளங்களுக்காக.....

உரையாடும் நேரம் குறைந்தாலும்

உறவாடும் காலங்கள் காத்திருக்கின்றன.

* இவ்வுலகில் நிலையான இரு உறவுகள்....

உலகில் உள்ள அனைத்துக் காதலையும்

ஒரே இதயத்திலிருந்து நீ உணரவெண்டுமென்றால்

உன் தாயிடம் செல்...!!

சுத்தமான அன்பு கிடைப்பது வரம்

எனக்கு வரம் கூட எளிதில் கிடைத்துவிட்டது

என் தந்தை வடிவத்தில்....!!!

* நான் நேசித்த இதயம்....

அன்பும் மரியாதையும் குணமும் உடையவரென

நாம் நினைத்த ஒருவரின் ஒவ்வொரு கடுமையான

சொல்லும் நமக்குக் கண்ணீராகத்தானே வெளிப்படும்....!!

* என்னை சூழ்ந்த சூழ்நிலைகள்....

தன்னம்பிக்கை தராத தைரியத்தைக் கூட

உன்னால் எனக்கு தாராளமாக தர இயன்றது.

- M. Aruna, B. Tech. (III year)

With Thanks...

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Biotechnology Student Association

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