



Hindusthan

College of Engineering and Technology

An Autonomous Institution



A

DEPARTMENT OF CIVIL ENGINEERING

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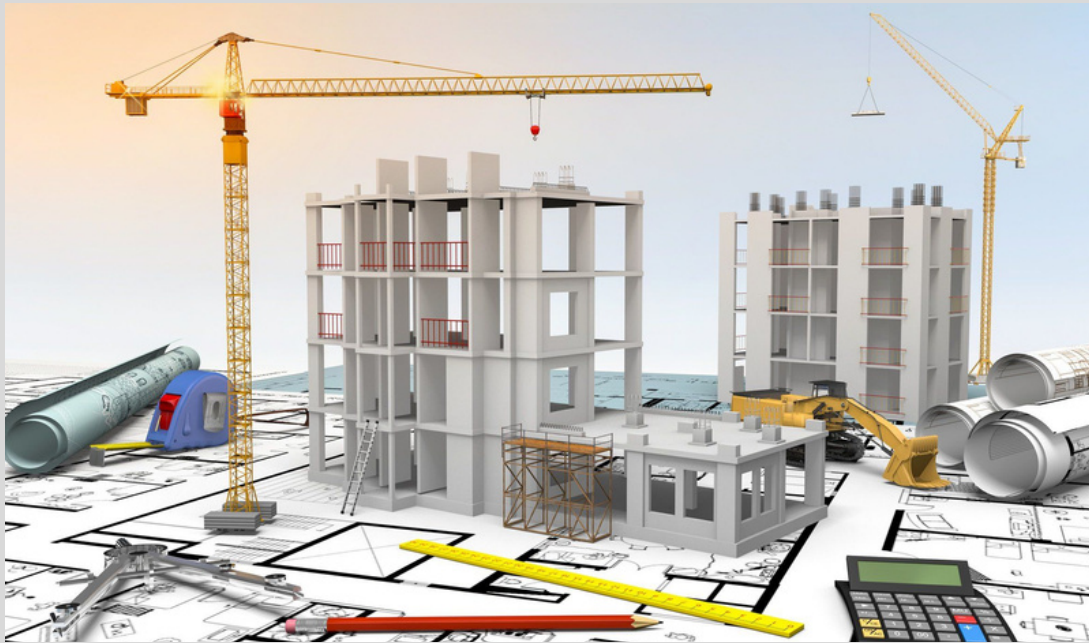
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VISION OF THE DEPARTMENT

To be recognized globally for pre-eminence in Civil Engineering education, research and service.

MISSION OF THE DEPARTMENT

- **To impart scientific and technical knowledge for professional practice, advanced study and research in Civil Engineering.**
- **To equip the students with ingenious leadership and organizational skills for a successful professional career.**
- **To inculcate professional and ethical responsibilities related to industry, society and environment.**



PROGRAM EDUCATIONAL OBJECTIVES (PEO)

To produce graduates with the ability to

- **Excel as practicing engineers, academicians and researchers with a comprehensive knowledge in Civil Engineering.**
- **Play a significant role as team players and leaders in challenging environments for nation's infrastructure development, environmental protection and sustainability.**
- **Uphold professional and ethical responsibilities as engineers, consultants and entrepreneurs while addressing the demands of the society.**

PROGRAMME SPECIFIC OUTCOMES (PSO)

The graduates will be able to:

- **Apply their engineering knowledge, communication skills, professional and ethical principles to solve problems in civil engineering and contribute to the infrastructure development in a sustainable way.**
- **Use their engineering background to excel in competitive exams for advanced study, research and professional career.**

Green Construction

INTRODUCTION

Green construction refers to the philosophy and processes that makes the creation and usage of the built environment as friendly to the natural environment as possible. From the design stage to assembly to the functionality of the structure upon completion, green construction focuses on reducing negative impacts to the planet and even adding some positive benefits.

Construction is a necessary part of modern life – humans need homes to live in, schools to learn in, businesses to work at and roads to drive on. Any construction will have some inevitable impact on the environment. With a growing global emphasis on sustainability, it is the responsibility of the construction industry to take steps to both minimize their own footprint in raising a new building as well as designing that building to operate in a sustainable way for many years to come.



Green Construction

Green construction is the answer to that call and is a rapidly growing aspect of the industry.

The first step in construction is design. Architects and engineers work to create blueprints and plans for the new building and the property it stands on. This is where the layout of the building, the outward appearance of the building, and all the systems and components that make up the structure are sketched out and prepared to be put into action.

This design stage is one of the most important for green construction because this is where decisions are made about what type of features should be included in the new project and the sustainable steps to take to execute the build. Everything from the electrical and water systems inside to the landscaping outside can have a hand in the green status of the building, and the designers are the ones who create the instructions for the builders.

Environmental architecture and environmental design are actually the top “green degrees” offered by colleges and universities nationwide. Today’s students hold the environment as one of their top concerns for the future, so many are pursuing careers in sustainability. As more designers receive training in green architecture, that influence will continue to fuel the steps toward a greener construction industry.

One of the aspects of construction that has the biggest negative impact on the environment is the processing of building materials. Creating the wood, steel, concrete and other materials used in construction can cause deforestation, pollution, carbon emissions and other harmful effects.

To minimize this impact, green construction can look at the materials they use and how they are sourced, processed and disposed of to make more environmentally friendly choices.

Green Construction

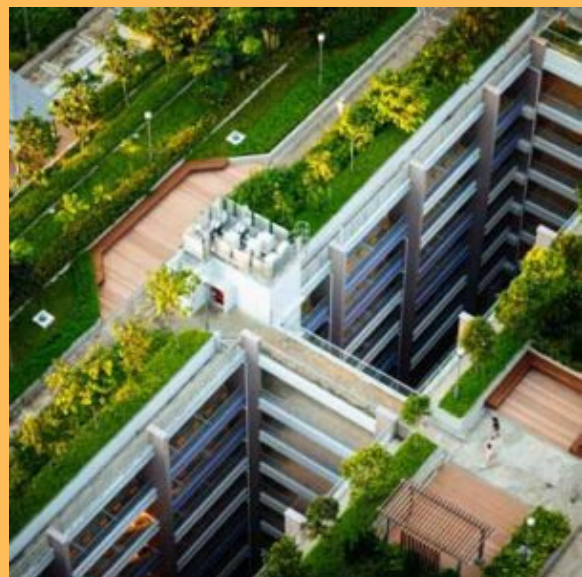
A building could be built with more eco-friendly natural materials instead of heavily processed or potentially toxic ones. Another option is to use higher quality materials to reduce the need for frequent repairs or replacements.

Construction teams can also recycle materials that have been saved from demolished buildings or scraped as unused components from other projects. Many metals are durable and can be reused or recast for new buildings, reducing the heavy impact of extracting more raw materials from the earth. Concrete and other materials can also be recycled.

Green buildings often turn to cleaner alternative energy options as a means to power (or partially power) their operations.

For most buildings, an easy way to do this is through solar panels. Many modern offices and homes have solar panels installed on their roofs. These panels can collect the sunlight exposed to the top of the building each day and help create electricity. Buildings with more surrounding property might have larger solar arrays set up on the ground adjacent to the buildings.

Even a few small solar panels can help to create greener energy and reduce the use of fossil fuels and their emissions.



Green Construction

Modern buildings have lights, HVAC units, running water and other amenities that require power and resources. For many of these, there are eco-friendly options that improve efficiency and reduce energy usage and costs compared to other options.

One example of this is windows. Thin windows that aren't well-sealed can cause excessive heat transfer, meaning that HVAC systems need to expend more energy to maintain temperature control. Installing high-quality double-paned windows with a strong seal can reduce the unwanted heat transfer and energy usage. Similar effects can be had by upgrading doors and insulation.

Other examples of environmentally friendly fixtures include:

- Energy efficient lightbulbs
- Automatic sensors for lights to turn off when a room is unused
- Toilets with variable flushing strengths
- Motion-sensor faucets in bathrooms and kitchens

As green construction becomes the standard in the industry, celebrating the progress and achievements on the path to sustainability can be a big part of continuing to drive those steps.

Awards, honors and unique certifications are all used to acknowledge accomplishments in green construction by contractors, industry leaders and the buildings themselves. The most well-known of these is LEED (Leadership in Energy and Environmental Design), a green rating and certification system administered by the U.S. Green Building Council. By reaching various eco-friendly benchmarks, projects can be awarded LEED Certified, Silver, Gold or Platinum status.

These certifications become a badge of honor for a building and the teams who built it. Companies are striving to reach the highest levels they can through pushing the boundaries and innovating in new ways.

Modular Buildings

Modular buildings are structures that are constructed in a factory setting before being transported for assembly on site.

Despite having been used as a method of construction for decades, this type of modular structure is increasingly being used for a wider range of construction projects, ranging from offices and hospitality builds to residential properties, and more.

Modular buildings are manufactured in sections away from construction sites before being delivered to the desired location where they are installed into a final building design. 60-90% of the work is completed in a factory-controlled environment, either as a complete structure or as modular subassemblies for a larger project.



Modular Buildings

This offsite construction allows the use of lean manufacturing techniques to create the prefabricated modules. These modular units can be placed end-to-end or stacked up to create different configurations. The modular construction process is completed onsite using inter-module connections (or inter-connections) to tie the units together.

Permanent modular buildings, such as prefabricated homes, are built to standards that are equal or higher than traditional site built properties, ensuring high levels of quality control.

Permanent modular construction (PMC) can be carried out with a variety of building materials, such as concrete, steel or wood, and can also include provision for adding windows, power supplies, water and sewage pipes, telecommunications, air conditioning and more. Many of these additional features can be installed before being taken to site, saving construction time later in the process. These PMC structures are designed to remain in one location once built and can include as many storeys as allowed by building regulations.

The design phase is particularly important in the creation of modular buildings. Design for Manufacture and Assembly (DfMA) practices need to be used to make sure the assembly tolerances are controlled and ensure any slack or misalignment can be taken up. CAD systems, additive manufacture (3D printing) and manufacturing control systems are important for modular construction since the components cannot easily be realigned onsite.

Modular Buildings

Types

Modular buildings generally fall under one of two types - permanent or temporary. Within these types, the actual buildings can range from 'flat-pack' solutions to façade systems and those where much of the construction is completed offsite before being delivered and put together.

The cost varies depending on scale of the project and the types of materials used. Other factors, such as the inclusion of internal fittings and fixtures, can also impact the cost of a modular building. However, case studies show they can offer significant savings when compared to traditional construction. This is due to factors such as weather not being a problem in delaying a project schedule and the ability to work on the structure offsite while the site is being prepared, reducing construction industry lead-times for completion.

How long a modular building lasts depends on whether it has been designed to be temporary or permanent. However, where many people still associate modular buildings with temporary structures, modern modular constructions can be built to last just like a traditional build.

PMCs have to meet building regulations that meet or exceed the same building standards required for traditional builds, and many are built using the same materials as regular buildings. While modular buildings undergo tests to ensure quality (and safety), they will still need maintenance just like any other construction to maintain them and extend their life.

With this all taken into account, modular buildings can last for decades and many prefabricated buildings built just after World War Two are still in use today.

Volumetric modular construction is where as much of the construction is completed offsite as possible. This could, for example, mean adding the fittings for a bathroom before the room is brought to site and tied into the rest of the structure.

Modular Buildings

Modular construction offers several advantages over traditional construction techniques. These include:

- Construction delays due to adverse weather and other onsite issues are not an issue with factory manufacture, eliminating many potential delays to project completion dates
- Factory conditions allow for a higher quality product with improved operating procedures and monitoring, while employees are able to work in a more comfortable environment. Construction can also more easily be extended 24/7 if required to complete a project
- Material supplies are easier to control in a factory setting, reducing wastage and thereby cost, as well as lowering the environmental impact of a build. The UK group WRAP, estimates that this can equate to up to a 90% reduction in material use as compared to traditional builds
- Manufacture of the modules can begin before onsite preparations, such as foundations, are complete, speeding up the whole build process
- Modular construction allows for different parts of the building to be built at the same time – further reducing the time taken to complete a project
- Modular construction is highly suited to remote locations where onsite building could prove difficult or expensive. Building away from these locations also means that staff can work in places where medical and sanitary provision is more readily available if required
- Modular structures can be added to over time or even be treated as a relocatable building which can also be readily refurbished to meet a new need
- Because modular units need to meet regulations for travel and assembly, the final product can end up being more durable than a traditional build that didn't have to be assessed part by part

Modular Buildings

There are a few challenges associated with modular builds, including:

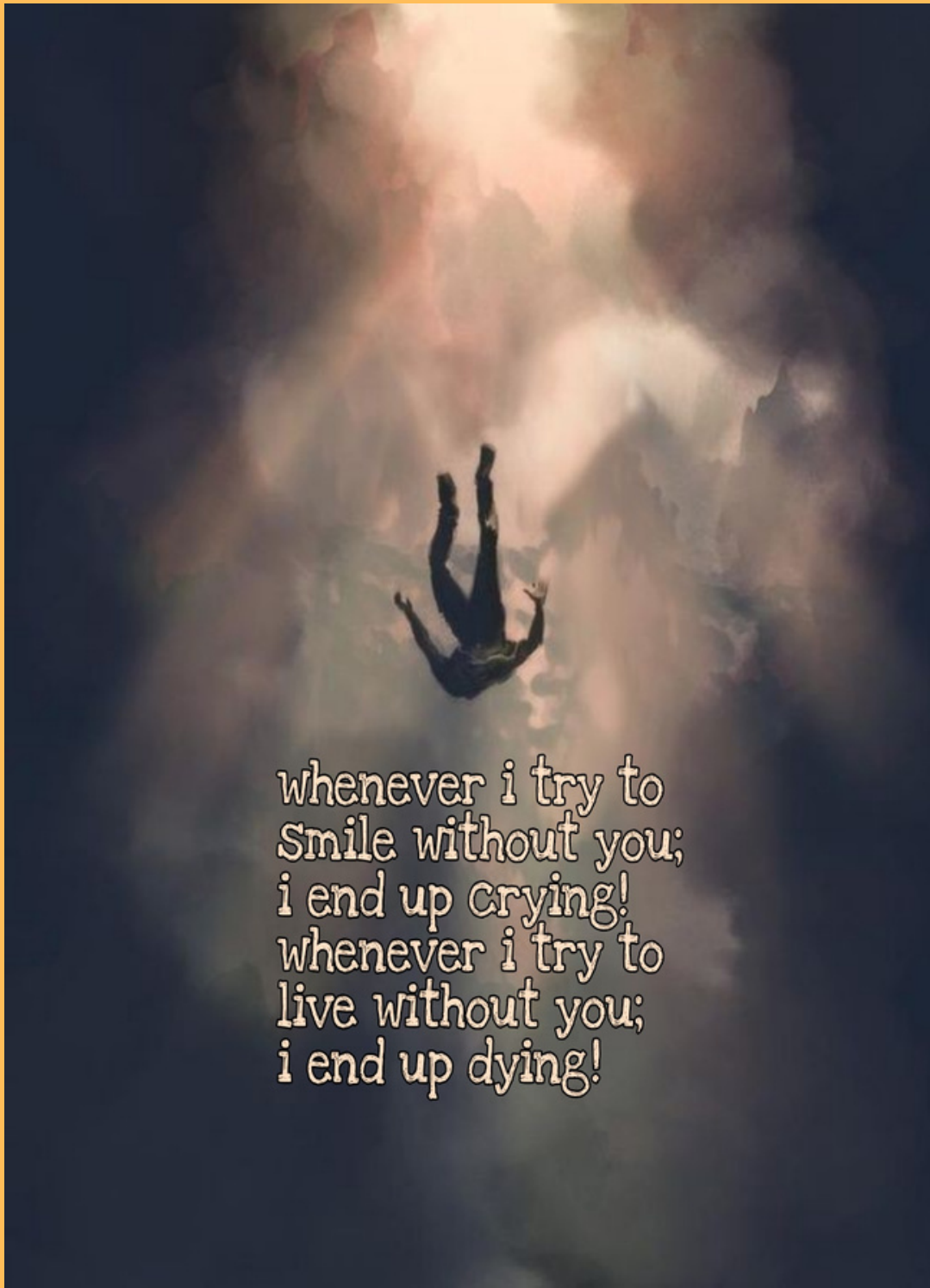
- The transportation of finished modular building sections can require a lot of space
- Manufacturing and transportation restrictions can limit the size of each modular unit, which can impact room sizes

Applications

- Where modular building used to be associated with temporary structures, improvements in quality, design and unit sizes mean that this type of construction continues to find new applications. From offices to homes and even larger builds like sports halls, the uses of modular construction are constantly growing.
- No longer associated with small, low cost structures, the modern wave of modular buildings are proving that they can be used for any number of applications while offering cost and time savings along with comparable levels of quality to traditional builds.



Glimpse of Student Talent



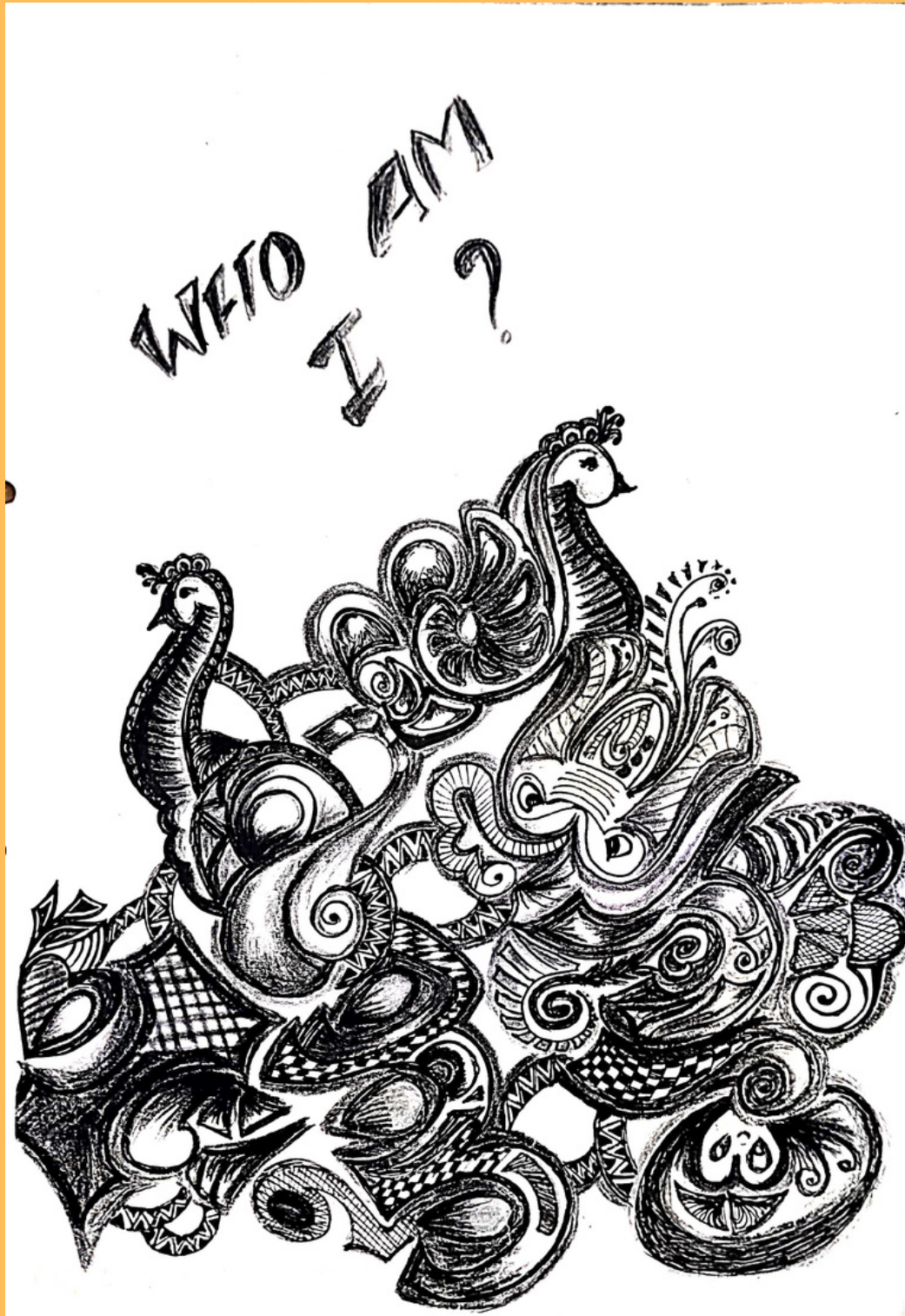
Done by
Divakar P , III Civil

Glimpse of Student Talent



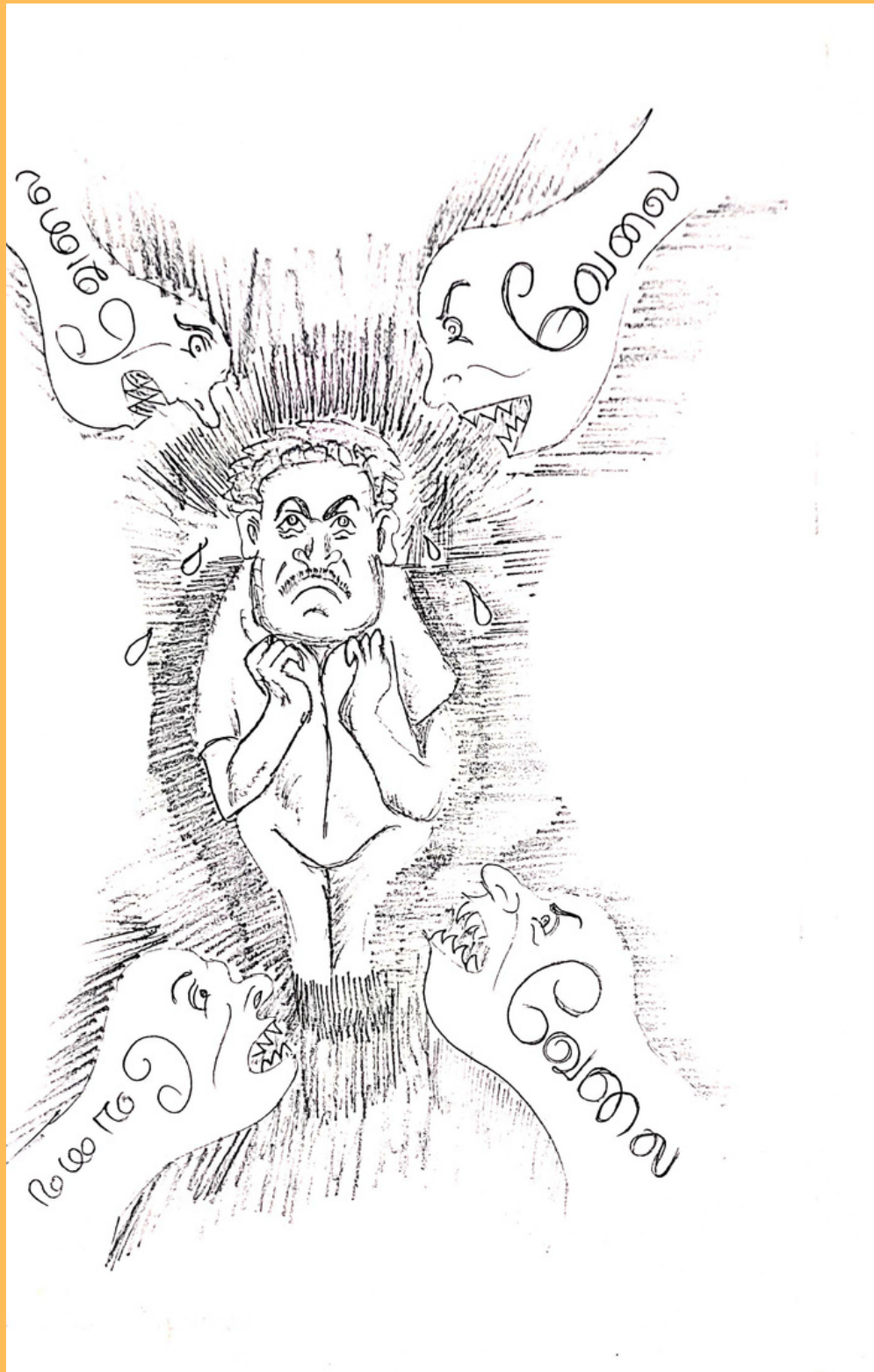
Drawing by
Hindhuja G , IV Civil

Glimpse of Student Talent



Drawing by
Fahumitha Afreen.R , IV Civil

Glimpse of Student Talent



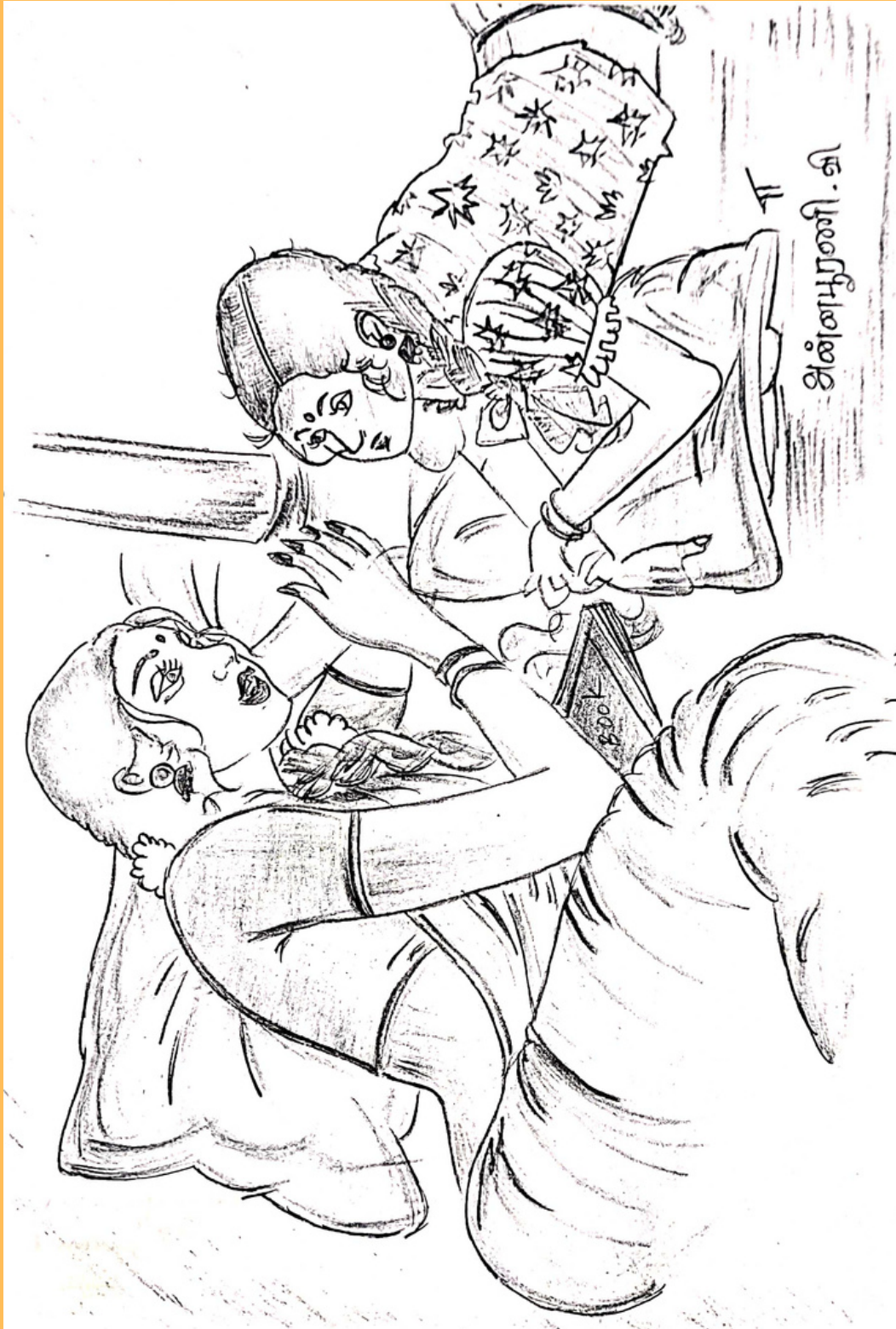
Drawing by
Annapurani V , IV Civil

Glimpse of Student Talent



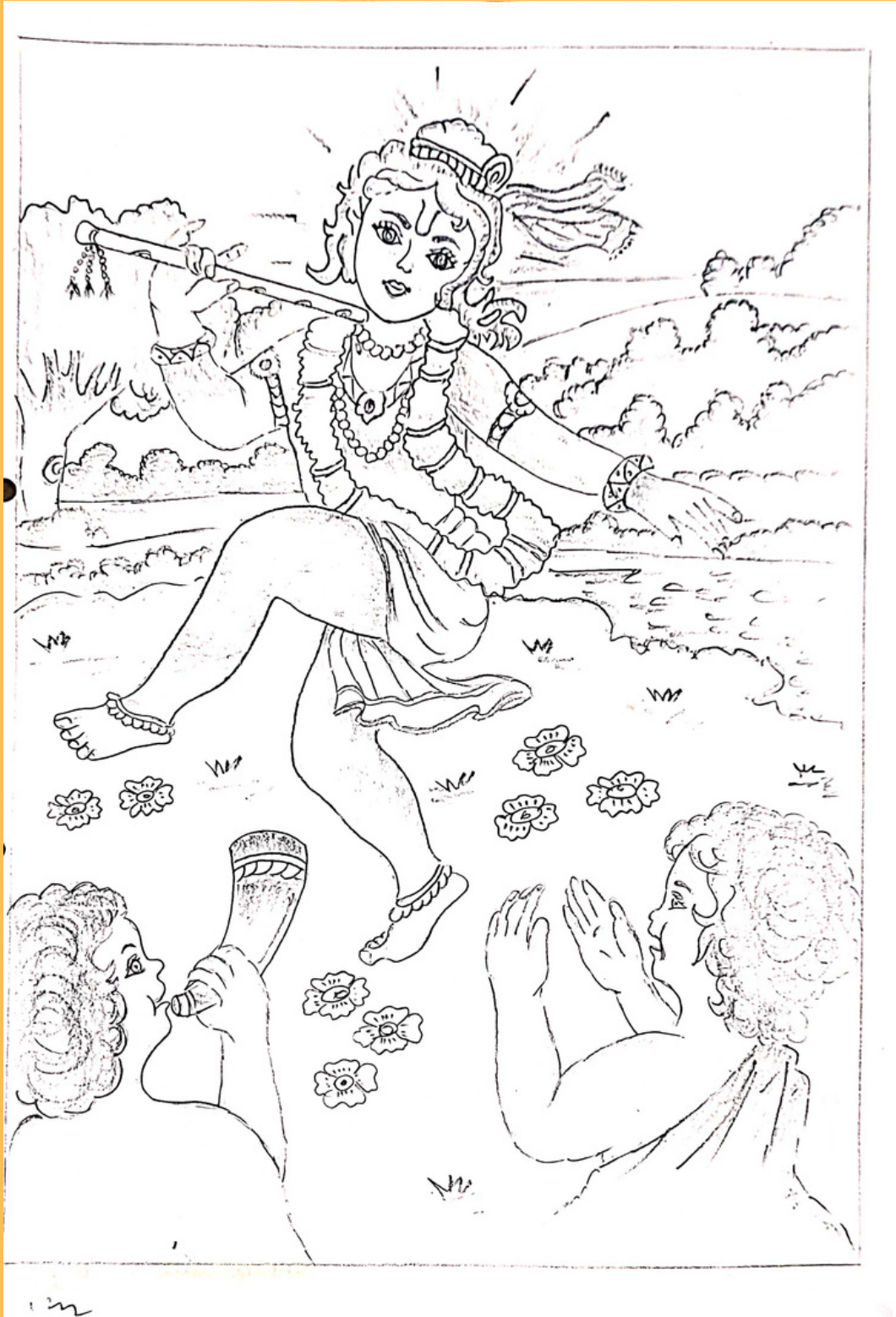
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Glimpse of Student Talent



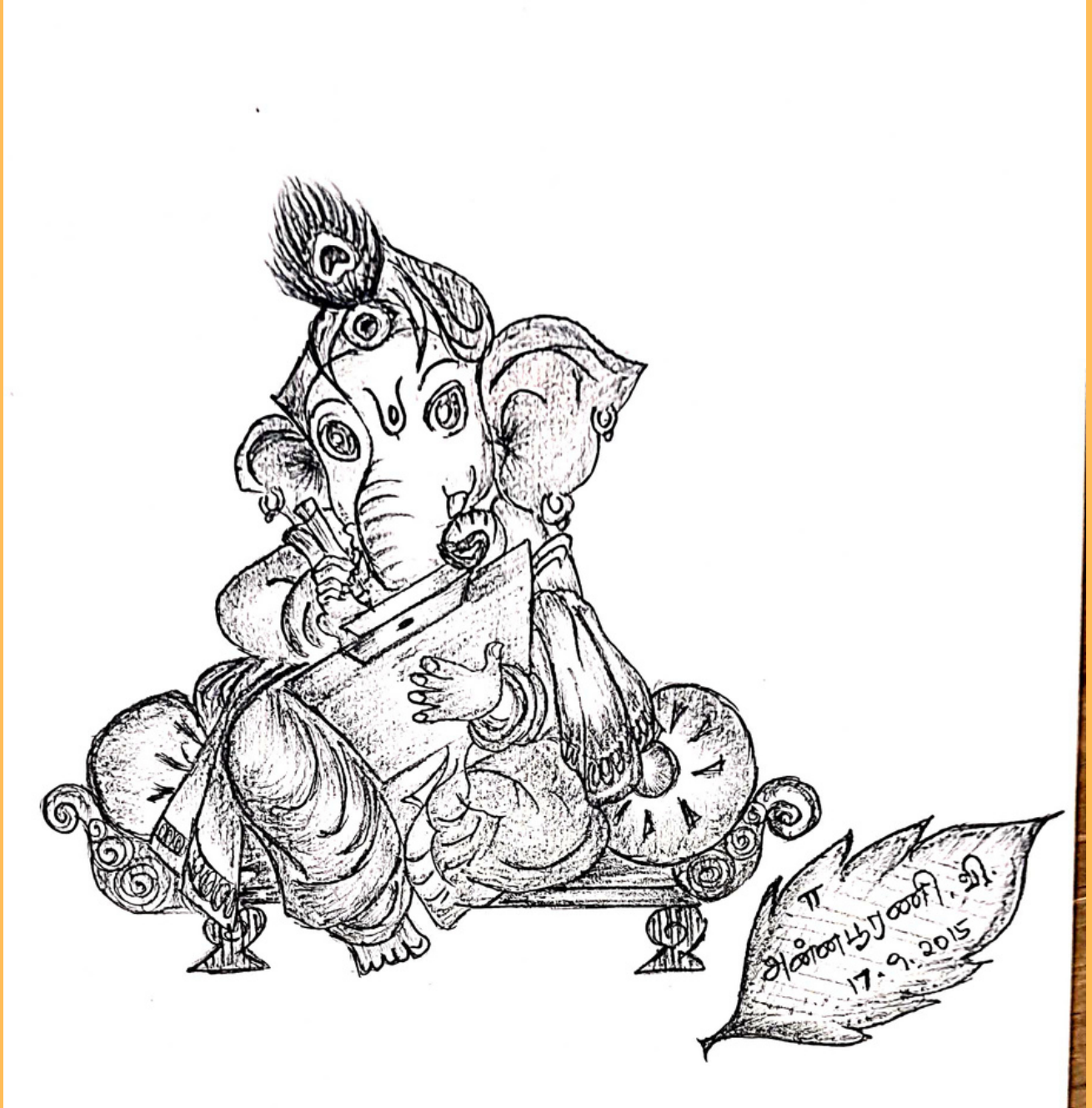
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Annapurani V , IV Civil

Glimpse of Student Talent



Drawing by
Annapurani V , IV Civil

Glimpse of Student Talent



Drawing by
Annapurani V , IV Civil

Glimpse of Student Talent

புதிய சகாப்தத்தின் ஆரம்பம்
நாங்கள்!

கிணி அணிவகுக்க இருக்கும் கட்டிடத்தின்
பிரம்மாண்கள் நாங்கள்!!

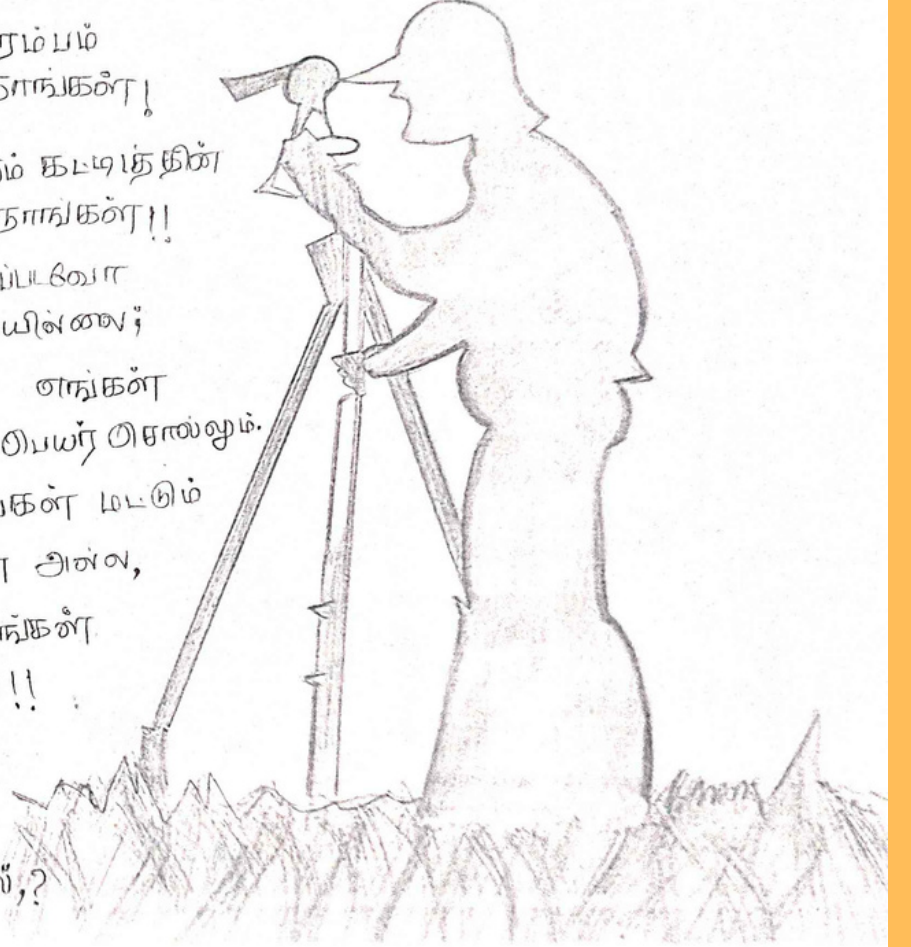
பதிவு செய்வோ, ஏதற்கும்படவோ
தேவையின்றி;

பிரம்மாண்ட உருவாய் நிற்கும் எங்கள்
கட்டிடங்களை எங்கள் பெயர் சொல்லும்.

காலத்தால் அழியாத கட்டிடங்கள் மட்டும்
எங்கள் குறிக்கோள் அல்ல,

கம்பீரக் கட்டிடங்களையும் எங்கள்
கடமைகள்!!

தூஜம்மறால் தூய் எங்கள்
என்னைதெரியு என
நீங்கள் நினைத்தால்,?



Glimpse of Student Talent

எட்டாவது அநித்யத்தை சந்திரகிரிவ சிவ்வா
கடவு முடிப்பாம்.!

அம்! கட்டுப்பாடுகள் ஏதும் இல்லை
எங்கள் கற்பனைக்கு;

தூசுகளும் சாந்தியமின்வை எங்கள் வெற்றிக்கு!!

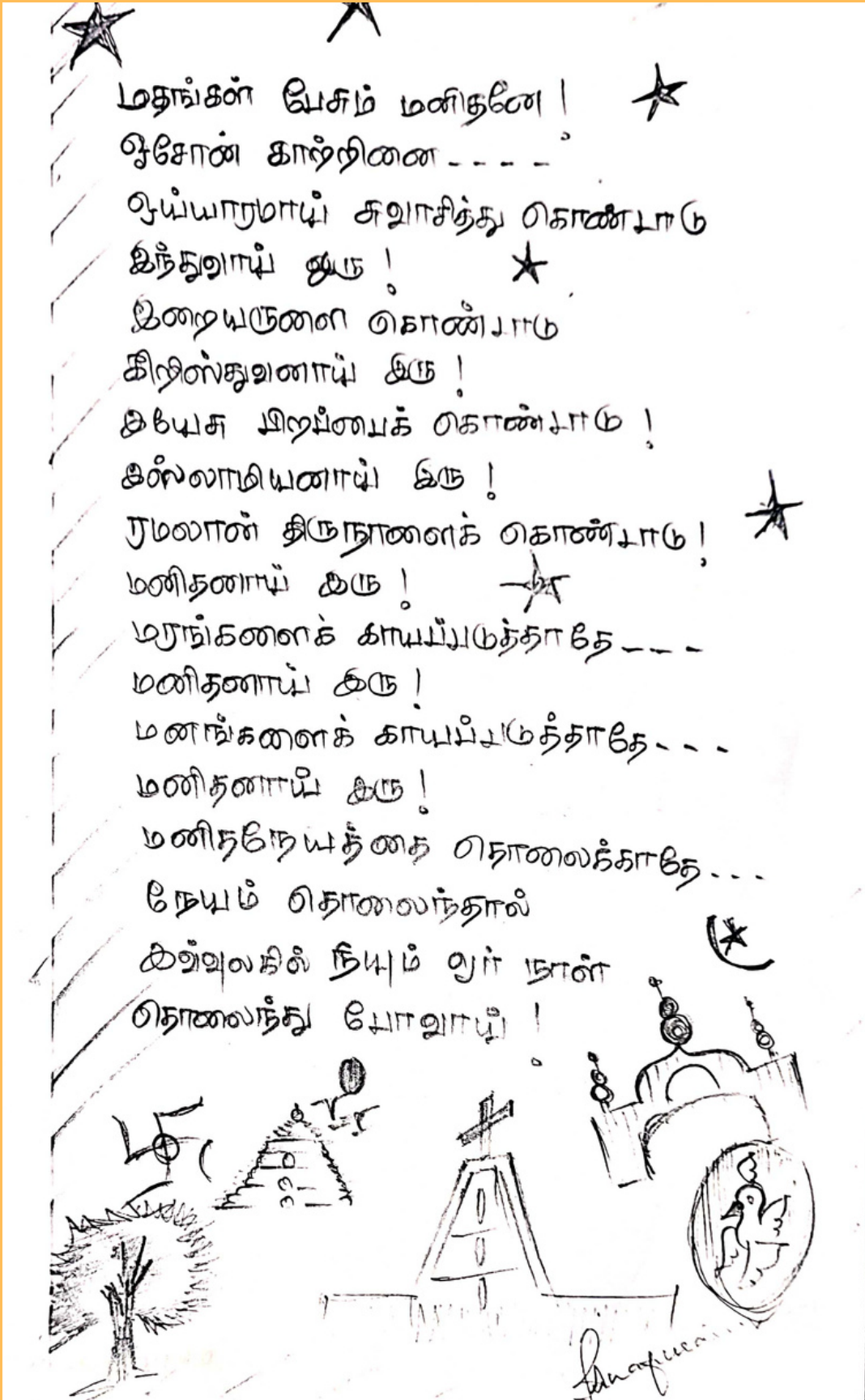
உலகம் நிலைநிறுத்தும் தூண்களில், என்மும்
எங்கள் அக சூங்கியை சூடுக்கும்;

சிதாராவோ என்னவோ,
என்மும் சிவால்வோம், தன்னம்பிக்கை கலந்த கர்வத்தோடு
யாம் கட்டிக்கலைந்துவன் என்மும்!!

G. Hinduja

Poetry by
Hinduja G ,IV Civil

Glimpse of Student Talent



Poetry by
Annapurani V ,
IV Civil

Glimpse of Student Talent

| ONE-SIDE LOVE

* கிளைமகன் கிரண்மையும் கிடுகிக் கொண்டு
கிளைமும் ண்ணும் ஷ்யுஸிஸில் குளிந்து கொண்டு....
கெரிமாத ககினைசைய புரிமாத மெய்யிமல்
மிடிக்கும் ராகத்தில் எடுகுகிளேண்
உன் கிளைம ஸ்ருயுஸிஸில் உமிர் சாணி கொடுக்கு
கிறந்துகுகி மெண்ணே கிஸ்தை ...

எண்ணை உறந்துகுகி கண்ணே.....

FRIENDSHIP

* உண்ணை மிரிந்து கெஸல்.....
உண்ணை உறந்து கெஸல்.....
உண்ணை மெறுக்கு கெஸல்.....
வூடு நான் உந்தான் சுக எண் உறணம்.....

* உண்மையாக தேசிமவர்களை

வூடு நிமிடம்

கண்களைமுடி

நினைக்கும் போது

மிரினைன் ஏக்கம்

அடியேறும்

உடியும் கண்ணிர் குளிகளில் கெரியும்



Glimpse of Student Talent

LIFE

- * தோல்விமயக் கண்டு தவர்ந்து போகக் கூடாது
ஏரிணலில் தவர்ந்து போகும் நேரத்தில்,
தோல்வி மீண்டும் யுதி "வெற்றிமய கண்டுகிடும்"



MOM:

- * எண்ணிக்கை கில்லாமல் தினமும் நான் மகிழ்ந்து
வாய்ந்த காலம் உன் அன்பில் வாய்ந்த நாட்கள்தான்... அம்மா
எண்ணி எண்ணி தினம் அடுதகும் உன்னை மரிந்த நாட்கள்தான்....
உன் அன்பை ரிசால்ஸ் 4து மொழி வேண்டும்...
உன் அன்பில் வாய் மீண்டும் யுதி ரிஜன்மம் வேண்டும்....

FRIEND

- * உண்ணவர்களில் மிகுக்கும் வானவில்லின் அயுதி வானவில்லுக்கி
தெரியாது....
எண்ணவர்கள் எதுவும் என் மனதிர்க்கிய் மரியாது....
கனவர்கள் காணும் கிதயத்திர்க்கி உண்கள் தெரியாது....
உண்கில் எண்ண தொலைத்தால் எண்ணவே தேடி அயுதிசென்
தினமும்...



Glimpse of Student Talent

♥ LOVE

* உந்தன் அன்மில் உறுகிய ரிந்நம் அன்மும்
உந்தன் அன்மை கிழந்து உடைகிறது
கிழமம் சொல்லத் துடிக்கிறது உன் காதுவை.....
அனாத் அனாத் சொல்லத் துடிக்கிறது உன் மனமே.....
அங்குதையால் பேசுவது அரிது கண்களால் பேசுவது பெரிது..
காதல் கந்த காயத்தின் வடிவு....
அடியில் வடியும் கண்ணீர்த் துளி....
கிழமம் கிடுந்தும் கிழக்கம் கிழமை உன்னை என்மும்
நான் ஸ்க்க்கில்லை



* கண் பார்த்து மயம் சிலிர்த்தேறன்.....
உன்னைப் பார்த்த உன் என்னை மறக்கிறேன்.....
உன்னை காணாதான் வாணில் மறக்கிறேன்.....
உனக்காக உயிர் கொடுக்கிறேன்.....
உனக்காகவே உயிர் வாழ்கிறேன்.....
உன்னை நினைத்தே உன்னை உரைக்கிறேன்....
உரைந்த மூடியத்தில் உயிரில் எதக்கிறேன்.....
உன்மையான அன்போடு...



Done by
Laxmi R ,
IV Civil

Glimpse of Student Talent

கண்ணில் நிழலாட

கருவிழி கணத்தாட

காத்திருந்த காலம் போதும் '

எண்ணம் உன் நினைவாக

இதயம் உன் வடிவாக

இருந்த என் நினைமை போதும்

போதும் போதும்

பொல்லாத உன் நினைவு - நெஞ்சம்தனில்

மோதும் மோதும்

ஏதும் தோன்றும்

என் உயர் உன்நினைவில்

ஏன் வாய் வேண்டும்

வேண்டும் வேண்டும்

வந்நாத கங்கைதண்ணை

கண்களுக்கே தந்தவண்ணை

Glimpse of Student Talent

விடிந்திடும் அருவியில் வெள்ளைநீர் தாமரை
வெண்தாமரைமணில் நின்றிடும் தேவதை
தேவதை கூறினால் சூர்தேவதைகள் மலர்நீந்திடும்
சோலைமீன் மலரிடை மயிலினம் உறக்கும்
புத்தலுக்கு இசையென உண்கமில் கூவிடும்
குயிலின் குரலினில் மாந்தர்கள் மயங்குவர்
மாந்தர்கள் மயங்கிடும் மாண்புறு இயந்திரங்கள்
இயந்திரங்கள் கண்டதும் தெள்ளியக் கவிதைகள்

அதிகாலை பேருந்துப் பயணம்
அடியிய சூத்துக்குங்கும் சாஸையின்
வழியெங்கும் பணிமுடும் ஆணால்
இயந்திர ரசிக்க மட்டும் மனம் போகவில்லை
நடத்துனர் தூவேண்டிய சூண்டிரை ரூபாய்
சில்லறையால் !!!

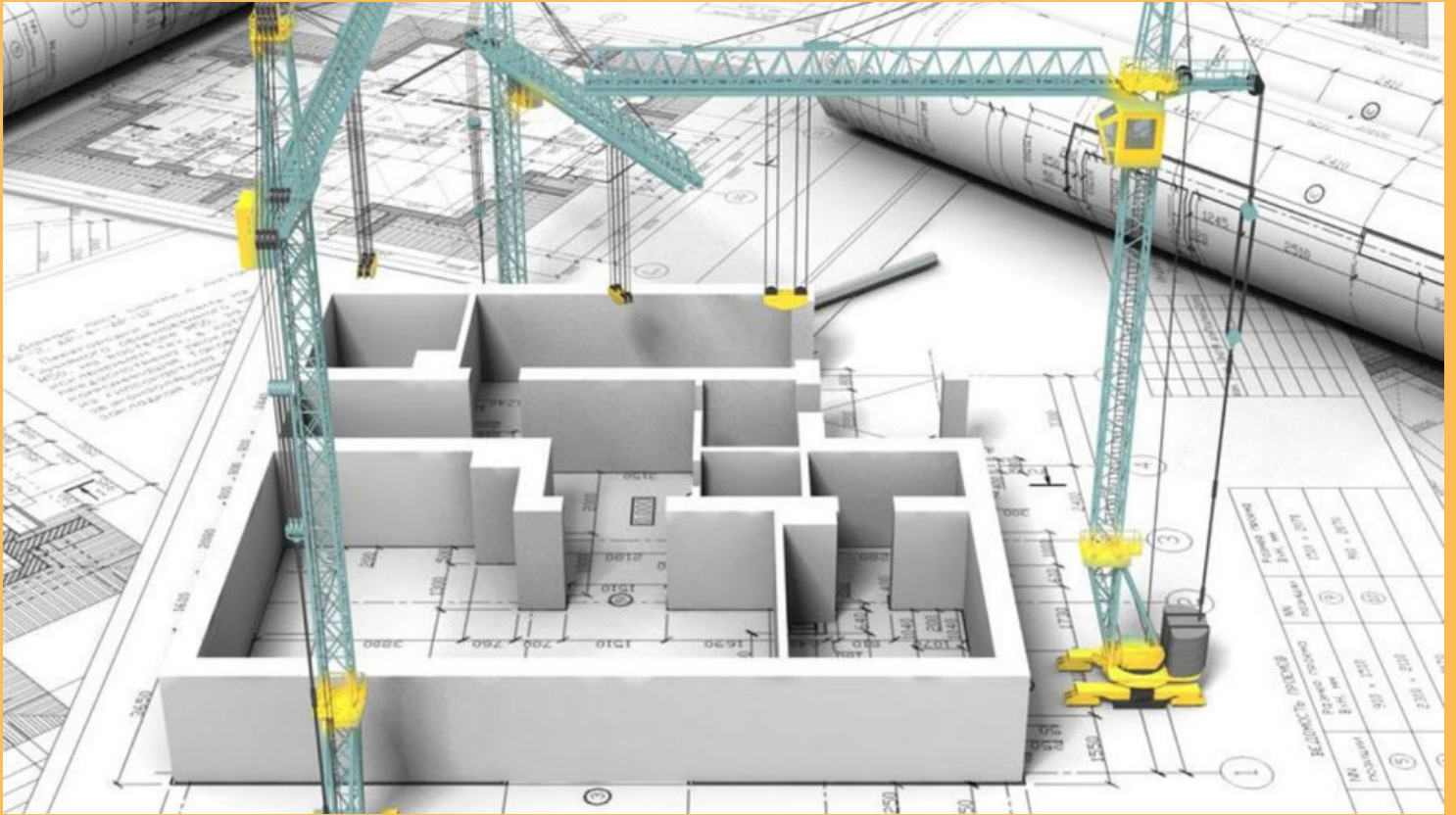
Glimpse of Student Talent

அது பேனாவில் தாம ஊர்நி
எழுதிய வாக்ஷியம் அல்லை
என் டிஸ்சிஸ் உன்னை ஊர்நி
எழுதிய காணியம்

மலரினாந்து வண்டி
தேனை மட்டும் எடுப்பது போல
உன்னிலாந்து நான்
நட்பை மட்டும் பெற்றுக் கொண்டேன்.

மேலை வீசும்படும் பொருள்
கீழே விசுவது
முறிநம்பு விசை
உன்னைக் கண்டது
வருகணம்
மேலை பறக்கிறேனே
அதுதான்
விழிநம்பு விசையோ?

Done by
Kaviya K , IV Civil



THANK YOU!!!