

Departmental Annual Report Departmental Activities: Curriculum and Beyond

Society: Rasayanika Year: 2023-2024

Staff Advisors: Dr. Nutan Rani and Dr. Sujata Sengupta

Office Bearers:

President	Vice President	General Secretary	Treasurer
Bhama M	Lisha	Hiteshi Gehlawat	Kirti Kaushal

Rasayanika, the Chemical Society, Miranda House, has had an active and enriching academic session during 2023-24. It was actively involved in **organizing** various **seminars and workshops** to create a holistic environment of learning beyond classrooms. Key activities also included arranging **Bridge Course**, Freshers' Welcome, Farewell party, lectures by various eminent speakers and Student Excursion.





ORIENTATION OF BATCH 2023-26

As the **new academic session officially began**, on **August 8, 2023**, the Department of Chemistry, Miranda House **warmly welcomed** the incoming batch of 2023-2026. The **orientation session** aimed to introduce the new students to the society and its activities. The session commenced with Dr. Sujata Sengupta (staff advisor *Rasayanika*), provided an overview of the department, the course structure and syllabus to the freshers. Following this, the council members introduced themselves and outlined the various events and activities planned for the academic year.

At the conclusion of the session, attendees were given refreshment coupons and enjoyed a brief tour of the campus. The core team guided the new students through the visually appealing facilities, including labs, classrooms, and libraries. The day ended with *Rasayanika* extending a warm welcome to all new students, wishing them success and a fulfilling journey at Miranda House.



ACTIVE LEARNING WORSHOP

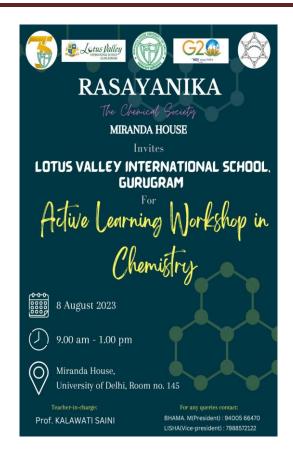
In an effort to promote creative teaching strategies and raise student interest in the latest topics of chemistry, the Department of Chemistry, Miranda House, organized an **Active Learning Workshop in Chemistry** on 8 August 2023. With an aim to share ideas and best practices in chemistry instruction, this session was especially created for the teachers and students of **Lotus Valley International School in Gurugram**. Prof. (Dr.) Smriti Sharma Bhatia and Dr Sujata



Sengupta from the department delivered lectures on key areas - Computational and Green Chemistry. A practical - hands on session was conducted - demonstrating various active learning techniques and best practices of the department. Teachers that use active learning tactics can help students develop a deeper understanding of the material and take an active role in their own education. We thank the students from Lotus Valley International School in Gurugram for their enthusiastic engagement and look forward to working together to further the field of chemistry teaching in the future.















INTERNATIONAL CONFERENCE ON SMART CONSUMPTION AND SUSTAINABLE LIVING - 2023

The Department and Rasayanika were proud to organize the International Conference on Smart Consumption and Sustainable Living (ICSCSL 2023) on the theme Approaches to Combat Environmental Pollution from 24 - 25 August 2023. The event saw seven sessions involving prominent scientists addressing the students and faculty.

DAY 1: The first day began with a warm welcome extended to the chief guest, **Prof. Sushma Yadav**, Pro Vice Chancellor at the Central University of Haryana. The NCC cadets escorted Prof. Yadav to the venue. She then inaugurated the event by lighting the ceremonial lamp. The proceedings commenced with her welcome address, and the Principal presented her with a token of remembrance.









The first lecture was delivered by PROF. CHANDER KUMAR SINGH, Head and Professor of Department of Natural and Applied Sciences TERI School of Advanced Studies, Delhi. Prof. Chander Kumar Singh delivered an insightful lecture on arsenic contamination in water bodies, with a focus on South Asian countries, particularly India. He detailed the severe toxicity of arsenic, illustrating its harmful effects on individuals who consume or use arsenic-polluted water. Prof. Singh discussed various sources of arsenic pollution, such as handpumps and crops irrigated with contaminated water. Through extensive research in India, he tested numerous handpumps and discovered that nearly all handpumps in North Indian states were contaminated with arsenic. He also highlighted the impact of political factors on the severity of the issue, noting that resource allocation in parts of Punjab was suboptimal. Prof. Singh recommended transitioning from handpumps to wells and mentioned efforts to assist local communities with alternative solutions, although some residents were reluctant to cooperate.

The second lecture of the day was delivered by **Prof. Dinesh Kumar**, Professor and Principal Scientist at Center for Environment Science and Climate Resilient Agriculture (CESCRA), Indian Agricultural Research Institute – IARI, Delhi, delivered a presentation on **biomass burning**, with a particular focus on rice residue burning. He outlined the various adverse effects of biomass burning, including increased pollution levels, deterioration of water quality, reduced crop yield and farm income, and negative impacts on human health.



Prof. Kumar described the practice of burning crop residues by farmers in Haryana and Punjab, which has led to significant ecological issues. This practice results in the emission of greenhouse gases such as nitrous oxide, methane, carbon dioxide, as well as aerosols and toxic gases. He explained that biomass burning negatively affects soil by altering its texture, composition, pH, and fertility, which in turn reduces productivity and disrupts the regulating ecosystem. He also highlighted that major global challenges include overpopulation and climate change.



The final lecture of the day was delivered by Dr. Shyamala Mani, Senior Advisor for WASH and Waste Management at the Public Health Foundation of India and the Centre for Environmental Health, addressed the pressing need to address human greed, which drives the relentless exploitation of natural resources without consideration for replenishment. She emphasized the importance of recognizing and controlling our consumption and production patterns to support the sustainability of circular economies. Dr. Mani discussed the physical and psycho-social impacts of climate change on the Indian subcontinent, highlighting its effects on agriculture, water resources, health, energy, transportation, tourism, and disaster management. She noted the increased vulnerability to climate extremes such as tropical cyclones, crop losses, and droughts. These conditions contribute to severe consequences, including heat stress-related deaths, urban flooding, heat and cold waves, and the spread of communicable diseases like malaria, dengue, and cholera. These issues result in substantial economic and social burdens on the country and its population.





DAY 2
SHRI VED PRAKASH MISHRA, Director CAQM & HSM division (MOEF&CC) was the guest of honor and delivered the welcome address.

DR. JITENDER KUMAR, CMO (Psychiatrist) & Nodal Officer (Bio- medical Waste Management), Hindu Rao Hospital Delhi, spoke on the chemistry of Biomedical wastes. He started his lecture by showing a video about biomedical waste management which was practiced during the COVID-19 pandemic in hospitals. He talked about the bio-medical waste management rules, the need for proper waste management, and **salient features of BMW Management Rules**, **2016**. He told us about punishment for noncompliance, like the occupier or an operator of a common bio-medical waste treatment facility shall be liable for all the damages caused to the environment, imprisonment for five years, or a fine of one lakh rupees. The lecture was greatly appreciated by the participants. The lecture was enlightening and knowledgeable. The presentation was so very good that he gained all the attention of the audience.





DR. ALOK MUKHERJEE, Scientific Secretary SASCOM and Centre on Global Change South Asi, highlighted the role that the average person may play in implementing sustainable practices into our daily lives and preventing the spread of calamity and dread among living things. He started his lecture with the hope of bringing about a better change in nature, above and beyond the exploitation done by mankind already. His lecture focused on the integrated data analysis and the qualitative junction between geographical, atmospheric, climatological, and physical studies to ensure that data and reforms are better collectivized into operating in a more efficient and quick manner. He brought to light the sickened conditions of hill stations due to insensitive tourism practices.



DR. PANKAJ KUMAR, Senior Policy Researcher Institute for Global Environmental Strategies (IGES), Japan, gave an invigorating talk about his research on the scientific feat achieved towards building and using AI models to predict water quality and water quantity in areas vulnerable to water availability and the other river basins of two rivers of Manila. He lectured about capacity building and training like software at affordable costs for developing countries has been undertaken him enthusiastically to ensure equitable research and development for a sustainable future. He while undertaking his research, also highlighted how he and his team identified factors that will affect water availability and the steps to be undertaken to assess the health impacts in flood situations and drought conditions. He is currently working as Senior policy researcher in the field of water resources and climate change adaptation.





The last and final lecture of the event was given by **PROF. KAUSHAL KUMAR SHARMA**, Dean, School of Social Sciences and Professor, Centre for Study of Regional Development Jawaharlal Nehru University (JNU). Prof. Sharma spoke about globalization, technology transfer, precision agriculture, and policymaking in terms of the environment and agricultural aspects. Citing examples of the vulnerability of places like Himachal Pradesh and Uttarakhand, he brought to light the dire ramifications of human encroachment into nature and the unfathomable wrath it is inflicting on the natural environment. He urged students to be conscious of the fact that 'nature tends to work according to its own goodwill and not according to how humans want it to act' and at the same time lectured about the need to make conscious and sensitive choices toward the nature by making manageable choices in our lifestyle.





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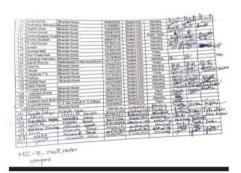


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PRIZE WINNERS:

ORAL PRESENTATION	Category – 1 UG/PG Students	
COMPETITION		
	Shinjinee Bhattacharyyaa	FIRST PRIZE
	Himanshi and Aastha Bhasin	SECOND PRIZE
	Kunali Gautam	THIRD PRIZE
	Category – 2 Research Scholars, Faculty Members and others	
	Gayatri J	FIRST PRIZE
	Ramya KR	SECOND PRIZE
	Anisha and Srinkanth Reddy	THIRD PRIZE
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	Category - 1 UG/PG Students	
	Jyostna Verma , Josiah Jose Kadithala	FIRST PRIZE
	Anshika Jaiswal	SECOND PRIZE
	Palak Sharma	THIRD PRIZE
	Malavika V and Vedanti Sunil Bhardwaj	CERTIFICATE OF APPRECIATION
	Chitra Shankar	CERTIFICATE OF APPRECIATION
	Category – 2 Research Scholars, Faculty Members and others	
	Sethupathi N , Ayan Sarkar	FIRST PRIZE
	Lokender Singh	SECOND PRIZE
		CERTIFICATE OF APPRECIATION





PLANTATION DRIVE

On August 31, 2023, the Department organized a **plantation drive** as an extension of the ICSCL initiative. Faculty, laboratory staff, and students took part enthusiastically, planting a diverse range of plants across the college grounds. This effort underscored the **group's commitment to sustainable development and environmental stewardship**. By planting trees and enhancing green spaces, we are actively working to create a healthier and more resilient planet for future generations. We extend our gratitude to all the teachers, students, and lab staff who contributed to the success of the plantation drive. Let us continue to work together to preserve our natural heritage and build a greener, more sustainable future.













TEACHER'S DAY

On September 5, 2024, Rasayanika celebrated Teachers' Day, to honor and express gratitude to the teachers of the Chemistry Department. The event was simple, heartfelt, and well-attended by the entire department. The celebration began with a cake-cutting ceremony led by our teacher-in-charge, Prof. (Dr) Kalawati Saini. Students from all three years joined in to sing "Happy Teacher's Day" in unison, creating a lively and joyous atmosphere in the classroom. The cake was later shared among the students, and many moments were captured in both hearts and photographs. The day was further enriched by students who brought flowers to express their appreciation, making the occasion even more special for the teachers.





PARLIAMENT VISIT

On September 21, 2023, 78 students from Miranda House, including students of the department, accompanied by coordinators Ms. Shruti Sharma Sethi, Ms. P Lishinai Paoteimai, and Dr Shivani Kumari, visited the new **Parliament House**. Upon arrival, the group was warmly welcomed by officials who provided an overview of the new Parliament building's facilities, including its graphical interface, smart displays, and infrastructure. The group was then permitted to view the ongoing parliamentary session from the visitor's gallery. During their visit, they observed debates on the **Women Reservation Bill, 2023**, and discussions on the **success of Chandrayaan 3**. The students had the exciting opportunity to see prominent political figures such as S. Jaishankar, Anurag Thakur, and Jaya Bachchan. The visit to the Sansad Bhawan, a key symbol of the nation's democracy, was both motivating and inspiring.





FRESHERS 2023

Fresher's party "Silsila Mulaqat ka" was organized by *Rasayanika* on 10 October 2023 to welcome the new students to the department. The fresher's got the chance to display their talent through an impressive ramp walk and performed with several impressive musical performances. The event was then enlightened by the teachers with the word of guidance and seniors with their amazing dance performances. Ms. Akansha Singh was declared as **Miss Fresher of the year**, Sristi Singh and Soumya Mall were 1st and 2nd runners up respectively. The special title of **Ms Theme** was given to '**Neha Choudhary**' who dressed up in Himanchal Ethnic. It was in all a very cheerful and memorable day.







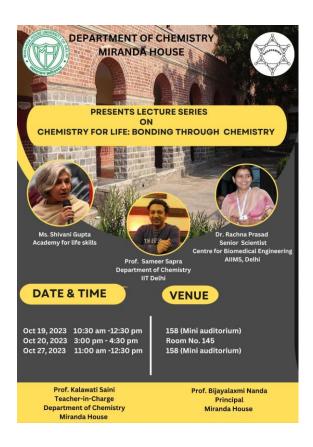






Lecture Series on "Chemistry for Life: Bonding Through Chemistry"

Rasayanika organized a lecture series titled "Chemistry for Life: Bonding Through Chemistry," held on October 19, 20, and 27, 2023. The first session on October 19, 2023, featured Ms. Shivani Gupta from the Academy for Life Skills. In her talk, Ms. Gupta explored the role of chemistry in everyday life and addressed various queries regarding career opportunities in the field. Her session was highly informative and well-received by the attendees. On October 20, 2023, the second session was led by Prof. Sameer Sapra from the Department of Chemistry at IIT Delhi. Prof. Sapra presented a simplified explanation of "Quantum Dots" and subsequently answered students' questions related to nanoscience, enhancing their understanding of this advanced topic. The final lecture of the series took place on October 27, 2023, with Dr. Rachna Prasad, Senior Scientist at the Centre for Biomedical Engineering, AIIMS, Delhi, as the speaker. Dr. Prasad delivered an enriching and insightful session, contributing significantly to the students' knowledge in the field. Overall, the lecture series provided valuable information and sparked engaging discussions on various aspects of chemistry, greatly benefiting the participants.











INTERACTIVE SESSION WITH PROF. MORTEN P MENDAL

It was an honor and pride for Miranda House to welcome Professor Morten P. Mendel, Nobel Laureate in Chemistry, 2022, and his wife Dr. Phaedria Marie St. Hilaire, a Life Sciences Business Leader and DEIB Advocate, for an interactive session with faculty and students on 1st February, 2024. Professor Morten P. Meldal is a Danish chemist and Professor at the University of Copenhagen and Head of the Center of Evolutionary Chemical Biology, UCPH, Denmark. He was awarded the 2022 Nobel Prize in Chemistry along with Prof. Barry Sharpless and Prof. Caroline Bertozzi for their groundbreaking development of 'click



chemistry and bioorthogonal chemistry'. Professor Meldal highlighted the importance of chemistry as a central science and its role in everyday life - from pharmaceuticals to agriculture and biomedical research. He further shared stories from his journey as a researcher and his experiences as a Noble Prize awardee. Much to the students' surprise and delight, Prof Meldal displayed his Noble Prize Medal to the audience. In simple words he explained the chemistry behind click chemistry, particularly highlighting its role in green and sustainable chemistry. When asked about the future direction of chemistry, Prof. Meldal felt click chemistry in the future years will revolutionize the pharmaceutical and polymer industry. His words were an inspiration to the young minds of Miranda House. Dr. St. Hilaire advocated the need for young women to pursue careers in STEM. She discussed the importance of women in leadership roles and breaking the barrier for betterment of the society. Students asked a variety of questions -ranging from the stereoselectivity of the click reactions to its applications in the pharmaceutical industry and the obstacles young women often face while pursuing careers in science. The event was truly a remarkable one which would remain in the memories of students for a long time.





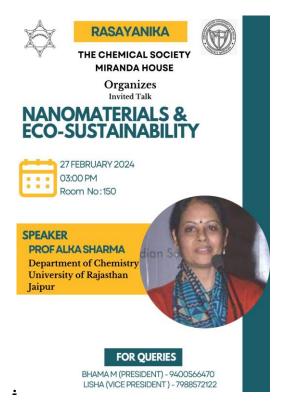




Invited Talk by Prof. Alka Sharma

On February 27, 2024, *Rasayanika*, had the honor of hosting **Prof. Alka Sharma** from the Department of Chemistry at the University of Rajasthan, Jaipur, for an interactive talk with students. The Department of Chemistry organized this informative session. Prof. Sharma commenced her talk with an overview of her educational background and career. She then delved into the topics of nanomaterials and eco-sustainability, presenting these complex concepts in an engaging and accessible manner. The session was both enlightening and thought-provoking, attended by approximately 40 students. Following her presentation, Prof. Sharma participated in a Q&A session, addressing all student inquiries with clarity and insight. She underscored the importance of having good mentors, teamwork, and maintaining consistency in one's efforts to achieve success. The event concluded with a token of appreciation presented by Prof. Kalawati Saini, acknowledging Prof. Sharma's valuable contribution to the session.













IUPAC-GWB 2024

IUPAC Global Women Breakfast is a global event celebrated to amplify the voices of women in the field of STEM. Although women continue to make significant progress in the field of science, strong efforts have to be taken to bridge the wide gap and disparity in their participation. As a women's institution, Miranda House continuously strives to promote young girls of the country to pursue careers in the science fields. For the past five years, the **Department of Chemistry has been actively participating in IUPAC** GWB - which is celebrated in conjunction with the United Nations International Day of Girls in **Science** and aims to promote women taking up careers in STEM. This year, the Department of Chemistry, Miranda House in collaboration with Indraprastha Vigyan Bharati organized a two-day International Lecture Series in celebration of IUPAC - Global Women's Breakfast (GWB) 2024 and National Science Day 2024 on 26 and 28 February 2024. The theme for IUPAC GWB 2024 was "Catalyzing Diversity in Science". A curtain raiser webinar was held on 26th February 2024 and Dr Phaedra Marie St. Hilarie, Life science business leader, DEIB Advocate and Angel investor addressed the audience with her lecture titled: Navigating Gender Diversity in Science. She highlighted the difficulties women often face while pursuing careers in science and the need for more women to overcome the challenges and take up careers in science. Both faculty and students found the session extremely enriching and thought provoking. In celebration of National Science Day, on 28th February 2024, the Department of Chemistry in collaboration with Vigyan Indraprastha Bharati, organized two seminars on the theme: Indigenous Technologies for Viksit Bharat. The two distinguished speakers for the day were **Dr. Rama Jayasunder**, Professor and Head of the Department of NMR, AIIMS and Dr. Munmun Ghosh, Assistant Professor, Department of Chemistry, Ashoka University. Dr Rama Jayasunder addressed the young audience with a talk titled: Ordinary Women, Extraordinary in Pre-Independent India. She highlighted the role played by Indian women in pursuit of knowledge in the sciences - their struggles and success. Dr Munmun Ghosh spoke about her research in the area of hydrogen fuel cells - a clean and flexible energy carrier. Both the sessions were enlightening and knowledgeable and well appreciated by faculty and students.



Miranda House UNIVERSITY OF DELHI



















PRATIKRIYA 2024

On March 19, 2024, the *Rasaynika* hosted its annual fest, "*Pratikriya*," showcasing the theme "**Shades of Green**," which **focused on sustainability and green chemistry**. The fest featured a series of engaging activities, including guest lectures, alumni interactions, and various student competitions.

The day began with an insightful **lecture by Ms. Somya Satsangi**, Independent Director at Dr. Lal PathLabs. With over 28 years of experience in technology, business consulting, and human resources, Ms. Satsangi delivered a compelling talk on the scope of chemistry in various disciplines and its impact on the business sector.

Following Ms. Satsangi's lecture, the "Rasayanika Rebonding" session featured successful alumni from the department. The alumni—Swati Jain, Ruchi Sharma Pandey, Akanksha Chauhan, Kanika Jain, Ekta Sangwan, and Priyanka Jain—shared their experiences and provided valuable insights into life at Miranda House, as well as opportunities available both during and after college.

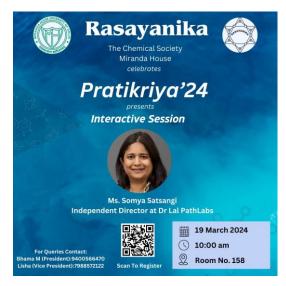
The afternoon was filled with a range of competitions for students from Miranda House and other institutions. These included:

- Eureka Paper Presentation Competition: Focused on the Nobel Prize 2023-winning discovery and applications of quantum dots. The presentations, judged by Dr. Vineeta and Ms. Priyanka Jain, showcased groundbreaking research in nanoscale semiconductor particles.
- **Prayog Lab Work Competition**: Tested students' practical skills and knowledge through handson lab activities and identification of equipment and glassware.
- **Sci-Quiz**: Covered topics related to carbon allotropes and quantum dots, featuring a preliminary round on carbon allotropes and a final round on quantum dots.
- Sci-Lens Photography Competition: Encouraged participants to capture scientific concepts
 through photography based on the theme "Science Around You." The judging panel, including Dr.
 Saloni Bahari and Dr. Somdutta Sinha Roy, evaluated the creativity and thematic relevance of the
 submitted images.

"Pratikriya" effectively highlighted the expansive influence of chemistry through its educational and interactive elements. The event not only provided a platform for intellectual exchange but also fostered creativity and engagement among participants. Special thanks are due to the department teachers, Rasayanika society members, Chem Academy, and all volunteers who contributed to the fest's success. Their efforts in organizing, coordinating, and executing various aspects of the event ensured a memorable and impactful experience for everyone involved.



















Competition	Placeholders	Positions
Eureka Paper Presentation Competition	Megha Roy and Shinjinee Bhattacharya	1 st place
	Kunali Gautum and Chitra Sharma	2 nd place



	Jaya Kumari and Himanshi	3 rd place
Prayog Lab work competition	Ankit Kumar Yadav	1 st place
	Ayushi Agrawal	2 nd place
	Karunya Nagda	3 rd place
Sci-Quiz	Tanuja and Aditi Sharma	1 st place
	Aastha Bhasin and Diksha Sharma	2 nd place
	Anshika Sharma and Shatakshi	3 rd place
Sci-Lens Photography Competition	Ujjwal Singh	1 st place
	Aakash Ghawri	2 nd place



Hands-On Training Workshop on Analytical Instrumentation Techniques

Rasayanika hosted a **One-day Hands-On Training Workshop on Analytical Instrumentation Techniques**.as the final event for the academic session 2023-24 and was held on April 23, 2024This workshop aimed to provide students with practical experience and insights into analytical instrumentation, focusing on essential tools such as spectrophotometers and chromatographs, and their applications in research and industry.

The event began with an inaugural ceremony featuring the lighting of the lamp and a welcome address by Prof. (Dr) Kalawati Saini. The chief guests, **Prof. S. Murugavel**, Director of USIC at the University of Delhi, and **Prof. Subho Mozumdar** from the Department of Chemistry, University of Delhi, delivered inspiring addresses, sharing their achievements, and encouraging future scientists.

The theoretical portion of the workshop commenced with a lecture by **Prof. Sunil K. Sharma** on UV-VIS Spectroscopy and Mass Spectrometry. Prof. Sharma introduced the basics of electronic transitions and demonstrated how fragmentation patterns in mass spectra can reveal compound structures. **Prof. P. Venkatesu** gave an in-depth lecture on Absorbance Spectroscopy and Fluorescence Spectroscopy, particularly in relation to biomolecules.

Resource persons Mr. Partha Sen and Mr. Vikrant Goel from Agilent Technologies India Pvt. Ltd. introduced their company's range of analytical instruments, including FTIR machines, UV spectrometers, and Liquid Chromatography tandem Mass Spectrometry (LC-MS) systems. They provided an overview of these instruments' functionalities and engaged the audience with interactive quizzes. In the practical session, participants were divided into two groups to explore the instruments firsthand. They operated the FTIR (Fourier Transform Infrared Spectroscopy) machine and the UV-VIS spectrometer, analyzing unknown samples and interpreting the resulting data. This hands-on experience allowed participants to apply their theoretical knowledge and gain practical skills.

The workshop concluded with participants gaining valuable insights into analytical instrumentation techniques. The success of the event was due to the dedication of the faculty, guest speakers, volunteers, and the active participation of attendees. The Department looks forward to such enhanced collaborations with industry partners to further enrich learning experiences, fostering innovation and skill development.



















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