CORONA

THE ANNUAL COLLEGE MAGAZINE, 2026

Estd. 1998

24TH EDITION

COLLEGE OF ENGINEERING AND MANAGEMENT, KOLAGHAT

(An Institute under VSIL Society of Department of Power, Government of West Bengal)

ANNUAL SPORTS MEET

CORONA

'THE CHRONICLES OF OUR JOURNEY'

THE ANNUAL COLLEGE MAGAZINE

24th Issue, 2026

Estd. 1998

Under Vidyasagar Society for Integrated Learning (VSIL)

A society established and run by

The Department of Power, Government of West Bengal and the WBPDCL

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Vision Statement of the College

Pursuing Excellence in Teaching Learning Process to Produce High Quality Engineering Professionals.

Mission Statement of the College

To enhance the employability of our students by imparting high quality technical and professional education with continuous improvement in monitoring of students' performance as per the expectation of various stakeholders.

To continuously upgrade, as well as broaden the knowledge base, along with promoting a culture of research for achieving excellence.

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সত্যমেব জয়তে

গার্গী দাস ঘোষ
রাষ্ট্রমন্ত্রী
বিদ্যুৎ দপ্তর এবং
অচিরাচরিত ও পুনর্নবীকরণযোগ্য শক্তি উৎস দপ্তর
পশ্চিমবঙ্গ সরকার

11th August 2026

Message

I am glad to know that the College of Engineering and Management, Kolaghat will publish the 24th issue of its college magazine, CORONA, on occasion of the 29th Foundation Day of the college.

The publication of a college magazine showcases the intellectual range and creativity of its various members and provides them the creative space to think beyond mere textbooks.

By pursuing excellence in teaching and learning process, I am sure that the faculty and staff members will continue to ensure a conducive environment for nurturing young minds, which will ultimately contribute to our nation's development.

I am hopeful that the education imparted to students will turn them into a productive workforce whichwill lead toachieving the national vision of transforming India into a Viksit Bharat—a fully developed, self-reliant and globally leading nation.

I congratulate everyone associated with the publication of this magazine. To the students, I wish you immense success in your academic and professional journeys. May you continue to innovate, excel, and make our state and nation proud.

To conclude, I would like to quote Dr. A.P.J. Abdul Kalam - "Dream, dream, dream. Dreams transform into thoughts, and thoughts result in action".

(Gargi Das Ghosh)

Prof.Dr.Dilip Kumar Gayen
Director
College of Engineering & Management,Kolaghat

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No. 81 Pr.S (P)/2026

12th August,2026

Message for the College Magazine CORONA (24th Issue)

I am glad that the College of Engineering and Management, Kolaghat is going to publish its 24th issue, CORONA, on the occasion of the 29th Foundation Day of the college.

At the outset, I want to express my deepest admiration for the faculty members and all other members associated with this college ; you all are the key figures behind every milestone of this worthy institution and it is only through your hard work and perseverance that this institution has earned its repute.

Your relentless efforts and untiring dedication have shaped many careers and I wish the students the very best and wish that they bring back to the College much more than they have received,as glorious alumni.

I am sure in the coming days the reputation of the college will be upheld and expand manifold as it marches towards greater glory.

12/8/26

Santanu Basu, IAS

Dr. P. B. Salim, IAS
Chairman & Managing Director

WBPDCL

Message

"Education: The foundation of progress"

It is with immense pride and joy that we celebrate the 29th Foundation Day of College of Engineering and Management, Kolaghat. Over nearly three decades, this institution has stood as a beacon of knowledge, nurturing generations of students and shaping them into responsible citizens and accomplished professionals.

This day is not only a commemoration of the college's journey but also a tribute to the visionaries, faculty, staff, and students who have contributed to its growth. Each milestone achieved reflects the dedication, perseverance, and collective spirit that define our community.

As we step into the future, let us reaffirm our commitment to academic excellence, innovation, and holistic development. May this Foundation Day inspire us to uphold the values of integrity, inclusivity, and lifelong learning, ensuring that our college continues to shine brightly in the years ahead.

Wishing everyone a memorable 29th Foundation Day filled with gratitude, pride, and hope for greater achievements. Let the 24th issue of CORONA which you are bringing out on this occasion become a source of inspiration and a reference book for generations to come. May the coming years bring greater achievements, deeper bonds, and brighter horizons for the college community.

23/07/26
(P. B. Salim)

Prof. Dr. Dilip Kumar Gayen
Director
College of Engineering & Management, Kolaghat,
West Bengal.

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From the Desk of Director

8th August, 2026

MESSAGE

"The beautiful thing about learning is that no one can take it away from you." — B. B. King

On the occasion of the 29th Foundation Day of the College of Engineering & Management, Kolaghat, I extend my heartfelt greetings to all members of the CEMK family. Since its establishment in 1998 under the visionary leadership of Dr. Sankar Sen, the institution has steadily grown into a center of academic excellence. During its early years, we were privileged to be guided by legendary teachers such as Prof. J. K. Das, Prof. B. Pal, Prof. J. K. Sen, Prof. C. R. Mahata, Prof. S. N. Bhadra, Prof. K. K. Ghosh, Prof. C. K. Roy, and Prof. N. C. Maity, whose invaluable contributions laid a strong academic foundation for the institution.

Today, our faculty, staff, and students continue to carry forward this legacy with dedication and innovation. Our alumni, through their achievements and contributions across diverse fields, continue to strengthen the reputation and legacy of the institution. The 24th edition of CORONA reflects the creativity and expression of our students, highlighting the vibrant academic and cultural spirit of CEMK.

Let us continue to strive for higher goals with commitment and unity.

08.08.2026

Prof. Dr. Dilip Kumar Gayen
Director

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MESSAGE

I take this opportunity to extend my heartfelt gratitude to all the associates responsible for publishing the **24th issue** of magazine **'CORONA'** on the occasion of celebrating the **29th Foundation Day** of the College of Engineering & Management, Kolaghat, under the auspices of Vidyasagar Society for Integrated Learning (VSIL) on 23rd September, 2026.

I hope the publication of this magazine will serve as a source of inspiration among students and other writers, and also provide them with an opportunity to share their innovative thoughts and showcase their creative talents.

I convey my best wishes to all for its grand success.

20/8/26
(Dhruba Dasgupta)
Executive Director (HR&A)

Prof. Dr. Dilip Kumar Gayen,
Director,
College of Engineering & Management, Kolaghat,
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Memo. No. KTPP/GM/ 2579 Date : 03/09/2026

MESSAGE

I am delighted to extend my warm greetings to the students, faculty and staff of College of Engineering & Management, Kolaghat (CEMK) on the auspicious occasion of the 29th Foundation Day and the publication of the 24th issue of "CORONA".

May CEMK continue to inspire young minds through knowledge, innovation and excellence, and achieve greater heights in the years ahead.

On behalf of KTPS, I convey my best wishes for the grand success of the celebration and the magazine.

03/09/26

(Debes Kumar Deb)
General Manager
KTPS :: WBPDCL

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Message from the Convener
CORONA 2026

Over the years, the College of Engineering and Management, Kolaghat has continuously strived for excellence in academics as well as in co-curricular and extracurricular activities. We firmly believe that participation in such activities plays a vital role in the holistic development of students, nurturing creativity, leadership, teamwork and ethical values, thereby shaping them into competent professionals and responsible human beings.

It gives me immense pleasure to present the 24th edition of the techno-cultural college magazine, *CORONA 2026*, on the occasion of the College Foundation Day celebrations. This magazine serves as a vibrant platform to showcase the creativity, talent, and innovative spirit of our students, faculty members and staff. It reflects the diverse achievements, ideas, literary expressions, artistic pursuits and memorable moments that define the vibrant culture of our institution.

I extend my heartfelt gratitude to all the students, members of the Editorial Board, the Magazine Committee, faculty members, staff, alumni and all our stakeholders whose enthusiastic support, valuable contributions and dedicated efforts have made the publication of this magazine possible. I also express my sincere appreciation to the members of the Advisory Committee for their invaluable guidance and constant encouragement throughout the publication process.

I would like to take this opportunity to encourage our students to participate wholeheartedly in future editions of *CORONA*. Your ideas, creativity, and contributions are the true essence of this magazine and your active involvement will continue to enrich this platform for years to come.

On behalf of the Magazine Committee, I wish everyone a very happy, healthy, peaceful, and prosperous festive season.

19/8/26

Asst. Prof. Soumi Ganguly
Convener, CORONA 2026
College of Engineering and Management, Kolaghat

Dr. Deb Kumar Adak
(HOD, Mechanical Engineering)

DEPARTMENTAL RESEARCH PUBLICATIONS

Computer Science and Engineering

Details of Journal Publications

1. Siddhartha Chatterjee, Anwesha Mukherjee and Sudipta Hazra, " A Comprehensive Review of Cybersecurity Attack Vectors and Mitigation Strategies ", International Journal of Engineering and Information Management (IJEIM), vol. 2, Issue. 2, pp. 33-52, ISSN - 3107-5886, DOI - 10.52756/ijeim.2026.v02.i02.003, International Academic Publishing (IAPH), Publons, zbMATH Indexed, April 15, 2026.
2. P. Mishra, "Artificial Intelligence of Things: Leading the Future for Ubiquitous Connectivity and Automation Techniques," in Proceedings of the International Conference on Progressive Trends in Engineering, Management & Science (PTEMS-2026), 2026.
3. P Mishra, "The Rise of Decentralized Autonomous Organizations: Innovating Governance Approaches with Blockchain," JMCMS Journal, 2026.
4. Poushali Das, Subhajit Ojha, Abhinaba Bhattacharyya, Ritwika Ghosh, Anindita Naha, Raima Bhattacharyya, Trishna Chakraborty, Arpita Chakraborty, Chandra Karmakar, Siddhartha Chatterjee, "Bhabanipur Assembly Election Digital Twin: A GEO-Spatial Multimodal Artificial Intelligence Structure", International Journal of Creative and Open Research in Engineering and Management, EDTECH PUBLISHER, ISSN No: 3108-1754
5. Nayan Adhikari, Pallabi Ghosh, Abhinaba Bhattacharyya, Siddhartha Chatterjee, "AQIP: Air Quality Index Prediction Using Supervised ML Classifiers", International Journal of Innovative Science and Research Technology, Volume 10, Issue 7, July – 2025, Page No. 835 to 842, ISSN No:-2456-2165
6. Kaushik Sinha, Debalina Sinha Jana, "Detection of Synthetic or Cloned Voices using Deep Learning and Acoustic Feature Analysis", International Journal of Computer Applications, 187, 17 pp 47-52, Jul 2025. doi: 10.5120/ijca2025925228
7. K. Sinha and Debalina Sinha Jana, "An Intelligent Flood Monitoring Framework Using Deep Convolutional Neural Networks", JONSCN, vol. 11, no. 2, pp. 20–28, Aug 2025.
8. Kaushik Sinha, Debalina Sinha Jana, "Adversarially Robust Mask Generator: A Secure Encoder Network for Deep Learning-Based Steganography", International Journal of Technology & Emerging Research (IJTER), 2(4), pp 78-87, Apr 2026. doi: 10.64823/ijter.2604009
9. Kaushik Sinha, Debalina Sinha Jana, "Rarity-Aware Spatiotemporal Attention Mechanisms for Extreme Rainfall Prediction in the Indian Subcontinent", IJVRA - International Journal of Versatile Research and Analysis (www.IJVRA.org), ISSN:2984-8903, Vol.4, Issue 4, page no.144-156, April-2026, doi: 10.56975/ijvra.v4i4.704262
10. T. Chattopadhyay and D. K. Gayen, "Binary increment operation using CRSOA-MZI switches", Optics Communications, Elsevier, 584, 131800, July (2025)
11. D. K. Gayen and T. Chattopadhyay, "All-optical data authentication using carrier reservoir semiconductor optical amplifiers assisted Mach–Zehnder interferometers",Optical and Quantum Electronics, Springer, 57, 641, November (2025)

12. Lipika Datta, Sudip Ghosh, Siddhartha Chakraborty, Siddhartha Sahu, Subham Nandi, "Deadline Constrained Modified Min-Min algorithm for Cloudlet Scheduling", Research Digest on Engineering Management and Social Innovations(p-ISSN: 3117-4418 e-ISSN: 3117-4426), Volume: 02 Issue: 05, May, 2026, pp: 345 – 353
13. S. Das and U. K. Mondal, "Blockchain-implied Architecture for Secure and Energy Efficient Processing of IoT Data in Pervasive WSNs", JTIT, vol. 102, no. 4, pp. 50–60, Dec. 2025, doi: 10.26636/jtit.2025.4.2194.
14. Roy, B.B., Debnath, A., Das, S. et al. Advanced lossless audio codec utilizing adaptive clustering and delta addition techniques. Int. j. inf. tecnol. 18, 55–62 (2026). doi: 10.1007/s41870-025-02781-w
15. B. B. . Roy, S. Das, and U. K. Mondal, "TinyML-driven Sensor Nodes for Energy-efficient Acoustic Event Detection in Pervasive Acoustic WSNs", JTIT, vol. 100, no. 2, pp. 69–77, Jul. 2025, doi: 10.26636/jtit.2025.2.2084.

Details of Conference Publications:

1. Siddhartha Chatterjee, Debasish Acharya, Rambilas Ganguly, Bikash Debnath, Sudipta Hazra and Abhinaba Bhattacharyya, "Class Topper Optimization Algorithm based Optimal Cryptographic Technique" In 2025 International Conference on Computing, Intelligence and Applications (CIACON), IEEE Xplore Digital Library, SCOPUS Indexed, pp. 1-6, DOI - 10.1109/CIACON65473.2025.111.89470, ISBN - 979-8-3315-4411_9, October 10, 2025.
2. Siddhartha Chatterjee, Arijit Khanra, Mayank Kumar and Ankita Mandal, "Efficient NetB0 vs. VGG16 vs. ResNet-50: Classification of Various Skin Diseases Using Deep Learning" In 2025 International Conference on Next Generation of Green Information and Emerging Technologies (GIET), IEEE Xplore Digital Library, SCOPUS Indexed, pp. 1-5, DOI - 10.1109/GIET65294.2025.11234761, ISBN - 978-1-6654-5806_1, November 17, 2025.
3. Siddhartha Chatterjee, Sima Das, Samik Acharya, Ritwika Ghosh and Anwesa Naskar, "Early Diagnosis: Alzheimer's and Parkinson's Disease Detection Using Machine Learning Techniques", Lecture Notes in Networks and Systems (LNNS), Springer Singapore, SCOPUS Indexed. Proceedings of International Conference on Data Analytics and Insights (ICDAI 2024), vol. 1233, pp. 189-197, DOI - https://doi.org/10.1007, ISBN - 979-8-3503-9266_1, July 15, 2025.
4. Siddhartha Chatterjee, Sutirtha Guha, Somasree Bhadra, Sudipta Hazra and Abhinaba Bhattacharyya, "Classical Optimization Problem Solution Using Nature Inspired Algorithm", In 2025 International Conference on Recent Advances in Electrical, Electronics, Ubiquitous Communication and Computational Intelligence (RAEEUCCI), IEEE Xplore Digital Library, SCOPUS Indexed, pp. 1-5, DOI - 10.1109/RAEEUCCI63961.2025.11048319, ISBN - 979-8-4503-9266_1, July 4, 2025.

5. Siddhartha Chatterjee, Nayan Adhikari, Sayan Duari, Debdut Parali and Soumyadeep Maity, "Evaluating Context-Aware Scoring and Supervised Classification Methods for Toxicity Detection in Social Media Comments", In 2026 IEEE International Conference on Recent Advances in Electrical, Electronics, Ubiquitous Communication and Computational Intelligence (RAEEUCCI), IEEE Xplore Digital Library, SCOPUS Indexed, pp. 1-7, DOI - 10.1109/RAEEUCCI67649.2026.11504747, ISBN - 979-8-3195-4165_9, May 9, 2026.
6. Siddhartha Chatterjee, Nitu Saha, Sayantani Das, Ujjwal Kamila, Arista Seth and Arunima Banerjee, "Comparative and Generative Analysis of Monte-Carlo, EWMA and LSTM Models for Financial Value-at-Risk Forecasting", In 2026 IEEE International Conference on Emerging Trends in Advancements and Applications of Computational Intelligence Techniques (ETAACT 2026), IEEE Xplore Digital Library, SCOPUS Indexed, pp. 1-6, DOI - 10.1109/ETAACT69135.2026.11542023, ISBN - 979-8-3315-4949-7, June 4, 2026.
7. Siddhartha Chatterjee, Rupa Debnath, Atanu Sen and Saikat Samanta, "A Prediction Model for Cardiovascular Disease Powered By Machine Learning", In 2026 IEEE International Conference on Emerging Trends in Advancements and Applications of Computational Intelligence Techniques (ETAACT 2026), IEEE Xplore Digital Library, SCOPUS Indexed, pp. 1-6, DOI - 10.1109/ETAACT69135.2026.11542090, ISBN - 979-8-3315-4949-7, June 4, 2026.
8. Siddhartha Chatterjee, Sudipta Hazra, Rituparna Mondal and Anwesa Naskar, "Analysis and Comparison of Cardiovascular Risk Prediction Using Machine Learning Approaches" In the Proceedings of International Conference on Advanced Computing and Systems (AdComSys 2024), zbMATH & Web of Science Indexed, Springer Singapore, Algorithms for Intelligent Systems (AIS) Book Series, pp. 125-134, DOI - https//doi.org/10.1007/978-981-97-9532-1_11, ISBN - 978-981-97-9531-4, July 23, 2025.
9. Soumitra De and Jaydev Mishra, "Process of Imprecise Data using New Methods of Neutrosophic Set", 10th International conference on ICT for Sustainable Development (ICT4SD 2025), July 17-19, 2025, Springer.
10. Rupsa Sarkar, Jaydev Mishra, "Dependency of Sentiment on its aspect using Large Language Model", 4th World Conference on Information Systems for Business Management (ISBM 2025), September 24-26, 2025, Springer.
11. Siddhartha Chatterjee, Debasish Acharya, Rambilas Ganguly, Bikash Debnath, Sudipta Hazra and Abhinaba Bhattacharyya, "Class Topper Optimization Algorithm based Optimal Cryptographic Technique" In 2025 International Conference on Computing, Intelligence and Applications (CIACON), IEEE Xplore Digital Library, SCOPUS Indexed, pp. 1-6, DOI - 10.1109/CIACON65473.2025.111.89470, ISBN - 979-8-3315-4411_9, October 10, 2025.
12. Siddhartha Chatterjee, Sutirtha Guha, Somasree Bhadra, Sudipta Hazra and Abhinaba Bhattacharyya, "Classical Optimization Problem Solution Using Nature Inspired Algorithm", In 2025 International Conference on Recent Advances in Electrical, Electronics, Ubiquitous Communication and Computational Intelligence (RAEEUCCI), IEEE Xplore Digital Library, SCOPUS Indexed, pp. 1-5, DOI - 10.1109/RAEEUCCI63961.2025.11048319, ISBN - 979-8-4503-9266_1, July 4, 2025.

13. Lipika Datta, "A Novel Hybrid Scheduling Algorithm for Load Balancing in Cloud Computing", 6th International Conference on Electronics and Sustainable Communication systems", 2025 6th International Conference on Electronics and Sustainable Communication Systems (ICESC), IEEE Explore, 10-12 September, 2025, DOI: 10.1109/ICESC65114.2025.11212592
14. Rupsa Sarkar, Jaydev Mishra, "Dependency of Sentiment on its aspect using Large Language Model", 4th World Conference on Information Systems for Business Management (ISBM 2025), September 24-26, 2025, Springer. DOI: 10.1007/978-3-032-13419-6_38
15. Sushovan Das, Uttam Kr. Mondal. "Secure Multi-channel Audio Broadcasting in Wireless Sensor Networks: A Machine Learning-Enabled Encoding Approach", ICACA 2026, Jharkhand University. Springer book series Lecture Notes in Networks and Systems
16. Sushovan Das, Uttam Kr. Mondal. "Blockchain Implied Acoustic Sensor Data Integration in Decentralized Pervasive Wireless Sensor Network", ICACA 2026, Jharkhand University. Springer book series Lecture Notes in Networks and Systems
17. Sushovan Das, Uttam Kr. Mondal. "A Speech-Driven Context-Aware Transformer Framework for Behavioural Risk Detection in Conversational Data", ICACA 2026, Jharkhand University. Springer book series Lecture Notes in Networks and Systems

Patents:

1. D. K. Gayen & Others, "Photonic Logic Circuit for Parallel XOR and XNOR Operations Using TOAD Tree Network", PATENT APPLICATION PUBLICATION, INDIA, Application No. 202531078395 A, The Patent Office Journal No. 35/2025 Dated 29/08/2025
2. D. K. Gayen & Others, "AI-Enabled Crop Yield Estimation Model" PATENT APPLICATION PUBLICATION, INDIA, Application No. 202531102573 A, The Patent Office Journal No. 44/2025 Dated 31/10/2025
3. Sushovan Das, Uttam Kr Mondal, "SYSTEM AND METHOD FOR AUTHENTICATED SINGLE-PATH TRANSMISSION OF SEMANTIC ACOUSTIC DATA IN WIRELESS SENSOR NETWORK" Patent ID - 202631033935 A, Journal No. 18/2026 Dated 01/05/2026
4. Sushovan Das and Others, "Photonic Logic Circuit for Parallel XOR and XNOR Operations Using TOAD Tree Network" Application No. 202531078395 A The Patent Office Journal No. 35/2025 Dated 29/08/2025

Book Chapter:

1. Das, S., Mondal, U.K., Roy, B.B. (2025). Energy Efficient Lossless Audio Encoder for IoT Enable Devices. In: Majumder, M., Zaman, J.S.U., Ghosh, M., Chakraborty, S. (eds) Computational Technologies and Electronics. ICCTE 2023. Communications in Computer and Information Science, vol 2377. Springer, Cham.
2. Roy, B.B., Debnath, A., Das, S., Mondal, U.K. (2026). Efficient Audio CODEC for IoT Devices - Leveraging GANs, Adaptive Quantization and Arithmetic Coding. In: Chandra Mondal, K., Bhattacharya, M., Bhaumik, P., Mukhopadhyay, S., Mandal, J.K., Dutta, P. (eds) Computational Intelligence in Communications and Business Analytics. CICBA 2025. Communications in Computer and Information Science, vol 2863. Springer, Cham.

Electronics and Communication Engineering

Details of Journal Publications

1. D. K. Dey, B. Prasad, G. Palai, and P. Sarkar, "Understanding of Efficient Optical Circuit Using Silicon Waveguide at Third Communication Window," Journal of Optics, doi: 10.1007/s12596-024-02189-y.
2. D. K. Dey, B. Prasad, P. Sarkar, G. Palai, J. S. N. Achary, and M. Pal, "Efficient Photonic Integrated Circuit for Enhanced Optical Communication System," Journal of Optics, doi: 10.1007/s12596-025-02680-0.
3. S. Rana, S. Pramanik, D. Mitra, and C. Koley, "Design and Analysis of Multifunctional Metasurface for Linear and Circular Polarized Incident Wave," Radioengineering, vol. 34, no. 4, pp. 575–582, Dec. 2025, doi: 10.13164/re.2025.0575.

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2. S. Pramanik, D. Das, C. Koley, S. Bhunia, S. Bhaumik, R. K. Sinha, and K. Dinda, "Study on Bandwidth Tuning Metasurface with Polarization Conversion Characteristics," in Proceedings of the Springer Book. Singapore: Springer, ch. 43, pp. 509–516, Nov. 2025, doi: 10.1007/978-981-96-5918-0_43.
3. S. Gayen, S. Maity, and S. Kandar, "On Compressed Sensing Image Encryption for Energy Efficient Transmission over Radio Mobile Channel," in Proceedings of the International Conference held at Dr. S. P. Mukherjee International Institute of Information Technology, Naya Raipur, Chhattisgarh, India, Jan. 14–16, 2026, Springer, (in press).

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2. T. S. Daphadar, T. Santra, and A. B. Choudhury, "Design Optimization of a Permanent Magnet Biased Fault Current Limiter via Pattern Search for High Efficiency and Reduced Material Use," Progress In Electromagnetics Research C, vol. 170, pp. 1–14, 2026.

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1. A. K. Mondal, T. Santra, and T. S. Daphadar, "Mitigating Transformer Inrush Currents Using Passive Magnetic Fault Current Limiter," in Proceedings of the International Conference on Computer, Electrical & Communication Engineering (ICCECE), Kolkata, India, pp. 1–5, 2025, doi: 10.1109/ICCECE61355.2025.10940168.
2. T. S. Daphadar, A. B. Choudhury, T. Santra, and S. Das, "Novel Adaptive PSO for Parameter Tuning in Superconducting Fault Current Limiters," in Proceedings of the 2026 International Conference on Computing, Electronics & Communication Engineering (ICCECE), Kolkata, India, pp. 1–7, 2026, doi: 10.1109/ICCECE69715.2026.11492910.
3. T. S. Daphadar, T. Santra, and A. B. Choudhury, "Parameter Optimization of a Magnetic Fault Current Limiter Using Biogeography-Based Optimization," in Proceedings of the 2026 IEEE International Conference on Emerging Computing and Intelligent Technologies (ICoECIT), Hyderabad, India, pp. 1–5, 2026, doi: 10.1109/ICoECIT68303.2026.11496911.
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5. T. S. Daphadar, T. Santra, and A. B. Choudhury, "Optimized Design and Analysis of a Permanent Magnet-Biased Fault Current Limiter for Power System Protection," in Proceedings of the International Conference on Power, Environment and Intelligent Systems (PEIS 2026). Institution of Engineering and Technology (IET), Apr. 3–4, 2026.
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8. D. Mukharjee, K. Sit, A. Hazra, and T. Maity, "Enhancing economic power delivery: A squirrel search algorithm approach addressing realistic power system constraints," in 2025 IEEE 1st International Conference on Smart and Sustainable Developments in Electrical Engineering (SSDEE-2025), Indian Institute of Technology (Indian School of Mines), Dhanbad, India, Feb. 28–Mar. 2, 2025.

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1. T. S. Daphadar, T. Santra, and A. B. Choudhury, "AI-Based Optimization of Magnetic Fault Current Limiter for Reducing Short-Circuit Energy Stress and Improving Grid Efficiency," in Power Engineering and Intelligent Systems: Proceedings of PEIS 2026, vol. 1. Singapore: Springer, 2026. (Book chapter)

2. T. S. Daphadar, T. Santra, A. B. Choudhury, and S. Das, "Design Optimization of a Magnetic Fault Current Limiter for Reducing Short-Circuit Energy Stress and Material Losses," in Innovations in Power and Energy Sector Using AI Techniques, ch. 9. Boca Raton, FL, USA: CRC Press, Taylor & Francis Group, 2026. (Book chapter)

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2. P. Das, S. Ojha, A. Bhattacharyya, R. Ghosh, A. Naha, R. Bhattacharyya, T. Chakraborty, A. Chakraborty, C. Karmakar, and S. Chatterjee, "Bhabanipur Assembly Election Digital Twin: A GEO-Spatial Multimodal Artificial Intelligence Structure," International Journal of Creative and Open Research in Engineering and Management, vol. 2, no. 4, Mar. 2026, doi: 10.55041/ijcope.v2i4.004.
3. P. Chowdhury, B. Maiti, L. K. Mudi, and S. Chatterjee, "Artificial Intelligence for Sustainable Agriculture: A Review of Machine Learning and Deep Learning Techniques for Crop Growth and Yield Prediction," International Journal of Applied Resilience and Sustainability, vol. 2, no. 3, pp. 176–207, May 2026, doi: 10.70593/deepsci.0203007.

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1. M. Midya, M. Iyasmin, R. S. Poria, and S. A. Ahmed, "Fake News Analyzer: ML-Driven NLP System for Misinformation Detection," in Proceedings of the International Conference on Power, Environment and Intelligent Systems (PEIS 2026), 2026.
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Details of Journal Publications:

1. K. Sinha and D. Sinha Jana, "Detection of Synthetic or Cloned Voices Using Deep Learning and Acoustic Feature Analysis," International Journal of Computer Applications, vol. 187, no. 17, pp. 47–52, Jul. 2025, doi: 10.5120/ijca2025925228.
2. K. Sinha and D. Sinha Jana, "An Intelligent Flood Monitoring Framework Using Deep Convolutional Neural Networks," JONSCN, vol. 11, no. 2, pp. 20–28, Aug. 2025.
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Details of Journal Publications:

1. B. N. Dey and A. Mitra, "Reimagining Indian Knowledge Systems: Integrating Timeless Wisdom into Contemporary Global Thought," Kronika Journal, vol. 25, pp. 400–418, 2025, doi: 10.14148/kkj/v25.4874.
2. S. Pramanik, S. Biswas, S. Jana, and A. Mitra, "Colorectal Cancer (CRC) Detection using Convolutional Neural Network (CNN)," Journal of Mechanics of Continua and Mathematical Sciences, vol. 20, no. 11, pp. 158–166, Nov. 2025, doi: 10.26782/jmcms.2025.11.00010.
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6. A. Banerjee, N. Saha, W. Akram, S. Biswas, and S. Chatterjee, "Handwritten Digit Pattern Recognition by Hybrid of Convolutional Neural Network (CNN) and Boosting Classifier," International Journal of Innovative Science and Research Technology (IJISRT), vol. 10, 2025, ISSN: 2456-2165, doi: 10.38124/IJISRT/25JUL782.
7. S. Biswas, N. L. Rane, and J. Rane, "Enhancing Customer Experience, Engagement, Value Creation, and Loyalty Through Artificial Intelligence and Machine Learning in CRM," International Journal of Applied Resilience and Sustainability, vol. 2, no. 2, pp. 473–502, ISSN: 3108-1622, doi: 10.70593/DEEPSCI.0202019.
8. P. Ghorai, B. Jana, S. Ghorai, and J. Ganguly, "Synthetic Strategy for Multimodal $-NH_2$ Functionalized Chitosan-Based Materials Towards Sustainable Evolution," Carbohydrate Research, vol. 552, Art. no. 109482, 2025, ISSN: 0008-6215, doi: 10.1016/j.carres.2025.109482.

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National / International Conference

1. K. Mondal, T. K. Pal, and H. Chattopadhyay, "Transport Phenomena Under Impinging Annular Jets of Power Law Fluids," in Proc. 28th National and 6th International ISHMT–ASTFE Heat and Mass Transfer Conference (IHMTC 2025), Jodhpur, India, 2025, pp. 393–398.
2. K. Mondal, T. K. Pal, and H. Chattopadhyay, "Numerical Investigation of Heat Transfer and Fluid Flow Under Impinging Annular Jets of Power-Law Fluids," in Proc. 3rd International Conference on Mechanical Engineering (INCOM 2026), Jadavpur, India, 2026.
3. D. K. Adak, A. Maity, S. Jana, and S. Das, "An Investigation on Hot Air Abrasive Jet Machining on Soda Lime Glass Using Silicon Carbide Abrasive," in Proc. 10th International and 31st All India Manufacturing Technology, Design and Research Conference (AIMTDR 2025), IIT Indore, Indore, India, Dec. 11–13, 2025.
4. D. K. Adak, B. C. Gain, and S. Das, "Surface Generation on 316 Stainless Steel Using Silicon Carbide Abrasive," presented at the 5th Research Colloquium (RESCOL-V), Birla Institute of Technology Mesra, Ranchi, India, Jul. 13–14, 2025.

National / International Journal

1. D. K. Adak, B. C. Gayen, S. Das, and B. Haldar, "Experimental Investigation into Abrasive Jet Drilling on Soda Lime Glass at 8 kg/cm² System Pressure," Reason: A Technical Magazine, Kalyani Government Engineering College, ISSN: 2277-1654, Paper ID: Reason 2025-06, 2025. Accepted after review on May 24, 2026.

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1. D. K. Adak, B. C. Gain, S. Das, and B. Haldar, "Surface Preparation with Abrasive Jet Erosion on SS 316 Using Silicon Carbide," in Advanced Engineering Optimization Through Intelligent Techniques, vol. 1438, Lecture Notes in Electrical Engineering, Singapore: Springer Nature Singapore Pte. Ltd., 2026.
2. D. K. Adak, S. Misra, S. Das, N. A. Alsaleh, and B. Haldar, "Optimization of Abrasive Jet Drilling on Alumina Plate Using Silicon Carbide Abrasive," in Advanced and Futuristic Trends in Machining, Vol. II, Lecture Notes in Mechanical Engineering. Singapore: Springer Nature Singapore Pte. Ltd., 2026.

College of Engineering and Management, Kolaghat

Details of recruitment drives organised for the year 2025-26 (for 2026 pass out batch) as on 20-06-2026

Sl. No.	Date of Drive	Name of the recruiting organisation	Eligible streams
1	31-07-2025	WPG Electronics India (P)Limited	ECE, EE
2	01-08-2025	Syren Cloud	CSE, IT
3	14-08-2025	Visteon Corporation	CSE, ECE, IT
4	19-08-2025	Deltecs Infotech	CSE, ECE, IT
5	02-09-2025	NRI Fintech	CSE, IT
6	29-10-2025	Poornam Info Vision	CSE, IT
7	31-10-2025	Utkarsh India	EE, ME
8	03-11-2025	Keyence India	ECE, EE, ME
9	05-11-2025	Sisir Radar	ECE
10	05-11-2025	Greenwave Solutions	ECE, EE
11	08-11-2025	Aponiar Solution Private Limited	CSE, IT, ECE, EE
12	13-11-2025	Consat Orahi	CSE, IT, ECE
13	13-11-2025	Windcare India	ECE, EE, ME
14	17-11-2025	LearnFlu Edutech	CSE, IT, ECE, EE, ME
15	19-11-2025	Thatha Group, Bangalore	CSE, IT
16	19-11-2025	AKOVA Fintech Solutions	CSE, IT
17	19-11-2025	Debsons Pumps	EE, ME
18	20-11-2025	Entraco Group	EE
19	20-11-2025	Manikaran Power Limited	ECE, EE
20	21-11-2025	Infosys Technologies Ltd.-HackwithInfy	CSE, IT, ECE
21	22-11-2025	Cyfuture India	CSE, IT
22	26-11-2025	AppVin Technologies	CSE, IT, ECE
23	29-11-2025	X-Byte Enterprise	CSE, IT
24	06-12-2025	Chelson Gordon Consultancy	CSE, IT
25	06-12-2025	Tech Ridge Solutions	CSE, IT, ECE
26	07-12-2025	Bavis Technologies	CSE, IT, ECE
27	08-12-2025	Acxiom Consulting	CSE, IT
28	09-12-2025	TechnoMastic Solutions	CSE, IT, ECE
29	10-12-2025	Rinex Technologies	CSE, IT, ECE, EE, ME
30	18-12-2025	Marathon Electric Motors	EE, ME
31	20-12-2025	DexGreen India	ECE, EE, ME
32	22-12-2025	Eduvizo	CSE, IT, ECE, EE
33	22-12-2025	Shree Abirami Engg. Works	EE
34	22-12-2025	Codeyoung	CSE, IT, ECE, EE, ME

Sl. No.	Date of Drive	Name of the recruiting organisation	Eligible streams
35	23-12-2025	Techimpace Innovation	CSE, IT
36	26-12-2025	Techno India Manufacturing & Engg. Services	ME
37	02-01-2026	Vishakha Group	ECE, EE, ME
38	06-01-2026	ZenYData Technologies	CSE, IT, ECE
39	08-01-2026	CAF Technologies	CSE, IT, ECE
40	08-01-2026	MKC Infrastructure	ME
41	09-01-2026	PlanetSpark	CSE, IT, ECE
42	10-01-2026	Quality Austria Central Asia	ECE, EE, ME
43	12-01-2026	Meditab	CSE, IT, ECE, EE, ME
44	13-01-2026	Rudder Analytics	CSE, IT
45	17-01-2026	Keross Research & Development Centre	CSE, IT
46	19-01-2026	SilverSky Technologies	CSE, IT, ECE
47	20-01-2026	Synnova Gears	EE
48	31-01-2026	Teleperformance India	CSE, IT, ECE, EE, ME
49	03-02-2026	Acxiom Consulting	CSE, IT
50	04-02-2026	Keeves Technologies	CSE, IT, ECE
51	05-02-2026	Corelynx Solutions	CSE, IT
52	05-02-2026	IBM CIC Hiring	CSE, IT
53	06-02-2026	Flender Drives Pvt. Ltd.	ME
54	06-02-2026	Nucleus Software	CSE, IT
55	06-02-2026	Teknoconstant Energy	ECE, EE
56	07-02-2026	Motherson Automotive Technologies & Engg	ECE, EE, ME
57	10-02-2026	Utah Tech Labs	CSE, IT
58	12-02-2026	Consultadd	CSE, IT, ECE
59	13-02-2026	ATM Softek	CSE, IT
60	14-02-2026	Rashmi Group	EE, ME
61	16-02-2026	Assurex e-Consultant	CSE, IT
62	19-02-2026	Sutherland	CSE, IT, ECE, EE
63	21-02-2026	Sett Consultants	CSE, IT, ECE
64	24-02-2026	Teachouts Solutions Pvt. Ltd.	CSE, IT
65	26-02-2026	Apollo Tyres Ltd.	ECE, EE, ME
66	26-02-2026	Nest Innovative Solutions	CSE, IT
67	26-02-2026	APPSeCONNECT	CSE, IT, ECE, EE, ME
68	27-02-2026	Underscore Technology	CSE, IT
69	28-02-2026	Qspiders	CSE, IT, ECE
70	02-03-2026	Siechem Technologies	ECE, EE, ME
71	06-03-2026	Inosystek Solution	ECE, EE
72	23-03-2026	Vikram Solar	ECE, EE, ME

Sl. No.	Date of Drive	Name of the recruiting organisation	Eligible streams
73	24-03-2026	Indus Tower	ECE, EE
74	26-03-2026	Alsol Technology Solution	CSE, IT, ECE
75	26-03-2026	Quality Kiosk Technologies	CSE, IT, ECE
76	08-04-2026	Assurex e-Consultant	CSE, IT
77	10-04-2026	A1 Fence Products	EE, ME
78	13-04-2026	Skipper Ltd.	EE, ME
79	22-04-2026	Surelia Infosystems	CSE, IT ECE
80	25-04-2026	Sauryajyoti Renewables	ECE, EE, ME
81	27-04-2026	Modine Thermal Systems	ECE, EE, ME
82	27-04-2026	Zensar Technologies	CSE, IT
83	05-05-2026	Ramsarup Industries (Shyam Metalics)	EE, ME
84	07-05-2026	Tata Consultancy Services - NQT	CSE, IT, ECE, EE, ME
85	23-05-2026	InGreens	CSE, IT
86	25-05-2026	Brainium Information Technologies	CSE, IT
87	28-05-2026	Rialto Enterprises	ECE, EE, ME
88	02-06-2026	R R Kabel	ECE, EE, ME
89	09-06-2026	Injotech India	EE
90	15-06-2026	Lincoln Electric Company (India) Pvt Ltd.	ECE, EE
91	16-06-2026	CloudKaptan	CSE, IT, ECE
92	17-06-2026	BTL EPC Limited	EE, ME
93	17-06-2026	Kaynes Technology India	CSE, ECE, EE
94	19-06-2026	SPR Auto Interior Solutions	ECE, EE

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Carrier-Reservoir SOAs for Ultrafast Optical Processing

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Abstract: Carrier-Reservoir Semiconductor Optical Amplifiers (CR-SOAs) are emerging as high-speed nonlinear photonic devices capable of overcoming the gain recovery limitations of conventional bulk SOAs. By incorporating an additional carrier reservoir layer adjacent to the active region, CR-SOAs enable ultrafast carrier replenishment in the order of 0.5–5 ps. This property significantly enhances switching speed, reduces pattern dependence, and improves extinction ratio performance. This paper presents device structure, mathematical modeling, switching configurations, and major applications of CR-SOAs in optical logic, wavelength conversion, and photonic computing. Recent research developments are incorporated to strengthen the technological relevance of CR-SOAs for next-generation optical networks.

Keywords: Carrier-Reservoir SOA, Optical Switching, All-Optical Logic, Gain Dynamics, Photonic Computing.

1. Introduction

Semiconductor Optical Amplifiers (SOAs) are fundamental building blocks in photonic integrated circuits due to their compact size, integrability, and capability to provide optical gain without optical–electrical–optical (O/E/O) conversion. These properties make them highly attractive for optical communication and signal processing systems. However, conventional bulk SOAs suffer from relatively slow carrier recovery times, typically in the range of 100–500 ps, which significantly limits their applicability in ultrafast optical networks and high-bit-rate signal processing. To overcome this limitation, Carrier-Reservoir Semiconductor Optical Amplifiers (CR-SOAs) were introduced by incorporating a higher bandgap carrier reservoir layer adjacent to the active region. This additional reservoir layer acts as a rapid carrier supplier, enabling efficient carrier replenishment in the depleted active region within 0.5–5 ps. As a result, CR-SOAs exhibit substantially faster gain recovery, reduced pattern dependence, and improved nonlinear phase response compared to conventional bulk SOAs. The concept was experimentally validated by H. Sun et al. [1], who demonstrated enhanced gain dynamics and reduced saturation effects in CR-SOA structures. By combining the fabrication simplicity and integrability of bulk SOAs with gain recovery characteristics comparable to advanced quantum-structured devices, CR-SOAs offer an optimal trade-off between performance and manufacturability. These

features make them highly suitable for ultrafast all-optical logic operations, wavelength conversion, optical regeneration, and photonic computing applications.

2. Device Structure and Modeling

A Carrier-Reservoir Semiconductor Optical Amplifier (CR-SOA) consists of two primary functional layers: the Active Region (AR) and the Carrier Reservoir (CR). The active region is responsible for stimulated emission and optical gain generation through electron–hole recombination. In contrast, the carrier reservoir is formed by a higher bandgap layer positioned adjacent to the active region, which stores carriers and rapidly transfers them to the AR during carrier depletion. The presence of the carrier reservoir significantly modifies the carrier dynamics compared to conventional bulk SOAs. When an intense optical pulse propagates through the device, carriers in the AR are depleted due to stimulated emission. In a CR-SOA, the carrier reservoir acts as a fast carrier supplier, replenishing the depleted carriers through inter-layer carrier transfer mechanisms. This results in ultrafast gain recovery in the range of 0.5–5 ps, substantially improving switching speed and reducing pattern-dependent distortion. The dynamic behavior of a CR-SOA can be described using coupled nonlinear rate equations representing carrier densities in the active region NAR and the carrier reservoir NCR. These equations account for carrier injection, spontaneous recombination, stimulated emission, and carrier exchange between the two layers. The carrier transfer term plays a crucial role in accelerating gain recovery and enhancing device nonlinearity. The instantaneous gain of the CR-SOA can be expressed as:

$$G(t) = \exp[h_{AR}(t)+h_{CH}(t)+h_{SHB}(t)]$$

where $h_{AR}(t)$ represents the gain contribution from the active region carrier density, $h_{CH}(t)$ corresponds to carrier heating effects caused by intraband energy redistribution, and $h_{SHB}(t)$ denotes spectral hole burning effects resulting from nonuniform carrier depletion in the gain spectrum. The inclusion of carrier heating (CH) and spectral hole burning (SHB) is essential for accurately modeling ultrafast gain suppression and phase modulation in high-bit-rate applications. These nonlinear mechanisms significantly influence cross-gain modulation (XGM) and cross-phase modulation (XPM) performance in CR-SOA-based switching architectures.

3. Switching Configurations

Carrier-Reservoir Semiconductor Optical Amplifiers (CR-SOAs) are extensively employed in ultrafast all-optical switching architectures due to their rapid gain recovery, strong nonlinear response, and improved phase modulation characteristics. The most prominent switching configurations include Mach–Zehnder Interferometer (MZI)-based structures, Cross-Gain Modulation (XGM), and Cross-Phase Modulation (XPM) schemes.

3.1 CR-SOA-Based Mach–Zehnder Interferometer (CRSOA-MZI)

Among the available configurations, the CRSOA-MZI structure offers the highest switching performance. In this arrangement, two CR-SOAs are incorporated into the arms of a Mach–Zehnder Interferometer. A control pulse injected into one arm induces carrier depletion in the active region, resulting in both gain modulation and refractive index variation. The refractive index change produces a phase shift between the two interferometer arms. Depending on the magnitude of the induced phase difference, constructive or destructive interference occurs at the output port. Because of the ultrafast carrier replenishment provided by the carrier reservoir, the phase and gain recovery processes occur within a few picoseconds. This enables switching speeds exceeding 100 Gb/s, with high extinction ratio and reduced pattern dependence. CRSOA-MZI configurations are particularly suitable for implementing optical logic gates, wavelength converters, multiplexers, and arithmetic circuits.

3.2 Cross-Gain Modulation (XGM)

In the XGM configuration, a strong control signal modulates the gain of the CR-SOA, which in turn affects a co-propagating or counter-propagating probe signal. When the control pulse depletes carriers in the active region, the gain experienced by the probe decreases, leading to intensity modulation at the output. Although XGM-based switching is structurally simpler than interferometric schemes, it generally provides a lower extinction ratio and may exhibit residual pattern effects. However, the fast recovery dynamics of CR-SOAs significantly improve XGM performance compared to conventional bulk SOAs, enabling higher-speed wavelength conversion and signal regeneration.

3.3 Cross-Phase Modulation (XPM)

Cross-phase modulation exploits carrier-induced refractive index changes inside the CR-SOA. A strong control pulse alters the carrier density, which modifies the refractive index through the linewidth enhancement factor. This induces a phase shift on a probe signal passing through the device. When combined with an interferometric structure, such as an MZI, the phase modulation is converted into intensity modulation. CR-SOAs exhibit enhanced nonlinear phase response due to rapid carrier redistribution between the reservoir and active region. As a result, XPM-based configurations provide higher switching contrast and improved stability for high-bit-rate operations.

4. Applications

Carrier-Reservoir Semiconductor Optical Amplifiers (CR-SOAs) have emerged as highly versatile nonlinear devices for ultrafast photonic signal processing. Their ultrafast

gain recovery, enhanced phase modulation capability, and reduced pattern dependence make them particularly suitable for high-bit-rate all-optical systems.

4.1 All-Optical Logic and Arithmetic Circuits

CR-SOAs are extensively used in the realization of high-speed all-optical logic gates such as AND, OR, NOR, XOR, and XNOR, primarily implemented using CRSOA-MZI architectures. The ultrafast carrier replenishment enables stable switching windows with high extinction ratio (ER) and contrast ratio (CR), even at data rates exceeding 100 Gb/s. Recent studies [4–6] have demonstrated 120 Gb/s encoder and comparator circuits, high-performance NOR gates, and optical binary incrementors based on CR-SOA-MZI structures. These designs exhibit improved cascadability and reduced signal distortion compared to bulk SOA implementations. The fast recovery dynamics also minimize inter-symbol interference, which is critical for multi-stage optical computing circuits.

4.2 Optical Encryption and Secure Communication

CR-SOAs are increasingly being applied in ultrafast optical encryption and decryption systems. By exploiting nonlinear gain and phase modulation characteristics, secure data encoding can be achieved entirely in the optical domain. High-speed encryption architectures operating at 120 Gb/s have been reported using CR-SOA interferometric configurations, demonstrating strong potential for next-generation secure optical networks.

4.3 Wavelength Conversion and Signal Regeneration

In wavelength-division multiplexed (WDM) systems, CR-SOAs are employed for high-speed wavelength conversion using cross-gain modulation (XGM) and cross-phase modulation (XPM). Their enhanced nonlinear response enables efficient frequency translation with improved signal integrity. Additionally, CR-SOAs are used in optical regeneration systems for signal reshaping and re-amplification. The fast carrier dynamics reduce pattern effects and improve eye-diagram quality, making them suitable for long-haul and high-capacity optical communication links.

4.4 Photonic Neural and Computing Platforms

With the growing interest in photonic computing and neuromorphic systems, CR-SOAs are being explored as nonlinear activation elements in optical neural networks. Their strong gain saturation characteristics and ultrafast response allow them to emulate nonlinear activation functions required for optical information processing. Integration of CR-SOAs within photonic integrated circuits enables compact, energy-efficient, and high-speed computing architectures.

5. Comparative Performance

Comparative performances of different SOAs are shown in Table 1. Compared to Bulk SOAs, Quantum-Dot SOAs, and Reflective SOAs, CR-SOAs provide an optimal trade-off between speed, fabrication complexity, and scalability. Gain recovery of 0.5–5 ps enables operation beyond 100 Gb/s while maintaining moderate fabrication complexity compared to QD-SOAs.

Table 1: Comparative performance of different SOAs

SOA Type	Gain Recovery	Speed	Fabrication Complexity	Scalability
Bulk SOA	100–500 ps	<40 Gb/s	Low	High
Quantum Dot SOA	1–10 ps	~160 Gb/s	Very High	Limited
Reflective SOA	50–200 ps	Moderate	Moderate	Moderate
CR-SOA	0.5–5 ps	>100 Gb/s	Moderate	High

6. Conclusion

Carrier-Reservoir Semiconductor Optical Amplifiers represent a significant advancement in ultrafast photonic devices. By introducing a carrier reservoir layer near the active region, CR-SOAs drastically reduce gain recovery time and enhance nonlinear performance. Compared to bulk, quantum-dot, and reflective SOAs, CR-SOAs provide an optimal balance of speed, scalability, and fabrication simplicity. Their integration into interferometric structures such as Mach–Zehnder interferometers enables high-speed all-optical logic and computing operations beyond 100 Gb/s. Therefore, CR-SOAs are strong candidates for next-generation optical networks, photonic processors, and all-optical computing systems.

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TAC Annual Events Report 2025-26

Prepared by:
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CSE/23/115

Foreword

The Technical Activities Committee (TAC) of the College of Engineering and Management, Kolaghat (CEMK), is dedicated to fostering a culture of technical excellence, creative innovation, and collaborative problem-solving among students. The 2025–26 academic year witnessed a vibrant calendar of student-driven events that tested programming skills, engineering ingenuity, artistic vision, and entrepreneurial thinking.

This report consolidates the official documentation of four flagship events organised under the banner of TAC during the academic year: the Short Film and Photography Competition (March 2026), the Inter-College Hackathon (April 2026), the Robotics Competition — Robotics 2K26 (April 2026), and the C Coding Competition 2K26 (June 2026). Together, these events engaged hundreds of students from across departments, providing them a platform to showcase their talents beyond the classroom.

Members of the Technical Activities Committee (TAC)

Sl. No.	Name
1.	Prof. (Dr.) Deb Kumar Adak
2.	Prof. (Dr.) Indrajit Ghosh
3.	Prof. Debottam Das
4.	Prof. Rinku Khatua
5.	Mr. Biswajit Majumder
6.	Mr. Saradindu Chakraborty

Overall Summary of TAC Events — Academic Year 2025–26

Event	Date	Participants / Teams	Format
Short Film & Photography Competition	March 28, 2026	16 photographers; 3 film teams in finals	Two-round (screening + faculty judging)
Inter-College Hackathon	April 18, 2026	14 teams	Single-round pitch + prototype demo

Event	Date	Participants / Teams	Format
Robotics 2K26	April 18, 2026	11 teams, 58 participants	Three parallel events
C Coding Competition 2K26	June 17, 2026	118 registered, 39 in Round 1 and 15 in Round 2	Two-round (MCQ + Implementation)

EVENT 1

Short Film & Photography Competition

Department of Computer Science and Engineering, CEMK | March 28, 2026

1.1 Executive Summary

This section documents the successful execution of two major creative events — the Intra-College Short Film Competition and the Photography Competition— organised by the Department of Computer Science and Engineering at CEMK. Both events were conducted in March 2026 and were designed to nurture visual storytelling, artistic vision, and technical creativity among students across all departments.

Each competition followed a two-stage format: an initial internal screening round in which entries were evaluated and shortlisted, followed by a final round in which a panel of faculty judges formally assessed and scored the works.

1.2 Event Overview

Events	Short Film Competition & Photography Competition
Month	March 2026
Final Round Date	March 28, 2026
Venue	College of Engineering and Management, Kolaghat
Organising Body	Department of Computer Science and Engineering
Participants	Students from all departments of the college

1.3 Competition Format

Round 1 — Internal Screening

All submitted entries were internally screened by a faculty committee to assess baseline quality, theme relevance, and technical competence. The most promising entries were shortlisted and their creators formally invited to the final judging round.

Round 2 — Final Judging by Faculty Panel

The final round was presided over by a panel of faculty judges from the department. Each judge independently evaluated the submitted works across defined criteria and assigned scores. Final rankings were determined based on aggregate scores, ensuring a merit-based and transparent outcome.

Both the rounds were entirely prepared, judged, and evaluated by Prof. Avishake Kar & Mr. Avijit Kumar Adak.

1.4 Photography Competition

The Photography Competition invited students to submit photographs capturing the essence of a given theme. Participants were free to use any camera device — DSLRs, mirrorless cameras, or smartphones.

Judging Criteria

Criterion	Description
Composition	Framing, rule of thirds, and visual balance
Lighting & Exposure	Effective use of natural or artificial light
Creativity & Theme Alignment	Originality and relevance to the competition theme
Technical Precision	Sharpness, focus, colour accuracy, and post-processing

Participants — Photography Competition

Sl. No.	Student Name	Roll No.	Email Address
1	Rupak Sen	ECE/23/12	ece23012@cemk.ac.in
2	Supriya Naskar	CSE/24/060	cse24060@cemk.ac.in
3	Debabrata Bhowmik	CSE/25/295	cse25295@cemk.ac.in
4	Anirban Pradhan	CSE/24/011	cse24011@cemk.ac.in
5	Pramik Makhal	CSE/24/055	cse24055@cemk.ac.in
6	Koushik Maity	AIML/25/024	aiml25024@cemk.ac.in
7	Sindrela Mondal	AIML/23/36	aiml2336@cemk.ac.in
8	Srawan Singh Rajput	AIML/23/16	aiml2316@cemk.ac.in
9	Ranit Das	CSE/23/119	cse23119@cemk.ac.in
10	Soumili Patra	CSE/23/L-210	cse23l210@cemk.ac.in
11	Debasish Das	CSE/24/148	cse24148@cemk.ac.in
12	Souvik Ganda	CSE/24/146	cse24146@cemk.ac.in
13	Gouranga Jana	CSE/24/102	cse24102@cemk.ac.in
14	Subhranil Bag	CSE/24/103	cse24103@cemk.ac.in
15	Pabitra Bera	CSE/24/057	cse24057@cemk.ac.in
16	Ajoy Dhara	CSE/24/135	cse24135@cemk.ac.in

Results — Photography Competition

Photography Competition — Final Results	
1st	Srawan Singh Rajput | AIML/23/16 | aiml2316@cemk.ac.in
2nd	Supriya Naskar | CSE/24/060 | cse24060@cemk.ac.in
3rd	Sindrela Mondal | AIML/23/36 | aiml2336@cemk.ac.in

1.5 Short Film Competition

The Short Film Competition challenged students to craft compelling narratives through the medium of cinema. Teams were required to conceptualise, film, edit, and submit a short film not exceeding a stipulated duration. All submissions were initially screened internally, and teams that cleared the screening were selected for the Final Screening and Judging event on March 28, 2026.

Judging Criteria

Criterion	Description
Originality & Concept	Uniqueness of story idea and creative vision
Screenplay & Narrative	Coherence, pacing, and depth of the narrative
Direction & Cinematography	Framing, shot composition, and visual storytelling
Sound Design & Editing	Audio quality, background score, and editing finesse
Theme Adherence	Relevance to the stipulated theme and overall impact

Selected Teams — Final Round (March 28, 2026)

Sl. No.	Team Leader	Roll No.	Team Members	Position
1	Diyasi Nag	ECE/23/04	Diyasi Nag (ECE/23/04), Ankika Das (ECE/23/05)	1st
2	Alankrita Maiti	CSE/25/009	Ankita Maity (CSE/25/239), Puja Jana (AIML/25/037), Sayan Samanta (ME/25/15)	2nd
3	Sanket Ghorai	CSE/25/051	Ritam Kumar Jana (CSE/25/068), Gourish Pal (CSE/25/058)	3rd

1.6 Conclusion

Both the Short Film Competition and the Photography Competition were resounding successes, reflecting the growing creative and technical potential of students at CEMK. The structured two-round format ensured a fair and comprehensive evaluation, while the involvement of a faculty judging panel lent credibility and academic rigour to the results.

The events drew enthusiastic entries from students across CSE, ECE, AIML, and ME departments, highlighting the cross-disciplinary appeal of creative competitions.

EVENT 2

Inter-College Hackathon

Department of Computer Science and Engineering, CEMK | April 18, 2026

2.1 Executive Summary

This section documents the Inter-College Hackathon organised by the Department of Computer Science and Engineering at CEMK. The event brought together student teams to ideate, build, and present innovative solutions in a single competitive round. A total of 14 teams participated, spanning hardware prototypes and software applications including websites and mobile apps. As this was an inter-college hackathon, the judging authority was vested entirely in an external judge — an industry-recognised academician — ensuring complete impartiality and professional rigour.

2.2 Event Overview

Event	Inter-College Hackathon
Organising Body	Department of Computer Science and Engineering, CEMK
Date	April 18, 2026
Venue	College of Engineering and Management, Kolaghat
Participating Teams	14 teams
Format	Single-round presentation and prototype demonstration

2.3 Event Format

Idea Presentation

Teams presented the problem statement they aimed to solve, the rationale behind their approach, and the innovation their solution brought to the domain. Clarity of concept, feasibility, and potential real-world impact were key aspects evaluated during this segment.

Prototype Demonstration

Each team demonstrated a working prototype — physical models for hardware-based projects, and functional websites or applications for software-based ones. A working prototype was mandatory; conceptual designs without a functional model were not accepted.

2.4 External Judge

Name	Prof. Debasish Biswas
Department	Department of Computer Science & Technology
Institution	Women's Polytechnic, Chandernagore
Affiliation	Govt. of West Bengal

Judging Criteria

Criterion	Description
Problem Statement & Innovation	Clarity of the problem identified and novelty of the proposed solution
Technical Feasibility	Practicality and soundness of the technical approach adopted
Prototype Completeness	Degree to which the working model fulfils the stated objectives
Presentation & Communication	Clarity, confidence, and effectiveness of the team's pitch
Impact & Scalability	Potential real-world applicability and scope for scaling the solution

2.5 Participating Teams

Sl. No.	Team Name	Team Leader	Team Members
1	Xenon	Arghadeep Chakraborty	Moulisha Roy, Abhiroop Mukherjee, Sujay Dutta, Pallab Dey (CSE/23/170)

Sl. No.	Team Name	Team Leader	Team Members
2	Logic Loops	Alankrita Maiti	Ankita Maity (CSE/25/239), Arpan Maity (CSE/25/057), Sanket Ghorai (CSE/25/051), Saswati Manna (CSE/25/059), Sreyasree Thandar (CSE/25/060)
3	Astronudge	Sayantan Paul	Pubali Sarkar (CSE/22/148), Parthib Pal (CSE/22/098), Sritanu Maity (CSE/22/147), Soumyajit Maity (CSE/22/101)
4	Yukti	Krishna Prasad Khamrai	Dibbyan Ghosh (ECE/25/07), Nayan Narayan Mondal (ECE/25/06), Sanchita Maity (CSE/25/185), Arunabha Mishra (CSE/25/294), Debalina Ghosh (CSE/25/131)
5	Green Tech	Vivek Giri	Anusri Ruidas (IT/23/10), Suvajit Mondal (IT/23/37), Anubhav Basuli (IT/23/31), Dipanwita Ghara (IT/23/16), Avik Mitra (IT/23/12)
6	LabSphere	Akshay Kumar Dhara	Ritam Kumar Jana (CSE/25/068), Gourish Pal (CSE/25/058), Anwesha Ghosh (CSE/25/067), Soumili Metya (CSE/25/069), Avhijit Nandigrami (CSE/25/080)
7	HACKSPIRE	Indranil Samanta	Arijit Sardar (CSE/25/046), Neha Kumari Yadav (CSE/25/034), Saptak Samanta (CSE/25/049), Bindeswar Das (CSE/25/179)
8	GEN NEXUS	Prantik Kolay	Debangshu Midya (CSE/25/054), Dipti Das (CSE/25/235), Arin Samanta (CSE/25/032), Diptarka Mallik (CSE/25/013)
9	IGNITE	Aparajita De	Pritam Singh (AIML/24/012), Debanshu Guchhait (AIML/24/005), Anwesha Santra (AIML/24/007), Shreya Das (AIML/24/003), Sopan Sundar Bhukta (AIML/24/001)
10	Code Reflex	Sayak Bhattacharya	Soham Bhattacharyya (CSE/23/100), Sirsendu Hazra (CSE/23/139), Sneha Kumari (CSE/23/150), Sohandev Karmakar (CSE/23/133), Sk Habib Hossain (CSE/23/118)
11	CodeX	Krishan Dolui	Shyamal Bera (CSE/24/039), Sagnik Ghosh (CSE/24/036), Trisa Ghanta (CSE/25/019), Arpan Mondal (CSE/24/093), Anal Adhikari (CSE/24/027)

Sl. No.	Team Name	Team Leader	Team Members
12	OMNICORN ROBOTICS	Akash Patra	Sudipta Manna (ECE/22/60), Souvik Kumar Sau (ECE/22/64), Sreejan Das (ECE/23/016), Sohima De (ECE/23/014), Sourav Ghosh (ECE/23/017)
13	Imposters	Tathagata Debnath	Tandrila Chakraborty (AIML/23/27), Srijeet Kumar Bhowmik (CSE/23/045), Rupayan Bhattacharya (CSE/23/066), Siddhartha Bose (AIML/23/23)

2.6 Results

Inter-College Hackathon — Final Results	
1st	Code Reflex | Sayak Bhattacharya | cse23089@cemk.ac.in
2nd	OMNICORN ROBOTICS | Akash Patra | ece2245@cemk.ac.in
3rd	Xenon | Arghadeep Chakraborty | cse23136@cemk.ac.in

2.7 Conclusion

The Inter-College Hackathon was a resounding success, providing a competitive yet collaborative platform for students to showcase their technical creativity and problem-solving capabilities. The single-round format — combining an idea pitch with a mandatory working prototype — ensured that only teams with genuinely functional solutions were recognised. The enthusiasm and quality of submissions strongly encourage the department to continue hosting inter-college hackathons in future academic years.

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EVENT 3

Robotics 2K26

Annual Robotics Competition — Line Follower | RoboRace | RoboWar | April 18, 2026

Total Registered Teams: 11 | Total Participants: 58

3.1 Introduction

Robotics 2K26 brought together student teams from across departments to design, build, and operate autonomous and remote-controlled robots in three competitive formats: Line Follower, RoboRace, and RoboWar. The event was conceived to encourage hands-on engineering skills, teamwork, and innovation in embedded systems and robotics.

A total of 11 teams comprising 58 participants registered across the three events. Teams were scheduled across two slots — Slot 1 (Tuesday and Thursday, 5 PM to 8 PM) and Slot 2 (Wednesday and Friday, 5 PM to 8 PM) — to ensure smooth conduct across all rounds. All types of Robo Events were entirely prepared, judged, and evaluated by Prof. Tanushree Jana.

3.2 Competition Events

Line Follower

An Arduino-based autonomous bot is required to follow a black line drawn on the race sheet without manual intervention. Teams are judged on speed, accuracy, and the bot's ability to stay on track through curves and turns using line-sensing logic.

RoboRace

A manually operated bot must navigate a race track featuring a series of hurdles, each carrying a different point value. Points are awarded for successfully clearing each hurdle, while penalties apply for restarting a run, repositioning the bot, or skipping a hurdle.

RoboWar

A head-to-head combat event in which two bots fight within a fixed time limit. Points are awarded for successful hits and combos landed on the opposing bot. The team accumulating the higher score by the end of the bout is declared the winner.

3.3 Participation Summary

Event	Registered Teams	Slot Schedule
Line Follower	8	Slot 1 & Slot 2
RoboRace	6	Slot 1 & Slot 2
RoboWar	6	Slot 1 & Slot 2
Total Registered Teams (Overall)	11	—

3.4 Team Directory

Team Name	Team Leader	Roll No.	Events Participated	Slot
Robolog	Gourab Biswas	CSE/24/046	RoboWar, RoboRace	Slot 2
Botzilla	Uruj Haider	CSE/25/292	RoboWar, RoboRace	Slot 2
Robo-Sapiens	Mahavis Alam	CSE/25/048	RoboWar, RoboRace, Line Follower	Slot 1
Phoenix	Sayan Samanta	ECE/24/011	RoboRace, RoboWar	Slot 2
Quantum Gear	Ranit Roy	ECE/25/04	Line Follower	Slot 1
Ard Infinity	Arunava Das	AIML/25/113	RoboWar, RoboRace, Line Follower	Slot 2
Yukti	Nayan Mondal	ECE/25/06	Line Follower	Slot 1
Roboverse	Nibedita Das	ECE/24/015	RoboWar, RoboRace, Line Follower	Slot 2
Trace IQ	Diyasi Nag	ECE/23/04	Line Follower	Slot 1
Flashtrack	Sastika Majumdar	AIML/24/014	Line Follower	Slot 2
AutoBots	Soumalya Chatterjee	AIML/25/051	RoboRace, Line Follower	Slot 2

3.5 Results

Line Follower — Final Standings	
1st	Ard Infinity | Arunava Das (AIML/25/113)
2nd	AutoBots | Soumalya Chatterjee (AIML/25/051)
3rd	Roboverse | Nibedita Das (ECE/24/015)

RoboRace — Final Standings	
1st	Robo-Sapiens | Mahavis Alam (CSE/25/048)
2nd	Phoenix | Sayan Samanta (ECE/24/011)
3rd	Roboverse | Nibedita Das (ECE/24/015)

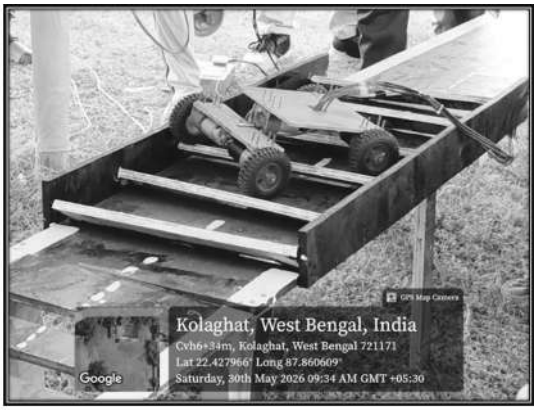
RoboWar — Final Standings	
1st	Robolog | Gourab Biswas (CSE/24/046)
2nd	Phoenix | Sayan Samanta (ECE/24/011)
3rd	Robo-Sapiens | Mahavis Alam (CSE/25/048)

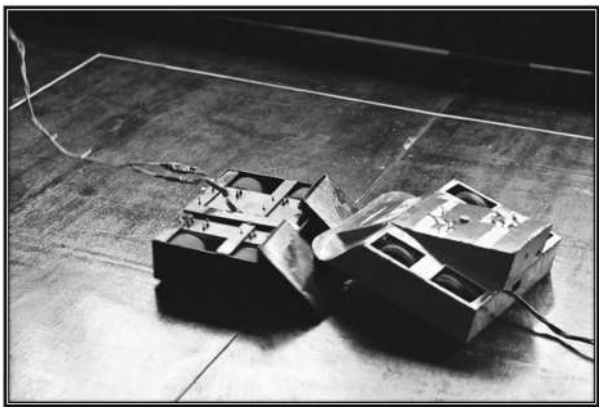
3.6 Highlights & Notable Performances

Team	Achievement
Roboverse	Podium finishes in both Line Follower (3rd) and RoboRace (3rd) — consistent performance across categories
Phoenix	2nd place in both RoboRace and RoboWar — strong all-round bot design
Robo-Sapiens	1st in RoboRace and 3rd in RoboWar — one of the most versatile teams
Ard Infinity	Topped Line Follower — precise sensor calibration and control logic
Robolog	Dominated RoboWar — consistent hits and combos for 1st place

3.7 Conclusion

Robotics 2K26 concluded successfully with enthusiastic participation across all three events. The competition showcased participants' growing expertise in embedded systems, autonomous navigation, mechanical design, and combat robotics. The organising committee congratulates all winners and participating teams, and looks forward to an even larger turnout in the next edition.





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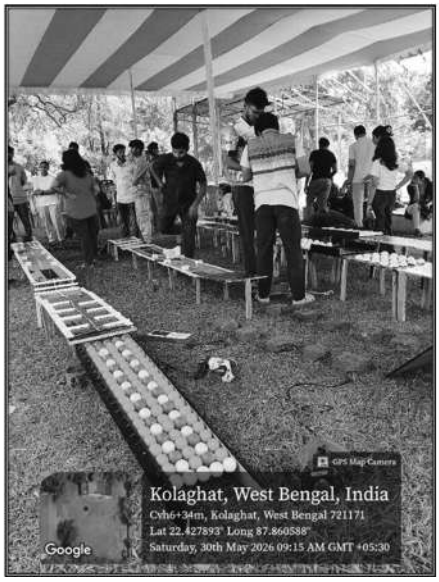
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EVENT 4

Coding Competition 2026

Annual Coding Competition — MCQ Round | Implementation Round | June 17, 2026

Total Registered Participants: 118 | Labs Utilised: 6

4.1 Introduction

The C Coding Competition 2K26 was organised by the Technical Activities Committee (TAC) of CEMK as the concluding flagship technical event of the 2025–26 academic year. The competition was designed to test students' proficiency and problem-solving ability in the C programming language, spanning both conceptual knowledge and practical implementation.

A total of 118 students from across multiple departments registered and competed on June 17, 2026, making it one of the largest participation-based events of the academic calendar. The competition was conducted across 6 computer laboratories to ensure fair and smooth conduct of all rounds.

4.2 Event Format

Round 1 — MCQ Round

39 of 118 registered students appeared for Round 1. It consisted of multiple-choice questions covering core concepts of C programming — data types, operators, control flow, arrays, pointers, functions, and string handling. All participants sat simultaneously in their assigned laboratories.

Round 2 — Implementation Round

15 students were selected from Round 1; 14 of 15 appeared. Participants solved two coding problems through practical implementation, each carrying 20 marks (total: 40 marks). Problems were designed to assess algorithmic thinking, code correctness, efficiency, and proper use of C syntax. This round was entirely prepared, judged, and evaluated by Prof. Kaushik Sinha.

4.3 Participation Summary by Lab

Lab No.	Venue	Registered	Appeared
W306	Computer Laboratory W306	11	5
Total	6 Labs	118	39

4.4 Results

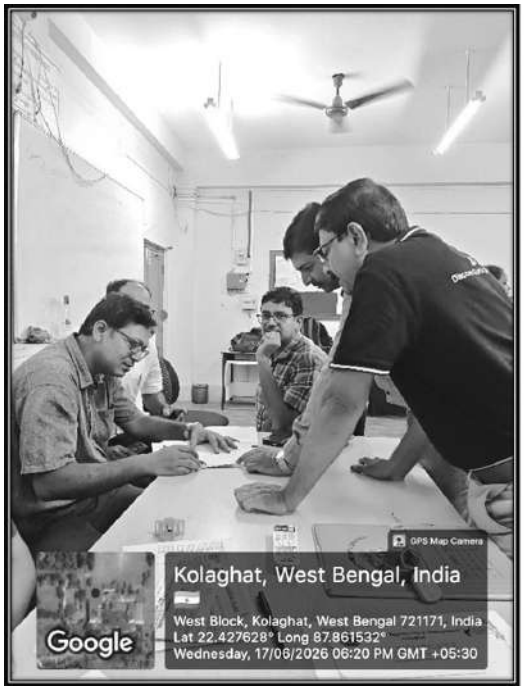
Final standings are based on the combined score from Round 1 (MCQ) and

Round 2 (Implementation). Maximum possible score: 60 marks (20 from MCQ + 40 from Implementation).

C Coding Competition 2K26 — Final Results	
1st	Sreejit Gayen | CSE/25/014 | Score: 37 / 60
2nd	Anish Senapati | AIML/24/020 | Score: 30 / 60
3rd	Md Rashid Iqbal Khan | CSE/25/254 | Score: 20 / 60

4.5 Conclusion

The C Coding Competition 2K26 concluded successfully as the final technical event of the 2025–26 academic year at CEMK. With 118 registered participants spread across 6 laboratories, it stood out as one of the most widely participated individual events of the year. The organising committee congratulates all winners and thanks every participant for their enthusiastic involvement.



Acknowledgements

A. Thanks to the Technical Activities Committee

The Technical Activities Committee (TAC) of CEMK deserves sincere gratitude for their unwavering guidance, institutional support, and active mentorship throughout the academic year. The successful execution of all four flagship events was made possible by their collective vision and dedication.

Sl. No.	Name	Designation
1.	Prof. (Dr.) Deb Kumar Adak	TAC Member
2.	Prof. (Dr.) Indrajit Ghosh	TAC Member
3.	Prof. Debottam Das	TAC Member
4.	Prof. Rinku Khatua	TAC Member
5.	Mr. Biswajit Majumder	TAC Member
6.	Mr. Saradindu Chakraborty	TAC Member

B. Acknowledgement of Student Volunteers

The seamless execution of all TAC events across the academic year 2025–26 would not have been possible without the remarkable contribution of the student volunteer team. These students invested their time, energy, and skills far beyond the classroom — managing documentation, invigilation, technical operations, hosting, and logistics across every event.

Complete List of Student Volunteers — Academic Year 2025–26

Sl. No.	Student Name	Roll No.
1.	Subhrangsu Das	CSE/23/115
2.	Debosmita Samanta	CSE/23/016
3.	Nayana Manna	CSE/23/145
4.	Nelkantha Dey	CSE/23/116
5.	Apabrita Ghosh	CSE/23/110
6.	Madhuchhanda Chakrabarti	CSE/23/053
7.	Sreejan Das	ECE/23/16
8.	Sohima De	ECE/23/14
9.	Aditi Mondal	CSE/23/058
10.	Soumili Parai	CSE/23/026
11.	Visha Shriya	CSE/23/106
12.	Sujata Sarkar	CSE/23/152
13.	Ishika Gupta	CSE/23/151
14.	Amritesh Das	AIML/23/01
15.	Subham Das	AIML/23/35
16.	Dipanjan Manna	AIML/23/24
17.	Reyanka Mukherjee	IT/23/02
18.	Suvajit Mondal	IT/23/37
19.	Soumyadip Basuli	ME/23/15

★ Integral contributors — documentation and backend management across all events.

A Year of Innovation and Inspiration: the Journey of the Institution's Innovation Council (IIC)

Dr. Lipika Datta
Assistant Professor
Department of Computer Science and Engineering
President, Institution's Innovation Council

"Innovation is not just about creating something new- it is about daring to think differently and turning ideas into reality."

The Institution's Innovation Council (IIC) of the College of Engineering and Management Kolaghat has been playing an important role in encouraging students to think creatively, develop innovative ideas, and explore entrepreneurship. Throughout the academic year 2025–26, the council organized a series of enriching activities that empowered students to explore new ideas, acquire practical skills, and develop an innovative mindset. From expert talks and coding boot camps to hackathons and technology celebrations, every event contributed to building a vibrant ecosystem of learning and innovation.

September 2025 - Understanding Real-World Problems

The journey began on *20th September 2025* with an insightful session on *"Achieving Problem-Solution Fit."* Students learned that successful innovations begin with identifying genuine problems and designing practical solutions. The interactive discussions encouraged participants to observe societal challenges through the lens of an innovator.

October 2025 - Inspiration from Successful Innovators

On *18th October 2025,* the *"My Story - Motivational Expert Session"* featured successful innovators and entrepreneurs who shared their inspiring journeys from humble beginnings to remarkable achievements. Their experiences motivated students to pursue their dreams with confidence, resilience, and determination.

November 2025 - Celebrating National Entrepreneurship Day

The IIC celebrated *National Entrepreneurship Day* on *7th November 2025,* emphasizing the importance of entrepreneurial thinking in today's rapidly changing world. Through discussions and awareness activities, students were encouraged to view entrepreneurship as a powerful avenue for creating employment, solving problems, and driving economic growth.

December 2025 - Innovation, Technology, and Sustainability

December was packed with multiple engaging activities.

On *16th December 2025,* the college observed *National Energy Conservation Day,*

promoting awareness about sustainable energy practices and the responsibility of engineers towards environmental conservation.

On *20th December 2025,* students participated in a *"Hands-on Experience in Cutting-edge Technologies"*, gaining practical exposure to emerging technological tools and applications beyond the classroom curriculum.

The same day also witnessed the *"Innovation Showcase: Demo Day/Exhibition/ Presentation of Innovations and Prototypes",* where students and faculties presented their innovative ideas and working models before experts and Innovation Ambassadors. The event provided valuable mentorship opportunities and inspired participants to refine their projects for future development.

January 2026 - Building Technical Excellence

The new year began with a *Student Development Program on Specialized Coding,* conducted from *8th January* to *18th January 2026* for third year students. The intensive program enhanced students' programming skills, logical thinking, and problem-solving abilities, preparing them for competitive coding and industry requirements.

Later, on *28th January 2026,* a webinar on *"Astronomy and Indian Space Programs"* introduced students to the fascinating world of space exploration and highlighted India's remarkable achievements in the field of astronomy and aerospace research.

February 2026 - Exploring Diverse Career Opportunities

On *11th February 2026,* students attended the *"Multi-Sector Career Diversification"* session organized jointly by Department of Electronics and Communication Engineering and IIC.The talk broadened their understanding of career opportunities across various industries and emerging domains. The event encouraged participants to explore emerging industries, interdisciplinary domains, and innovation-driven professions while understanding the skills required excelling in them. Through insightful discussions and expert guidance, students were motivated to broaden their career perspectives, embrace continuous learning, and prepare themselves for diverse and dynamic professional pathways in an evolving global landscape.

Meanwhile, from *10th February* to *25th April 2026,* IIC in association with Department of Computer Science and Engineering organized the *Inter-Department Hackathon V-4,* a long-duration innovation challenge where teams collaborated to identify problems, develop prototypes, and implement creative solutions. The event nurtured teamwork, project management, and critical thinking among participants.

April 2026 - Competing Beyond Campus

On *18th April 2026,* students participated in the *Inter-College Hackathon Competition,* organized by Technical Activities Committee in association with IIC, and competed with talented teams from other colleges. The event provided an excellent platform to showcase

technical expertise, exchange ideas, and gain exposure to innovative approaches adopted by peers from different institutions.

April-May 2026 - Transforming Ideas into Business Ventures

To nurture entrepreneurial thinking among students, the Institution's Innovation Council organized a *Business Plan Competition* during *April-May 2026.* The competition was conducted in two stages to ensure that participants not only develop innovative ideas but also can learn how to present them as viable business opportunities.

In the first stage, students submitted the synopsis of their business plans, outlining the problem they intended to solve, the uniqueness of their solution, market potential, and implementation strategy. The shortlisted teams then advanced to the final round held on *27th May 2026,* where they presented and demonstrated their business models before an expert jury.

The presentations were evaluated by, Mr. Balaram Manna, a successful entrepreneur, who assessed the participants on Strength of idea (clarity and vision), Team credentials, Presentation skills, Sustainabilityand overall impact. Beyond selecting the winners, the judge shared valuable insights and constructive feedback, helping students refine their ideas and understand the practical challenges of entrepreneurship.

The competition served as an inspiring platform for aspiring entrepreneurs to transform their creativity into actionable business concepts and gain firsthand experience in pitching ideas to industry professionals.

May 2026 -Honouring Technological Progress

The academic year concluded with the celebration of *National Technology Day on 11th May2026.* Students showcased presentations on emerging technologies, discussed recent scientific advancements, and reflected on the transformative role of technology in shaping the future. The event reinforced the spirit of continuous learning and innovation among aspiring engineers.

More than Events- A Platform for Growth

Each activity organized by the Institution's Innovation Council was designed not merely as an event but as an opportunity for holistic development. Through these initiatives, students gained practical knowledge, interacted with experts, strengthened technical competencies, developed entrepreneurial thinking, and learned to work effectively in teams.

Participation in IIC activities equips students with skills that extend beyond academics—communication, leadership, innovation, critical thinking, and confidence to transform ideas into impactful solutions.

Join the Innovation Movement

As another exciting year awaits, every student is invited to become part of this journey. Whether your passion lies in technology, entrepreneurship, research, coding, or problem-

solving, the Institution's Innovation Council offers the perfect platform to learn, create, and lead.

Be curious. Be innovative. Be the change-maker. Your next great idea could begin with an IIC activity.

Photo Gallery

Mr. Sabyasachi Mukhopadhyay delivering talk on "Entrepreneurship Development and Motivation"

Presentation on National Entrepreneurship Day

Felicitation of Er. TarakMaji, Senior Manager, WBPDCL on National Energy Conservation Day

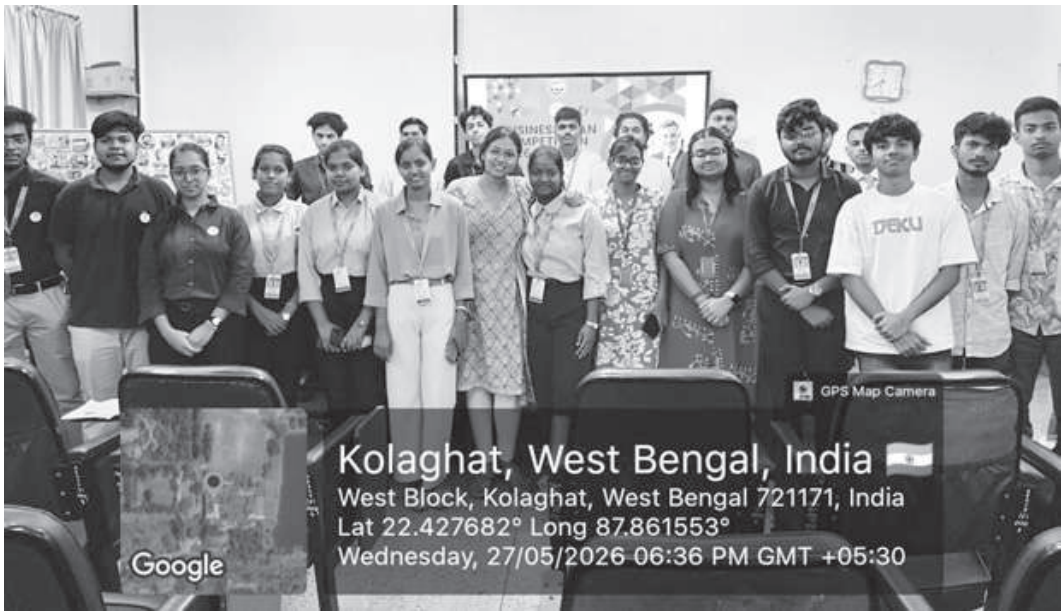
Celebration of National Energy Conservation Day

Special Coding Class for 3rd year students with Mr. Alok Halder, CEO & MD, PCS Global Pvt. Ltd

Talk on Multi-Sector Career Diversification by Mr. Kishan Kumar, Alumnus of 2016 Batch

Demonstration In Inter College Hackathon Winning Team of Inter College Hackathon

Students presenting Business Plan Winning Team of Business Plan Competition



Participants of Business Plan Competition

NCC Programmes & Activities 2025-26

Cadet Santanu Samanta (ECE/23/45)
&
Cadet Mahan Maity(AIML/24/026)

INDEPENDENCE DAY 2025 Dated: 15th August, 2025

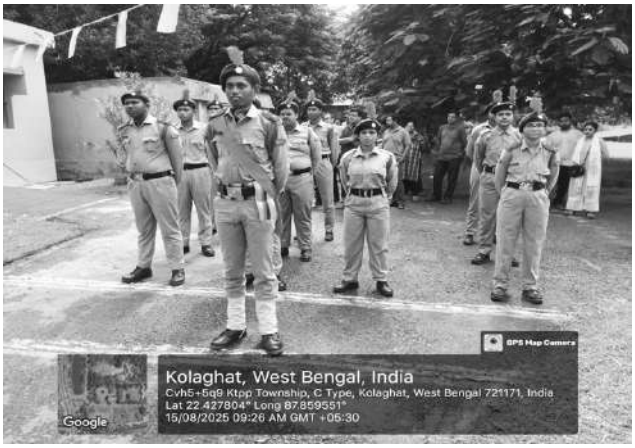
Location: Administrative Building, CEMK

The Independence Day of India was celebrated with great pride and enthusiasm on 15th August 2025 in our college campus under the leadership of the National Cadet Corps (NCC).

The program began in the morning with the hoisting of the National Flag, followed by the singing of the National Anthem. NCC cadets & college students stood in perfect discipline and saluted the flag, creating a patriotic atmosphere across the campus.

After the flag hoisting, a brief parade by the NCC cadets was conducted, showcasing their discipline, unity, and dedication to the nation. Director Sir addressed the gathering and spoke about the importance of Independence Day, the sacrifices of freedom fighters, and the role of youth in nation-building.

Various patriotic speeches and songs were presented by students, which inspired everyone and filled the environment with national spirit. The NCC cadets also took a pledge to serve the nation with honesty and responsibility.



77th REPUBLIC DAY CELEBRATION Dated: January 26, 2026

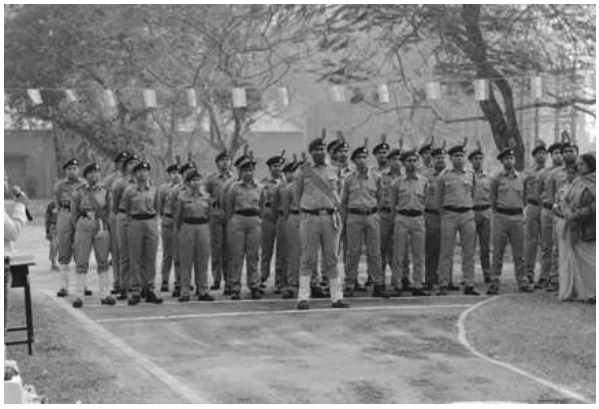
Location: Administrative Building, CEMK

The NCC cadets of College of Engineering and Management, Kolaghat proudly

organized the Republic Day festivities to commemorate the adoption of the Indian Constitution on January 26, 1950. This annual event highlights national pride, discipline, and patriotism, with NCC leading as per their motto "Unity and Discipline."

The program began at 7:30 AM with the arrival of our Chief Guest- Director sir.

Flag Hoisting Ceremony: The event began with the hoisting of the National Flag by the Chief Guest (CEMK Director sir), followed by the singing of the National Anthem. The flag hoisting was a solemn moment that filled everyone with pride and respect for the nation.



Speeches: The event featured inspiring speeches by the Chief Guest Director sir . They emphasized the significance of Republic Day, the importance of the Constitution, and the role of youth in nation-building. The speeches encouraged students to contribute positively to society and uphold the values enshrined in the Constitution.

Distribution of Sweets: To celebrate the occasion, sweets were distributed among the students and faculty members, symbolizing joy and unity. This gesture fostered a sense of community and togetherness.

ANNUAL SPORTS (ATHLEEMA 2026) Dated 28th March, 2026

Venue: College Sports Grounds

The Annual Sports Event, ATHLEEMA 2026, was successfully conducted on 28th March 2026 at the College Grounds, organized by CEMK. The event brought together students, faculty members, and sports enthusiasts to celebrate athletic talent, teamwork, and sportsmanship.

The program commenced with an inaugural ceremony, where the dignitaries lit the ceremonial torch and addressed the gathering, encouraging students to actively participate in sports for physical and mental well-being. This was followed by a march-past by different houses, displaying discipline and unity.

A variety of track and field events were organized, including races such as 100m, 200m, relay races, long jump, high jump, and shot put. Students enthusiastically participated and showcased their skills and competitive spirit. Fun events and games were also arranged to ensure inclusivity and enjoyment for all participants.

The event was marked by high energy, cheering crowds, and a strong sense of camaraderie among students. Volunteers and organizers ensured the smooth execution of all activities, maintaining discipline and safety throughout the day.

DRIVE FOR PLASTIC FREE CAMPUS Dated: 28th March, 2026

Venue: College Campus; Organ0zed by: NCC & Students of NSS

A "Drive for Plastic-Free Campus" was successfully organized on 28th March 2026 at the College Campus by the National Cadet Corps (NCC). The initiative aimed to promote environmental awareness and encourage students to reduce the use of plastic within the campus.

The program began with a brief introduction by the NCC ANO officers, who highlighted the harmful effects of plastic pollution on the environment and human health. Cadets and volunteers actively participated in the drive, spreading awareness among students and staff about the importance of adopting eco-friendly alternatives.

As part of the campaign, participants conducted a cleanliness drive across the campus, collecting plastic waste and ensuring proper disposal. Informative posters and slogans were used to educate everyone about minimizing plastic usage and maintaining a clean and green environment.

BLOOD DONATION CAMP Dated: APRIL 08th April, 2026

Venue: CEMK; Organized by: CEMK (NCC & NSS)

A Blood Donation Camp was successfully organized on April 8, 2026, at the College of Engineering and Management, Kolaghat Campus by the National Cadet Corps (NCC) unit

of CEMK. The event aimed to promote the importance of voluntary blood donation and to contribute to saving lives through this noble cause.

The camp witnessed enthusiastic participation from students, faculty members, and staff. Medical professionals and trained personnel were present to ensure that the donation process was conducted safely and hygienically. Before donating blood, all participants underwent basic health check-ups, including hemoglobin level, blood pressure, and general fitness assessment.

The NCC cadets & NSS Students played a crucial role in organizing and managing the event efficiently. They handled registration, guided donors, and ensured proper coordination throughout the camp. Awareness about the benefits of blood donation and myths related to it was also spread among participants.

The Flynn Effect in Reverse: Why Today's Students May Be Thinking Less Deeply

Dr. Arko Banerjee
Assistant Professor
Department of Basic Science and Humanities

For more than a century, a powerful narrative shaped the field of psychology: humanity was getting smarter. From the early 1900s onward, researchers documented a steady rise in intelligence test scores across industrialized nations—a phenomenon known as the Flynn Effect [1]. Improved education, nutrition, healthcare, and access to information appeared to be building sharper, more capable minds with each generation.

For decades, the trend seemed unshakable. Children consistently outperformed their parents and grandparents on tests of logical reasoning and problem-solving. Human intelligence appeared to be on a permanent upward trajectory.

Recent research, however, has revealed a troubling shift. In many countries, that climb has not only slowed—it has begun to reverse.

A Warning from Neuroscience

In testimony before the United States Senate, neuroscientist Jared Cooney Horvath presented findings that challenge long-held assumptions about cognitive progress [2].

Despite spending more years in formal education than any previous generation, many members of Generation Z are showing declines in several key cognitive domains, including:

- Sustained attention
- Memory retention
- Reading comprehension
- Numerical reasoning
- Complex problem-solving

These observations raise a critical question: if students are studying longer than ever, why are they learning less deeply?

Biology Meets the Digital Environment

To understand this paradox, it is necessary to consider how the human brain learns best. Over thousands of years of evolution, the brain developed mechanisms that favour deep concentration and sustained cognitive effort. Psychologists refer to this as deep processing

—the careful following of ideas, engagement in discussion, and reflective thought that transforms information into meaningful understanding.

Modern digital environments operate on fundamentally different principles. Smart phones, tablets, and social media platforms are intentionally designed to capture and hold attention through constant stimulation. Notifications, infinite scrolling, short-form video, and rapid task-switching encourage brief bursts of attention rather than sustained focus.

In essence, a brain built for deep thinking now functions within an ecosystem engineered for distraction. Attempting to learn complex material while managing digital interruptions has been compared to constructing a building on constantly shifting ground.

Screen Time and Cognitive Shallow

Today 's college students spend an unprecedented portion of their waking hours in front of screens. Smart phones, laptops, tablets, and gaming devices dominate both academic and leisure time. While digital tools offer undeniable advantages—online lectures, educational videos, and interactive simulations can enhance accessibility—researchers increasingly warn that excessive screen exposure may reduce cognitive depth [2].

Studies indicate that reading on digital devices often promotes shallow processing : skimming text quickly rather than absorbing it thoroughly. Hyper links, pop-up notifications, and the temptation to multitask cause the brain to jump between pieces of information before the first idea is fully understood. Over time, this habit weakens the ability to sustain attention for extended periods—a skill essential for mastering content that requires deep analytical effort.

Not a Generational Failure

It is important to clarify that this trend does not reflect a failure of character or effort among students. Young people today are growing up in an environment fundamentally different from that of previous generations. Smart phones are no longer merely tools; they have become entire ecosystems powered by sophisticated algorithms designed to capture and hold our attention.

In his testimony, Dr. Horvath argued that the modern digital environment creates a fundamental mismatch with the brain's natural mechanisms for learning [2]. The human brain evolved in environments that reward patience and sustained focus, yet modern digital systems reward speed, novelty, and constant stimulation. As a result, the brain is increasingly trained to chase quick dopamine hits rather than pursue deep understanding.

The risks extend beyond lower academic scores. Over time, the erosion of attention and deep thinking could weaken broader societal capacities—including innovation (which requires holding complex ideas in mind for extended periods), creativity (which often grows

from boredom and daydreaming), thoughtful debate (which demands patient listening), and meaningful human interaction (which relies on uninterrupted presence).

What International Data Reveal

Global Evidence from PISA 2022 [3]: The Programme for International Student Assessment (PISA)—which tests approximately 7,00,000 15-year-olds across 81 countries and economies—has documented an "unprecedented drop in performance" in its 2022 cycle. Compared to 2018, mean reading scores fell by 10 points, while mathematics scores dropped by nearly 15 points. Several countries experienced even steeper declines: Germany, Iceland, the Netherlands, Norway, and Poland saw math scores fall by 25 points or more. Importantly, the Organisation for Economic Co-operation and Development (OECD) notes that the COVID-19 pandemic explains only part of the decline; mathematics and science scores had already begun falling before 2018, pointing to underlying structural factors. Andreas Schleicher, OECD Director of Education, warned that these factors "are much more likely to be permanent features of our education systems that policymakers should really take seriously." Among the ten lessons the OECD extracted from resilient education systems is the need to "limit the distractions caused by using digital devices in class." These findings provide large-scale, cross-national evidence that cognitive performance—particularly in reading and mathematics—is not merely stagnating but actively declining, reinforcing the concerns raised by neuroscientific and behavioural studies.

Evidence from a Large-Scale Classroom School Data [4]: A 2022 study published in Reading and Writing analysed data from the U.S. National Assessment of Educational Progress (NAEP), representing nearly 3,00,000 4th- and 8th-grade students, to examine how digital tool use in language arts classrooms relates to reading comprehension. After controlling for student, teacher, and school characteristics (including socioeconomic status, disability, English learner status, and classroom behaviour), the researchers found a negative association between daily digital device use and reading comprehension scores. This means that students who spent more time on digital devices in class tended to score lower on reading tests—and the relationship was nearly twice as strong in 4th grade as in 8th grade. Importantly, however, not all digital activities were equal. When teachers used digital tools for authentic reading projects—such as conducting research and synthesizing information—the study found a positive association with comprehension. That is, more project-based digital work was linked to higher reading scores. In contrast, using digital devices for drill-and-practice activities (e.g., vocabulary building, fluency drills) showed a negative association. The authors interpret these findings through the lens of context models: students may unconsciously transfer shallow, distraction-prone habits from leisure screen use to academic digital reading, unless teachers actively structure tasks that

demand deep engagement. This study demonstrates that the negative effects of screen use in classrooms are not inevitable; rather, they depend critically on how digital tools are used instructionally.

Evidence from a Network Meta-Analysis of Digital Reading [5]: A 2026 meta-analysis published in Education and Information Technologies synthesized 56 studies to compare reading comprehension across paper and four digital devices: computers, tablets, e-readers, and smart phones. The authors used network meta-analysis, a technique that allows direct and indirect comparisons among multiple conditions. Overall, paper ranked highest for reading comprehension, followed in order by tablets, e-readers, computers, and smart phones. However, the most critical finding concerned the role of scrolling. When reading on a digital device required scrolling vertically, paper was significantly better for comprehension than any digital device. In contrast, when scrolling was not necessary—because the text fit on one screen or used page-turning (swiping or clicking)—there were no reliable differences between paper and any digital device, and effect sizes were small. The authors interpret these results through cognitive load theory: scrolling adds extraneous cognitive demands (e.g., losing one's place, tracking moving text) that deplete resources available for comprehension. They conclude that not all digital reading is equal; tablets with paginated (non-scrolling) formats may be the best digital alternative to paper. These findings suggest that the design of digital texts—specifically whether they require scrolling—strongly influences learning outcomes.

Evidence from Brain Activity Studies [6]: A 2024 study published in PLoS ONE used electroencephalographic (EEG) measurements to examine how reading medium—paper versus screen—affects semantic processing. Middle school students read informational texts either on a laptop or on paper. Following the reading task, participants were shown individual words and asked to determine whether each word was related to the text they had just read, while researchers recorded their brain activity. The results revealed a significant difference in neural processing. When students read from a screen, their brains processed the words in a relatively shallow manner, consistent with skimming. In contrast, reading on paper prompted deeper, more meaningful processing, as evidenced by stronger neural connections between the text and related concepts. Notably, students per formed equally well on conventional comprehension tests regardless of the reading medium. This finding underscores a critical insight: standard comprehension measures may not capture differences in depth of processing. Even when readers demonstrate adequate understanding after reading digitally, their brains may not engage with the material as deeply as when reading from paper. The study provides direct neural evidence that reading medium influences the depth of semantic processing—a distinction with important implications for study habits and long-term retention.

Evidence from Objective Smart phone Tracking [7]**:** A 2026 study published in JAMA Network Open provides objective, real-time evidence linking smart phone use during school to reduced cognitive control. Researchers tracked the phones of 79 adolescents aged 11 to 18 years every hour over two weeks, generating thousands of data points. They found that students used their smart phones during every hour of the school day, spending an average of 2.2 hours—nearly one-third of the school day—on their devices. Social media and entertainment apps accounted for more than 70% of that time. Critically, the study distinguished between total screen time and the frequency of checking. Students checked their phones an average of 64 times during the school day, ranging from 13 to over 140 times. More frequent checking was associated with significantly poorer performance on a validated measure of cognitive control (inhibitory control), even after controlling for total screen time. Total screen time alone showed no such association. The authors conclude that habitual, frequent phone checking fragments attention and may undermine the self-regulation skills essential for academic success. These findings provide strong empirical support for school policies that limit access to highly reinforcing platforms during instructional hours.

The Modest Impact of Technology [8]**:** This structural mismatch is further illuminated by the educational research of John Hattie, who synthesized over 800 meta-analyses involving more than 50,000 studies on student achievement. Hattie found that the average effect size of computer-assisted instruction—using technology as a primary learning tool—is only 0.31. In his framework, an effect size of 0.40 represents the "hinge point" where an intervention begins to have a meaningful, real-world impact on learning. By comparison, factors that rely on deep human engagement—such as classroom discussion (effect size 0.82), high-quality teacher-to-student feedback (0.73–0.75), and positive teacher-student relationships (0.72)—far exceed this threshold. These findings suggest that even when digital tools are used regularly, their contribution to learning remains modest relative to the power of active dialogue, timely guidance, and genuine human connection.

In summary, the evidence from global assessments, correlational studies, neuro imaging, and meta-analyses consistently points to a real and measurable decline in key cognitive skills. This decline has emerged alongside the spread of digital technologies, and the underlying mechanisms include shallower information processing, fragmented attention, and the poor performance of many digital learning applications when it comes to promoting deep understanding.

Reclaiming Cognitive Focus

Despite these challenges, the future is far from hopeless. Awareness of the problem is a critical first step. For educators, the task lies in using technology deliberately rather than

automatically. Not ever y lesson requires a screen; sometimes the most effective learning tools remain a printed book, a notebook, and a live classroom discussion with a chalk & talk.

For students, adopting mindful habits can produce measurable improvements:

- Keep phones out of reach during dedicated study sessions.
- Read long texts slowly and carefully rather than skimming.
- Take handwritten notes to reinforce memoy through motor and spatial processing.
- Engage in face-to-face discussions with peers and instructors.

These practices strengthen the brain's ability to focus and process information deeply, counteracting the fragmenting effects of digital media.

A Choice for the Future

Technology itself is not an adversary. Digital tools have transformed communication, research, and creativity in extraordinary ways. The real challenge lies in learning to control technology rather than allowing it to control us.

Education has always been about more than acquiring information. It is about cultivating curiosity, patience, reflection, and the ability to think deeply about the world. The digital world competes for attention ever y second. But knowledge, understanding, and wisdom require something far rarer: sustained focus.

In the end, the question is not whether our devices are intelligent. The question is whether we will remain intelligent enough to use them on our own terms.

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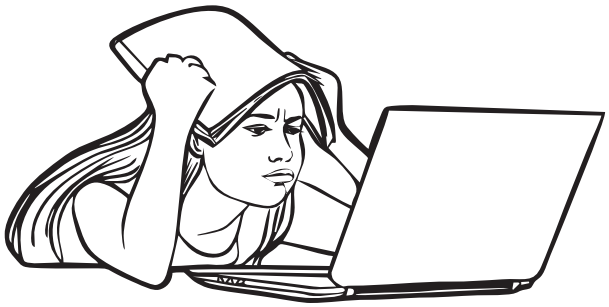

Seven segment display interfacing with 8051 microcontroller

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A 7-segment display is commonly used in electronic display devices for decimal numbers from 0 to 9 and in some cases, basic characters. The use of LEDs in seven-segment displays made it popular, bright and clear, easy to interface and cost effective. There are 7 illuminating segments (named as a, b, c, d, e, f, g) and a dot (named as DP) in a 7-segment display. Corresponding to each segment and dot there is a LED inside the 7-segment display. A particular segment in a 7-segment display becomes illuminated if the corresponding LED of that segment glows due to the forward biasing. The pin-out of a 7-segment display is shown in Fig-1.1.

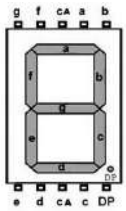

Fig-1.1(a): Pin-out of Common Anode 7-segment display

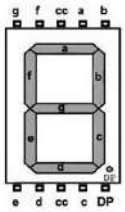

Fig-1.1(b): Pin-out of Common Cathode 7-segment display

Basically there are two types of 7-segment display namely 1) Common Anode 7-segment display and 2) Common Cathode 7-segment display.

1) Common Anode 7-segment display – In this construction all the anodes of eight LEDs are connected together to form a common terminal CA as shown in Fig-20.1(a). Other eight cathode terminals are connected to eight pins namely a, b, c, d, e, f, g and DP. The internal schematic diagram of a common anode 7-segment display is shown in Fig-1.2.

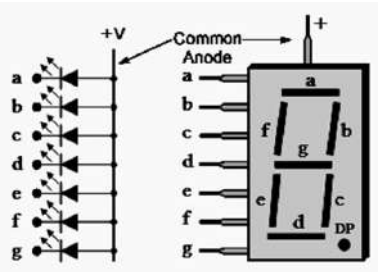

Fig-1.2: Internal schematic diagram of common anode 7-segment display

2) Common Cathode 7-segment display – In this construction all the cathodes of eight LEDs are shorted together to form a common terminal CC as shown in Fig-20.1(b). Other eight anode terminals are connected to eight pins namely a, b, c, d, e, f, g and DP. The internal schematic diagram of a common cathode 7-segment display is shown in Fig-1.3.

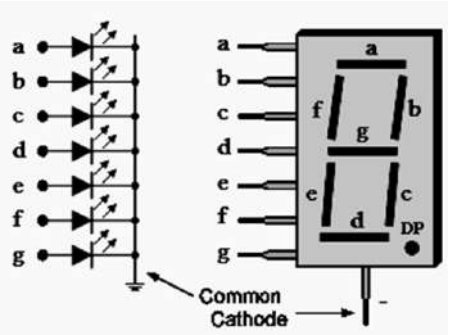

Fig-1.3: Internal schematic diagram of common cathode 7-segment display

Among these two configurations common anode 7 segment display has been used to design the 7 segment display driver board where three 7 segment displays have been used to show any three digit decimal number in the range of 0 to 999. We know that the current rating of any port except Port 0 is around 15 mA in total which is not sufficient to drive the 7 segment display. That's why a driver IC ULN2803 is used to deliver the required current to the 7 segment display to glow it prominently. ULN2803 comprises eight open collector darlington pair transistors inside it. Here each LED of the common anode 7 segment display is connected to the collector of each darlington pair via a current limiting resistance of 220 Ω. If the base of a darlington pair is made high, the darlington pair makes the collector shorted to ground. As a result a current will start to flow through the LED of a particular segment making that segment to be illuminated. Thus any decimal digit in the range of 0 to 9 can be shown on the 7 segment display. Now these three 7 segment displays are driven by a common 8-bit bus with the help of multiplexing using three 74LS373 latches. At any particular time only one latch will be enabled to store the bit pattern to display a digit on a 7 segment display. In this way all of the three 7 segment displays shows the digits one after another, which forms a complete 3 digits number finally. The circuit diagram of the 3 digit 7 segment display driver is shown in Fig-1.4.

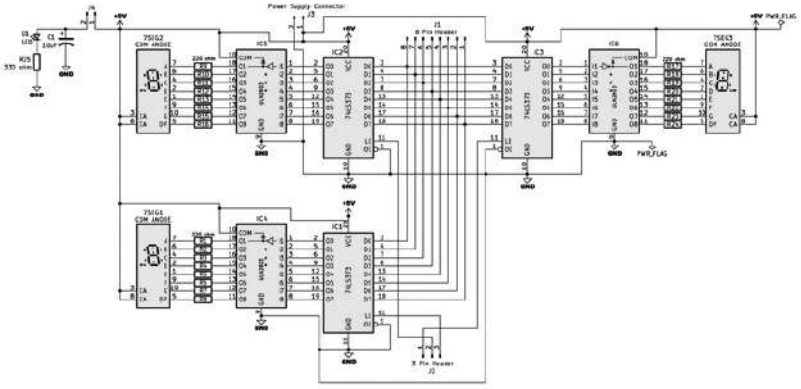

Fig-1.4: Circuit diagram of 3 digit 7 segment display driver

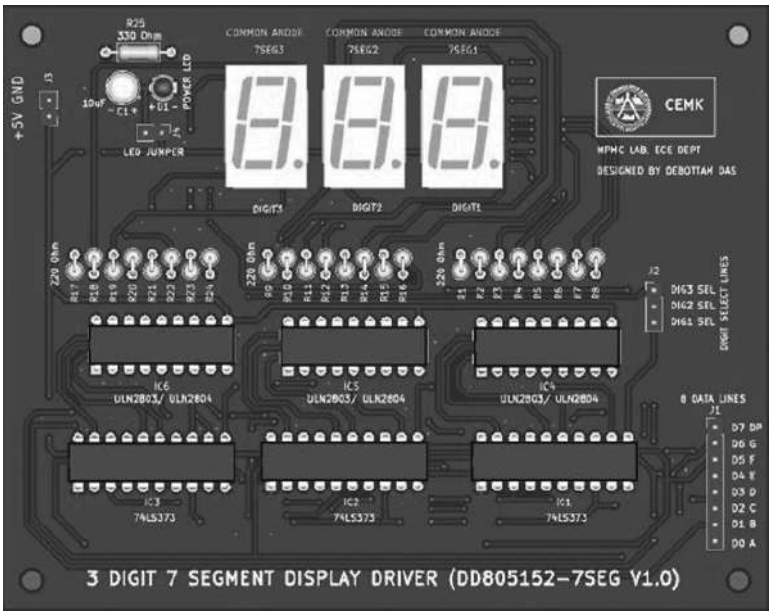

Fig-1.5: Front view of 3 digit 7 segment display driver board

Now this 7 segment display driver can be used for various purposes to implement different programs of 8051.

A Mod-N counter is implemented using 8051 microcontroller and a 3 digit 7 segment display driver where the value of N may be up to 256. We know that a Mod-N counter has N no. of states starting from 0 to (N-1). Therefore the Mod-N counter starts counting from 0 and ends to (N-1) and returns to 0 again to repeat the same counting sequence. Here register R5 is used to count from 0 to (N-1). After every counting 3 digits (Digit1, Digit2 and Digit3) of counting value are extracted from the counting value (packed BCD) stored in

the register R5 and these digits (unpacked BCD) are converted to its equivalent 7 segment codes using a lookup table. Finally these 7 segment codes are sent to the corresponding 7 segment displays one by one to glow the entire 3 digits for representing a counting value. The selection of these 7 segment displays is done using Latch Enable (LE) pin of 74LS373 IC which are connected to P3.0, P3.1 and P3.2 of Port3. Therefore it is clear that Port2 is connected to the common 8-bit data bus of the display driver and 3 pins of Port3 (P3.0, P3.1, P3.2) are connected to LE pins of three 74LS373 ICs. All the 7 segment displays used here is common anode type which are driven by another three driver ICs namely ULN2803. The circuit diagram of 3 digit 7 segment display driver board is shown once again in Fig.1.6 for visualization.

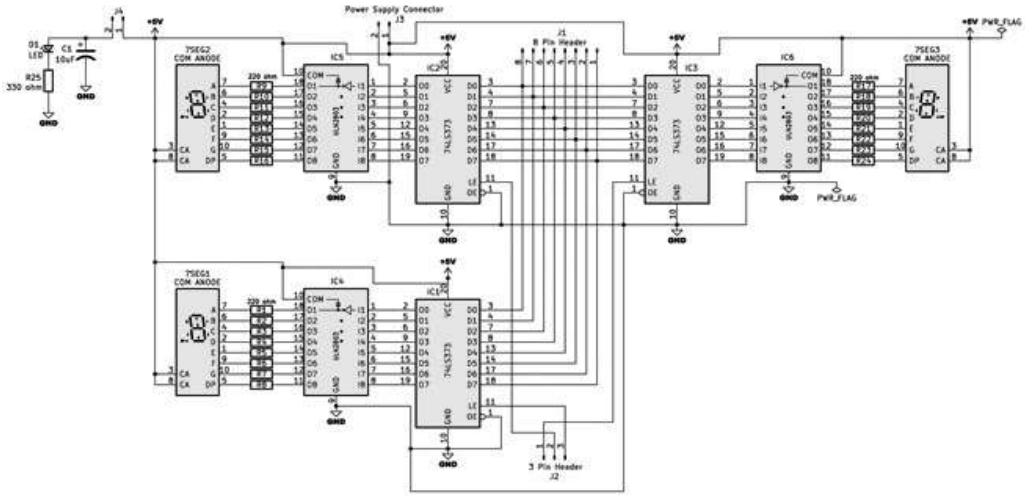

Fig-1.6: Circuit diagram of 3 digit 7 segment display driver

Now 7 segments (a, b, c, d, e, f, g) and DP of every 7 segment display are controlled by the pins of Port2 as follows.

P2.0 → a	P2.1 → b	P2.2 → c	P2.3 → d
P2.4 → e	P2.5 → f	P2.6 → g	P2.7 → DP

Depending upon the above configuration the following table gives the 7 segment codes corresponding each digits and these 7 segment codes are stored in a lookup table starting from the memory address 200 in the code memory of 8051.

P2.7	P2.6	P2.5	P2.4	P2.3	P2.2	P2.1	P2.0	Code in Hex	Memory Addresses to store the 7 segment codes	Displayed Single Digit Number
DP	g	f	e	d	c	b	a			
0	0	1	1	1	1	1	1	3F	200	0

0	0	0	0	0	1	1	0	06	201	1
0	1	0	1	1	0	1	1	5B	202	2
0	1	0	0	1	1	1	1	4F	203	3
0	1	1	0	0	1	1	0	66	204	4
0	1	1	0	1	1	0	1	6D	205	5
0	1	1	1	1	1	0	1	7D	206	6
0	0	0	0	0	1	1	1	07	207	7
0	1	1	1	1	1	1	1	7F	208	8
0	1	1	0	1	1	1	1	6F	209	9

If 254 is to be displayed on the 7 segment display driver, the 7 segment code of 4 (LSD) i.e. 66H will be sent to the data bus via Port2 first, then P3.0 is made high keeping P3.1 and P3.2 low to select Digit1 so that the 7 segment code 66H reaches only to Digit1 to glow 4 on it. Other two digits 5 and 2 (MSD) are also shown on Digit2 and Digit3 respectively maintaining the above mentioned sequences and enabling P3.1 and P3.2 respectively. Thus the entire counting value 254 will be shown on 3 7 segment displays finally. In this program a delay of 1 sec approximately is maintained between two consecutive counting values. The assembly language program for Mod-N counter is given below.

Assembly Language Program 20.1:

SL.	Label	Instructions of 8051
1		ORG 0000H
2		N EQU 256
3		T EQU 10
4		MOV P3, #00H
5		MOV DPTR, #200
6	START:	MOV R1, #N
7		MOV R5, #00H
8	BACK:	ACALL CONVT
9		ACALL DELAY
10		INC R5
11		DJNZ R1, BACK
12		SJMP START
13		
14	CONVT:	MOV B, #100
15		MOV A, R5
16		DIV AB

SL.	Label	Instructions of 8051
17		MOVC A, @A+DPTR
18		MOV P2, A
19		NOP
20		NOP
21		NOP
22		NOP
23		SETB P3.1
24		NOP
25		NOP
26		NOP
27		NOP
28		CLR P3.1
29		MOV A, B
30		MOV B, #10
31		DIV AB
32		MOVC A, @A+DPTR
33		MOV P2, A
34		NOP
35		NOP
36		NOP
37		NOP
38		SETB P3.2
39		NOP
40		NOP
41		NOP
42		NOP
43		CLR P3.2
44		MOV A, B
45		MOVC A, @A+DPTR
46		MOV P2, A
47		NOP
48		NOP
49		NOP
50		NOP
51		SETB P3.0

SL.	Label	Instructions of 8051
52		NOP
53		NOP
54		NOP
55		NOP
56		CLR P3.0
57		RET
58	DELAY:	MOV R2, #T
59	L2:	MOV R3, #255
60	L3:	MOV R4, #255
61	L4:	DJNZ R4, L4
62		DJNZ R3, L3
63		DJNZ R2, L2
64		RET
65		
66		ORG 200 //Lookup table starts from 200 memory address
67		DB 3FH, 06H, 5BH, 4FH, 66H, 6DH, 7DH, 07H, 7FH, 6FH
68		END

Mathematical Models for Score Prediction

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Cricket is a data-intensive sport, where the outcome of a match often hinges on how runs are scored and wickets are lost over time. In recent years, cricket analytics has moved beyond simple run-rate calculations and expert intuition to mathematical and machine-learning models that can estimate not only the final score but also the win probability in real time. This write-up introduces a set of progressively simpler mathematical models for score prediction, starting from naive run-rate extrapolation and wicket-adjusted projections, through Duckworth–Lewis–Stern resource-scaling and dynamic "next-ball" expected-runs models, to player-level expected-runs and machine-learning regression techniques such as Random Forest. Finally, a simple win-probability model is presented to show how the current match state can be translated into a quantitative estimate of who is more likely to win. Together, these models form a compact toolkit for a basic-level understanding of AI/ML-based cricket score prediction and can serve as a basis for further computational experiments or small research projects.

1. **<u>Basic projected score (run-rate extrapolation)</u>**

Let the current score be S, the overs completed o, and the overs remaining $O-o$, where O is the total allotted overs (20 for T20, 50 for ODI).

Define the current run-rate as: $r = \frac{S}{o}$

Then, a naive projected score assuming the run-rate stays constant is: $\widehat{T} = S + r.(O - o)$

Example:-

- In an IPL match, after 12 overs, MI scored 84/2.
- The current run-rate r=84/12=7.
- Remaining overs: 20−12=8.
- Projected score: $\widehat{T}$=84+7×8=140.

This can be used as a baseline before adding ML corrections.

2. **Wicket- and run-rate-adjusted projected score**

A slightly better formula includes wickets in hand w. Let W_{max} be the maximum wickets (10), and define a wicket factor: $\alpha(w) = 1 + \beta\left(\frac{W_{max} - w}{W_{max}}\right)$. where β is a small positive constant (e.g., 0.2–0.3) tuned from historical data. Then the adjusted projected score is: $\widehat{T}_{adj} = S + \alpha(w).r.(O - o)$.

Interpretation:

- If several wickets are already down (w small), $\alpha(w)<1$ (slower finishing).
- If many wickets are in hand (w large), $\alpha(w)>1$(expect more aggressive finishing).

Example:-

$S = 84,\ r = 7,\ O - o = 8,\ w = 8\ and\ let\ \beta = 0.2,$

So the wicket factor: $\alpha(W) = 1 + \beta\left(\frac{W_{max} - w}{W_{max}}\right) = 1 + 0.2\left(\frac{10-8}{10}\right) = 1.04.$

The projected score: $\widehat{T}_{adj} = S + \alpha(w).r.(O - o) = 84 + 1.04\times7\times8 = 142.24$.

So, wicket-adjusted projected total ≈ is 142 runs.

3. **Duckworth–Lewis–Stern (DLS) Resource-Scaling**

In rain-affected matches, the Duckworth–Lewis–Stern method treats a team's options as a resource composed of overs and wickets. Let:

- R_1 = percentage of resources available to Team 1,
- R_2 = percentage of resources available to Team 2.

Then the par score for Team 2 is: $Par\ score = S \times \frac{R_2}{R_1}$.

If $R_2 \leq R_1$, the target to win is: Target=[Par score].

If $R_2 > R_1$, many DLS implementations add a term based on the average 50-over score

G_{50} , (e.g., G_{50}≈245): $Par\ score = S + G_{50} \times \frac{R_2 - R_1}{100} \Rightarrow Target = [Par\ score]$.

Thus, DLS is a simple mathematical scaling of the original score by the ratio of remaining resources.

Simple Example Match setup (ODI):

- Team 1: Scores 254 runs in 50 overs without interruption, so they used 100% resources and

  $_1$=100%.

- Team 2 starts their chase, but rain stops play early, and they are allotted only 45 overs instead of 50.

From the DLS table (Standard Edition), with 5 overs lost at the start, Team 2 has $_2$=90% of resources available.

Step-by-step DLS calculation:

Par score (reduced target for Team 2): $= \times \frac{2}{1} = 254 + \frac{90}{100} = 228.6 \approx 229$

.

So, after the rain, Team 2 must score 229 runs in 45 overs to win, and 228 runs to tie.

4. <u>Expected runs using a dynamic "next-ball" model</u>

Some advanced score-prediction systems use a dynamic value function (,), which is the expected additional runs when *b* balls have been bowled and *w* wickets are lost so far. The recurrence is:

$$(.) = (,) + (,) (+ 1, + 1) + (1 - (,)) (+ 1,).$$

where:

- $r(b,w)$ = expected runs on the next ball in state (b,w),
- $p(b,w)$ = probability of a wicket on the next ball in the state (b,w).

The predicted total score at that stage is: $(,) = (,) + (,)$, where $S(b,w)$ is the current score after *b* balls and *w* wickets.

<u>Example- Match state (T20)</u>:

- 10 overs completed → balls bowled so far = 60, balls remaining = 60.
- Current score = 80 runs, wickets lost = 2 (8 in hand).
- Suppose, from historical data, we know:
  - Expected runs on the next ball in this state: $r(60,2)=1.2$.
  - Wicket probability on the next ball: $p(60,2)=0.05$ (5%).

Assume, for simplification, that further ahead, the terminal value $V(120,w)=0$ (no overs left).

Step-by-step (one-step backward-style):

1. Value at 10 overs (60 balls, 2 wickets lost):

$$V(60.2) = r(60.2) + p(60.2)\,V(61,3) + (1 - p(60,2))V(61,2) \approx 80.$$

For this example, instead of solving the full recursion, assume that the expected future runs from the remaining 60 balls with 2 wickets down is roughly 80, based on historical averages.

2. Then the predicted total innings score is:

$$\widehat{T}\,(60,2) = S(60,2) + V(60,2) = 80 + 80 = 160\,.$$

At 10 overs with the score at 80/2, a dynamic 'next-ball' model might estimate that 80 more runs will be scored from the remaining 60 balls, leading to a projected total of 160. This approach is more realistic than simple run-rate extrapolation because it utilizes state-dependent probabilities for both runs and wickets.

5. **<u>Player-level expected-runs (xR-style)</u>** For batter-specific analysis, define the expected runs per ball faced xR for a given batter in a given context (e.g., powerplay vs death):

$$xR(batter, context) = \frac{total\ runs\ scored\ by\ batter\ in\ that\ context}{total\ balls\ faced\ in\ the\ context}\,.$$

Then, if a batter faces n more balls in that context, the expected contribution is:

$$\widehat{R}_{batter} = xR(batter, context) \times n.$$

Example:

- Virat Kohli in T20 powerplay: historical xR = 1.2 runs per ball.
- If he faces 20 more balls in power play, expected contribution: $\widehat{R}_{Kohli} \approx 24$

This can be aggregated over the batting order to estimate the total innings score.

6. **<u>Machine-Learning Regression Models</u>**

In cricket score prediction, machine-learning regression models learn a function from historical data that maps the current match state (such as balls remaining, runs scored, and wickets lost) to a predicted final score.

The model inputs (features):

- How many runs are scored so far (S),

- How many balls are left (b),
- How many wickets in hand (w),
- Run-rate, venue, team names, etc.

Then the Random Forest prediction is: $\widehat{T} = \frac{1}{T}\sum_{t=1}^{T} \widehat{T}_t (S, b, w, ...)$.

where:

- T = number of trees,
- $\widehat{T}_t$ = predicted final score from tree

Each tree "thinks differently," so the ensemble is more robust than a single tree or a single line.

Example (IPL 10-over state):

- State: 80 runs, 10 overs done, 8 wickets in hand, Eden Gardens, strong batting.
- Suppose 3 trees predict: 175, 160, 145.
- Random Forest prediction: $\widehat{T}_t = \frac{175 + 160 + 145}{3} = 160$.

So, ML-based projected a total of 160 runs (more data-driven than simple run-rate).

7. **<u>Win-probability from current score</u>**

For limited-overs cricket, you can model the win probability of the chasing team as a function of resource balance. Let:

- $R_{used} = \frac{b_{bowled}}{b_{total}}$, (fraction of balls used).
- $R_{runs} = \frac{S_{chased}}{S_{targetl}}$, (fraction of runs scored so far).

Then a rough win-probability function can be: $P_{win}(b, w) = \sigma(\gamma(R_{runs} - \rho R_{used})) = \sigma(z)$.

where:

- $\sigma(z) = \frac{1}{1 + e^{-z}}$ is the sigmoid (logistic) function $z = \gamma(R_{runs} - \rho R_{used})$.
- γ, ρ are parameters fitted from historical data (e.g., via logistic regression).

This is a simple way to write a data-driven win-probability model for a paper section on "in-play prediction".

Example:- Chase in T20 / IPL-style:

- Target: 180 runs.

- After 14 overs, the chasing team has scored 126 runs for 4 wickets lost.
- Balls remaining: 36.
- Runs needed: 180−126=54 in 36 balls.

Step-by-step win-probability model (simple logistic-style):

Define: a) fraction of balls used $R_{used} = \frac{b_{bowled}}{b_{total}} = \frac{84}{120} = 0.7.$

b) fraction of runs scored so far $R_{runs} = \frac{S_{chased}}{S_{targetl}} = \frac{126}{180} = 0.7.$

c) Suppose fitted values: γ=10, ρ=1. Then: $z = 10 \times (0.7 - 1 \times 0.7) = 0.$

d) Win probability: $\sigma(z) = \frac{1}{1+e^{-z}} = \frac{1}{1+e^{0}} = 0.5.$

Since the team is exactly on the required rate (70% of runs from 70% of balls), the model gives a 50% win probability. If they were ahead of the required rate, $R_{runs} > \rho R_{used}$, the probability would be above 0.5; if behind, it would be below 0.5.

This section covered different math models for predicting cricket scores. We started with simple methods like basic run-rate formulas. Then, we looked at advanced data methods, including the Duckworth-Lewis-Stern (DLS) system, next-ball models, and machine learning. Through easy IPL examples, we showed how each new model improves on the last one by adding key details like wickets and player skills. Finally, we showed how these same ideas can predict which team will win a run chase.

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Symmetry of Nature & Physics : A Philosophical Aspect

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Nature shows a deep sense of balance and harmony, and this balance is called symmetry. In simple terms, symmetry means that something remains unchanged even when it is viewed from different positions or under certain transformations. In physics, symmetry helps us understand the laws of nature and the behavior of matter and energy. At the same time, it also has a philosophical meaning, because it reveals the order and beauty present in the universe.

Symmetry in Nature

In everyday life we often see that many things in nature occur in pairs or complementary forms. One simple example is the existence of man and woman, representing the male–female principle. This pairing shows that nature often works through balance between opposite or complementary elements. Similar ideas can also be seen in physics. Many physical phenomena occur in pairs or follow symmetrical rules. This suggests that the universe follows certain patterns of balance and harmony.

Symmetry in Electromagnetism

Let us consider a simple physical example. Suppose we have a conducting loop. If we create a voltage difference between two points of the loop, an electric current flows through it. According to modern physics, electric current produces a magnetic field around the conductor. Now if we think about symmetry in nature, we may expect the reverse process to also occur. That means if electricity can create magnetism, then magnetism should also be able to produce electricity. This idea was confirmed by the experiments of Michael Faraday. He discovered that when the magnetic field around a coil changes, an electric current is produced in the coil. This phenomenon is known as electromagnetic induction. This law shows the beautiful symmetry between electricity and magnetism.

Similarity Between the Large and the Small World

The idea of symmetry can also be seen in the relationship between the large universe (macrocosm) and the small atomic world (microcosm). Many scientists and philosophers believed that both follow similar principles. A famous example is the comparison between the solar system and the atom. In early atomic models, electrons were imagined to revolve around the nucleus in the same way that planets revolve around the Sun. Although modern

physics later improved this model, the idea helped scientists understand atomic structure in the early days. This example shows that similar patterns may appear at different scales of nature.

Quantum Theory and Symmetry

At the beginning of the twentieth century, scientists faced a serious problem while studying black body radiation. Classical physics predicted that radiation should be emitted continuously, but experiments did not agree with this prediction. To solve this problem, Max Planck proposed a revolutionary idea. He suggested that energy is emitted or absorbed in small packets called quanta, rather than continuously. Later, Albert Einstein used this idea to explain the photoelectric effect. Einstein proposed that light behaves as particles called photons. This discovery showed that light has both wave-like and particle-like properties. From the symmetry point of view, if light (which was thought to be a wave) can behave like a particle, then particles might also behave like waves. This idea was proposed by Louis de Broglie, who suggested that particles such as electrons have wave properties. His theory was later confirmed experimentally by Clinton Davisson and Lester Germer, and also by George Paget Thomson through electron diffraction experiments. From these discoveries a new branch of physics called quantum mechanics developed. Interestingly, de Broglie's idea came partly from his philosophical belief in the symmetry of nature.

Symmetry and Antimatter

Another remarkable example of symmetry in physics came from the work of Paul Dirac. While studying the relativistic equation for electrons, Dirac found that his mathematical solution predicted the existence of another particle similar to the electron but with opposite charge. He suggested the existence of an anti-electron, which was later called the positron. This prediction was confirmed experimentally by Carl Anderson while studying cosmic rays. Particles and antiparticles form complementary pairs. When a particle meets its antiparticle, they destroy each other and release a large amount of energy. This process is called annihilation. This discovery suggested that antimatter may also exist in the universe, leading to the fascinating idea of an anti-world made of antimatter.

Symmetry and Observation in Physics

Physics also connects with philosophy when we study how we observe particles. For example, to observe an electron we must use light. However, the wavelength of the light affects the accuracy of the measurement. To measure the position of an electron very precisely, we need light of extremely small wavelength. But such light has high energy and disturbs the electron's motion. This leads to the uncertainty principle, proposed by Werner Heisenberg. According to this principle, certain pairs of physical quantities, such

as position and momentum, cannot both be measured exactly at the same time. These pairs are called canonical conjugate pairs. This idea shows a philosophical truth: the way we observe something affects the result of our observation.

Symmetry and Conservation Laws

The connection between symmetry and conservation laws was discovered by Emmy Noether. Her famous theorem states that every symmetry in nature corresponds to a conservation law.

For example:

- symmetry in time leads to conservation of energy
- symmetry in space leads to conservation of momentum
- rotational symmetry leads to conservation of angular momentum.

This discovery showed that the stability of the universe is closely related to the symmetrical nature of physical laws.

Broken Symmetry and Beauty in Nature

Although symmetry is associated with beauty and order, sometimes a slight break in symmetry can make something even more attractive. For example, a small beauty spot on the face may enhance its beauty. In physics, a similar concept exists. A famous example is parity violation, where certain processes in weak nuclear interactions do not follow perfect symmetry. This shows that nature may sometimes break symmetry slightly in order to create variety and complexity.

Conclusion

Symmetry is one of the most important ideas in physics. It helps scientists understand the laws of nature, the behavior of particles, and the structure of the universe. From electromagnetic induction and quantum theory to antimatter and conservation laws, many important discoveries in physics have come from studying symmetry. At the same time, small breaks in symmetry give rise to diversity and beauty in nature. Thus the universe shows a delicate balance between symmetry and asymmetry. When we think about these ideas, we realize that nature is full of mystery and beauty. The human mind can only try to understand this wonderful harmony of the universe through science, philosophy, and thoughtful reflection.

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For when we go out in love beyond and above all things, and die to all observation in ignorance and in darkness, then we are wrought and transformed through the Eternal Word, Who is the Image of the Father. In this idleness of our spirit, we receive the Incomprehensible Light, which enwraps us and penetrates us, as the air is penetrated by the light of the sun. And this Light is nothing else than a fathomless staring and seeing. What we are, that we behold; and what we behold, that we are: for our thought, our life, and our being are uplifted in simplicity, and made one with the Truth which is God. And therefore in this simple staring we are one life and one spirit with God.

-Ruysbroeck

NEP 2020: A Paradigm Shift in the Educational System of Viksit Bharat

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Education is one of the most powerful forces that shapes the destiny of a nation. It influences the way people think, understand society, develop skills, make decisions and contribute to the progress of their communities. For a country as diverse and historically rich as Bharat, education has an even wider responsibility. It must preserve the nation's intellectual and cultural heritage while preparing its younger generation to respond confidently to the scientific, technological, economic and social challenges of the modern world. In this context, the National Education Policy (NEP) 2020 represents a major milestone in the evolution of India's educational system. More than a change in curriculum or examination methods, it attempts to redefine the purpose, structure and philosophy: of education.

The National Education Policy 2020 was approved by the Government of India on 29 July 2020. It replaced the National Policy on Education of 1986 and introduced a comprehensive

framework covering education from early childhood to higher education. Its vision is built around access, equity, quality, affordability and accountability. However, the significance of NEP 2020 extends well beyond these principles. At its core, the policy seeks to create an educational system in which learners are encouraged to understand rather than merely memorize, to explore rather than simply receive information, and to apply knowledge rather than restrict themselves to examination-oriented learning.

The educational traditions of Bharat have historically viewed learning as a means of developing the individual as a whole. Knowledge was traditionally associated with character, discipline, social responsibility, intellectual inquiry and ethical conduct. Although the historical educational systems of India cannot simply be transferred to the modern world, their emphasis on the relationship between knowledge and human development remains relevant. NEP 2020 attempts to reconnect education with some of these broader principles while simultaneously incorporating modern science, technology, innovation and global knowledge.

One of the most important features of the policy is its emphasis on holistic development. A successful student cannot be defined only by examination marks or academic qualifications. Intellectual ability must be accompanied by creativity, communication, emotional maturity, physical well-being, ethical awareness and social responsibility. Modern problems are also becoming increasingly complex. Issues such as climate change, artificial intelligence, cybersecurity, public health, environmental degradation and sustainable development cannot be addressed through knowledge from a single discipline. They require individuals who can combine ideas, communicate effectively and work with people from different backgrounds. NEP 2020 therefore seeks to develop learners who are capable of thinking independently and responding creatively to unfamiliar situations.

A significant structural reform under NEP 2020 is the introduction of the 5+3+3+4 curricular and pedagogical structure. The earlier 10+2 arrangement is replaced by four stages that correspond more closely to the developmental characteristics of children. The Foundational Stage consists of five years, including three years of preschool or Anganwadi education and Classes I and II. This is followed by the Preparatory Stage covering Classes III to V, the Middle Stage covering Classes VI to VIII, and the Secondary Stage covering Classes IX to XII. The inclusion of early childhood education within the formal educational framework is particularly important because the foundation of cognitive, linguistic and social development is established during the early years of life.

Alongside structural reform, NEP 2020 gives special importance to foundational literacy and numeracy. A child who cannot read with understanding, communicate effectively or perform basic mathematical operations is likely to experience difficulties in subsequent education. Ensuring that children acquire these fundamental abilities at an

early stage is therefore essential for reducing educational inequality. The policy's emphasis on foundational learning reflects the understanding that advanced education cannot be meaningful unless the basic foundations are strong.

Another major change proposed by NEP 2020 is the movement away from rote learning towards competency-based education. For a long time, academic achievement in India has often been closely associated with the ability to remember and reproduce large amounts of information. While memory has an important role in learning, education becomes more meaningful when students can understand concepts, apply them in unfamiliar situations, analyse information, solve problems and develop new ideas.

The role of assessment consequently needs to change. Examinations should not become the sole measure of a student's intellectual ability. Continuous and formative assessment can provide teachers with information about what students understand and where they require additional support. Competency-oriented evaluation can also encourage learners to focus on actual understanding rather than simply preparing for a particular examination. In this approach, the important question is not merely how much a student remembers, but what the student can understand, apply, analyse, create and communicate.

The policy also seeks to transform higher education by promoting flexibility and multidisciplinary learning. The conventional division between academic disciplines can sometimes restrict students from exploring areas beyond their principal field of study. NEP 2020 encourages institutions to develop multidisciplinary academic environments where students can combine knowledge from different areas according to their interests and aspirations.

This approach is particularly relevant in the contemporary world. A technological innovation may require engineering knowledge as well as economics, management, social science, ethics and public policy. Similarly, solving environmental problems may require contributions from scientists, engineers, economists, policymakers and social researchers. Multidisciplinary education can therefore prepare students to understand problems in a more comprehensive manner.

Greater flexibility in higher education is also reflected in the concept of multiple entry and exit. The Academic Bank of Credits is intended to support the accumulation and transfer of academic credits, thereby providing learners with greater flexibility in their educational journey. Such mechanisms can be particularly useful for students whose educational paths are interrupted because of employment, financial circumstances, family responsibilities or other reasons.

NEP 2020 also recognizes that education should not create a hierarchy between academic knowledge and practical skills. Vocational education and skill development are

therefore given greater importance. In a developing economy, the contribution of skilled technicians, craftsmen, entrepreneurs, agricultural professionals, healthcare workers and other skilled personnel is indispensable. Integrating vocational exposure with mainstream education can help students understand the practical value of knowledge and may also improve employability.

Equally important is the need to change the social perception of vocational education. Skill-based occupations should not be considered inferior to conventional academic careers. Every form of productive and socially valuable work deserves dignity. By connecting education with practical skills, entrepreneurship and employment, NEP 2020 has the potential to create a more balanced relationship between academic learning and the world of work.

Another distinctive dimension of the policy is its attention to Indian languages and knowledge traditions. Language is closely connected with identity, culture, history and intellectual development. The policy encourages the use of the mother tongue or regional language, particularly during the early stages of education, while also supporting multilingualism.

Bharat possesses a long intellectual tradition that includes contributions to mathematics, astronomy, medicine, philosophy, linguistics, metallurgy, agriculture, architecture, literature and the arts. Introducing learners to these traditions can strengthen their understanding of India's intellectual heritage. At the same time, such knowledge should be examined through evidence, scholarship and critical reasoning. Respect for Indian knowledge systems should complement, rather than replace, modern scientific inquiry. The objective should be to create learners who can appreciate their heritage while remaining intellectually open to knowledge from every part of the world.

Technology forms another important component of the educational transformation envisioned by NEP 2020. Digital platforms, online resources, virtual laboratories, simulations, artificial intelligence and technology-supported assessment can significantly expand educational opportunities. Technology can help connect learners with resources and expertise that may not be available locally.

However, technological development also presents a serious challenge. Not every student has equal access to devices, reliable internet connectivity, electricity or digital learning environments. If these inequalities are ignored, technology could unintentionally increase the gap between privileged and disadvantaged learners. Therefore, digital education must be accompanied by efforts to ensure affordability, connectivity and digital literacy. Technology should strengthen the educational process and the teacher-student relationship rather than replace the human dimension of education.

NEP 2020 also places considerable importance on research, innovation and entrepreneurship. A nation aspiring to become a knowledge-based economy must possess a strong research culture. Universities and colleges should not function only as centres for delivering degrees; they should also become places where new knowledge is generated and practical solutions are developed.

The proposed National Research Foundation reflects the broader objective of strengthening the research ecosystem. Higher education institutions can contribute to national development through laboratories, research centres, innovation hubs, incubation facilities, start-up activities and collaboration with industry. For engineering and technical institutions, this creates opportunities to connect classroom knowledge with real-world problems and technological innovation.

Teachers remain central to all these changes. No policy can transform education unless teachers are adequately prepared and supported. NEP 2020 therefore emphasizes teacher education and continuous professional development. The teacher of the future cannot remain only a transmitter of textbook information. The teacher must increasingly act as a facilitator, mentor, guide and creator of meaningful learning experiences.

This change requires teachers to develop familiarity with new technologies, assessment methods, interdisciplinary approaches and learner-centred pedagogies. Professional development must consequently become a continuous process. Institutions should provide teachers with the necessary resources, training, academic freedom and supportive working environments.

An equally important objective of NEP 2020 is equity and inclusion. The quality of an education system should not be judged only by the achievements of its best institutions. It must also be judged by the opportunities available to students who face economic, geographical, social or physical barriers.

Learners from rural areas, economically weaker sections and other underserved communities may require additional academic, financial and technological support. Students with disabilities also require accessible infrastructure, assistive technologies and appropriately trained teachers. Gender-sensitive and safe educational environments are equally important.

In this respect, NEP 2020 connects educational reform with the broader objective of social justice. An educational system can truly be called successful only when quality education is accessible to a wide section of society rather than being concentrated among those who already possess economic and social advantages.

The idea of Bharat in the context of NEP 2020 can therefore be understood through the relationship between cultural rootedness and global competence. The objective is not to

isolate Indian education from international knowledge. Rather, learners should understand their own heritage while acquiring the skills necessary to participate in the global academic, scientific, technological and professional community.

A young Indian should be able to appreciate the country's languages, traditions, intellectual achievements and constitutional values while simultaneously engaging with global science, technology and innovation. Such a balance can create individuals who are confident about their roots without becoming disconnected from the wider world.

The implementation of NEP 2020, however, will not be without difficulties. India's education system is enormous and highly diverse. Schools and higher education institutions vary greatly in terms of infrastructure, funding, faculty availability, technology and administrative capacity. A reform that is easily implemented in a well-equipped urban institution may require very different arrangements in a rural or resource-constrained institution.

Teacher preparedness is another major issue. New curricula and pedagogical approaches cannot become effective merely because they are included in policy documents. Teachers require training, time, resources and institutional support. Similarly, multidisciplinary education requires changes in academic regulations, credit structures, examination systems, timetables, faculty responsibilities and student support services.

The digital transformation of education presents its own challenges. Unless connectivity and access to digital devices improve, the benefits of technology may remain concentrated among certain sections of society. Implementation also requires sustained cooperation among governments, regulatory bodies, educational institutions, teachers, students, parents and other stakeholders.

Despite these challenges, NEP 2020 represents a significant change in the way education is conceptualized. Its fundamental direction can be understood as a movement from memorization towards understanding, from rigid disciplines towards multidisciplinary learning, from examination orientation towards competency development, from passive learning towards experiential engagement, from degree accumulation towards capability building, and from cultural disconnection towards rootedness combined with global competence.

This is why NEP 2020 can be regarded as a paradigm shift rather than simply another educational policy. Its ambition is to change not only what students learn but also how they learn and why they learn.

The real measure of its success, however, will be visible only through implementation. Policy statements must ultimately translate into better classrooms, better teachers, stronger research institutions, greater access, improved learning outcomes and meaningful

opportunities for students. The transformation will require patience because educational systems cannot be rebuilt overnight. It will also require continuous evaluation so that successful practices can be strengthened and shortcomings can be corrected.

In conclusion, NEP 2020 presents a broad and forward-looking vision for the educational system of Bharat. It recognizes that the education of the future must combine knowledge with skills, technology with human values, Indian heritage with global awareness, academic learning with practical experience, and individual achievement with social responsibility.

Its ultimate purpose is not merely to produce students who can pass examinations or obtain degrees. It seeks to nurture individuals who can think independently, innovate, communicate, collaborate, respect diversity, appreciate their cultural heritage and contribute responsibly to society.

If implemented with adequate resources, institutional commitment, teacher empowerment and sensitivity towards India's diversity, NEP 2020 can become an important foundation for a new educational culture. It has the potential to help Bharat develop a generation that is intellectually capable, technologically competent, socially responsible, culturally confident and prepared to face the uncertainties of the future.

The true success of NEP 2020 will therefore not be measured only by the number of institutions adopting its framework. It will be measured by the quality of human beings that the educational system ultimately develops. If education succeeds in producing curious minds, capable hands, compassionate hearts and responsible citizens, then the transformation envisioned by NEP 2020 will have achieved its deepest purpose. In that sense, the policy can become an important instrument in the larger journey towards a knowledge-driven, innovative, inclusive, self-confident and Viksit Bharat.

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Cognitive Capitalism -Rewriting the Burden of Excellence!

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India, a civilization that gifted the world the concept of zero, has since developed a remarkable obsession with turning its children into one — emotionally, recreationally, and occasionally existentially- in the relentless pursuit of a perfect validation.

From an Organizational Behaviour lens, the Indian STEM ecosystem mirrors a high-stake, highly-rewarding organizational culture— one driven by extrinsic motivation far more than intrinsic curiosity. Deci and Ryan's Self-Determination Theory warned us precisely about this: when autonomy and genuine interest are replaced by rank-chasing and parental validation, students experience psychological detachment from the very subjects they are supposed to love. Learning becomes Performance. Curiosity becomes Compliance.

The education sector itself behaves like a monopolistic market with significant information asymmetry - a classic economic friction. Coaching institutes capitalize on fear, packaging hope as a ₹(2–5) lakh annual subscription. Families from Tier-2 and Tier-3 cities often take loans to fund this gamble, creating what economists would identify as human capital investment under uncertainty, where the expected return is statistically slim but emotionally overestimated due to availability bias.

At the institutional level, Organizational Development (OD) theory points to a glaring gap: Indian STEM institutions, including IITs and NITs and others, remain heavily task-oriented rather than people-oriented - optimizing for output rankings while underinvesting in psychological safety, mentorship ecosystems, and emotional scaffolding. Kurt Lewin's Force Field Analysis would suggest the driving forces (prestige, employment outcomes) vastly overpower the restraining forces (student well-being, pedagogical reform), keeping the system frozen in an outdated equilibrium.

Internationally, Indian STEM students often thrive - but at a personal cost. The immigrant paradox plays out vividly: high academic performance coexists with suppressed identity, social isolation and imposter syndrome. Universities in the US, UK, and Germany consistently report that Indian graduates are technically exceptional yet emotionally underserved, often arriving already conditioned to suppress struggle.

The cruel irony? A system so obsessed with producing problem-solvers has itself become the problem nobody is solving.

What India's STEM ecosystem genuinely requires isn't more mock tests or motivational

posters featuring APJ Abdul Kalam - it needs psychological safety, mentorship with actual human warmth, and the radical institutional admission that a student is not a rank, a percentile, or a return on investment.

Because the country that invented zero ought to know — everything begins there.

"Modern aspiration often produces a strange civilization: a society where young minds are trained to calculate everything except the meaning of their own existence. In the silent corridors of achievement, many learn to engineer success before they ever learn to inhabit themselves."

— inspired by the existential humanism of Erich Fromm and Viktor E. Frankl.

Prototype 2083: A sci-fi short story

Abhimanyu Sinha Chowdhury (AIML/25/020)

"DO NOT SYNC." A screeching, jaded, low bitrate audio blared out the mirror. I see myself saying it. I don't really know if I'm losing it; all I know for sure is that it's over for me. I will try to archive the last few weeks of my life, or at least what I can recall, in ink and paper, physically tangible, because tangible is everything I have learned to trust now, and my mind definitely is everything but tangible right now. I hope anyone who stumbles upon this would shed some light on it and get to the bottom of this, for me.

I am a burnt out final year student who was drowning in debt and parental expectations. The college's grade monitoring AI had already flagged me as "potentially incompetent" and blocked me off of every major job deal, so imagine my surprise when Valiant Technologies & Co., of all the other companies that could have, approached me with a well paying internship program. I was in no position to decline it. They knew they had me. I wish I had read the 30 page long terms and conditions before signing it with a smile on my face. Whether it was to please mom or just to have enough money to pay off my college loan doesn't matter anymore. When I asked "why me?", they said my "neural plasticity" was top tier.

This non disclosure contract required me to undergo a brain surgery to implant an experimental cloud interfacing chip, right inside my prefrontal cortex, that would apparently record and back up every second of my waking hours, every minute detail. My memory is then to be uploaded while I was asleep and this memory is to be used for training their work bots and automated AIs. One month later, the chip would be removed and I would be given a high ranking position in the company's hierarchy. On paper, I worked for them conventionally, while in reality, I was a test subject, a prototype. They assured me that this technology is "relatively safe," with very high success rates across the board and almost no side effects whatsoever other than minor sleep deprivation, which I already dealt with as an insomniac. The procedure itself was said to be "quite noninvasive," while the chip itself was "FDA approved," again, their words, not mine.

Being an aspiring software engineer myself, I certainly had privacy concerns. But the fact that I was being paid for practically doing nothing, and the pay being very generous, along with a confirmed job offer waiting around the corner, I knew I had to undergo the surgery.

I called mom. Her being on the verge of tears of contentment made me withhold the fact that I was essentially just being reduced to a "research and development asset" and the

handsome pay along with the job were just compensation. A bribe, I would go as far as to say, to keep my mouth shut. Then again, naive me was just thrilled to have good food on the table, not caring about the consequences.

The type of money I was being offered was too good to be true. I could close off my college loans and my mom's mortgage within just a month with pay of this grade.

I didn't feel a thing during the surgery and was released just hours later. The chip wasn't visible and neither was I allowed to talk about it. The chip has an integrated micro memory unit that has more than enough storage to backup up to seven days' worth of life experience hours, just in time for my weekly visit to my lavish, new office where they offload the data off me, into their servers. Day one went exactly as any of my usually unremarkable days went, only with a persistent headache. However, something strange did happen that night. I fell asleep. I didn't think much of it when I woke up the next day. "Perhaps just the medication I was given during the surgery," I reasoned with myself. However when the same pattern persisted over the course of a week, I was reasonably concerned.

I was told that the chip's effects varied from individual to individual, and that the chip "unintentionally corrected" my sleep deprivation by putting me to sleep but how would that explain me waking up breathlessly in the middle of the night? "You'd get over it, just give it some time. Personally, I'd recommend you to socialize. How about we start at tomorrow's party?", my complimentary office therapist, Dr. Francis, spewed out, not even caring enough to ask me about any other issues that I might have been facing. I hate this man with every fiber of my being, but I am protocol bound to just smile and accept whatever his "evaluation of my psyche" is. However, he was right about one thing: I had to attend the party. Every one of my friends, family members, teachers and superiors, right at my workplace. The company arranged this for me, as a token of gratitude.

After being done with that day, I was lying on my dorm bed, late at night, anxious about the big day ahead of me, revising my half prepared speech, when the first wave of drowsiness hit me. The colors around me warped. I was feeling mentally foggy, the feeling of being lost in some surreal dreamland, too tired to move. But my body wasn't

I was really feeling tired, and it felt more like my mind was forcing me to sleep, as if it were shutting down against my wishes. I tried staying up to finish my speech but failed miserably. I woke up exactly at 6:50 am, ten minutes

before my alarm went off, not really sure how. I felt exhausted for some reason, but I couldn't get back to sleep either. I started getting ready for the party, reciting the speech in front of the mirror whilst doing my tie, and that's when it hit me: I didn't write a speech this polished and formal, and neither did I prepare it so well. Heck, last time I checked, I didn't

even complete writing it. Then, how was I suddenly able to flawlessly recite such a formal script that didn't even exist?

I was left utterly speechless when I found last night's speech sheet, because not only was it finished, but it was also grammatically corrected with more appropriate wording and in the best handwriting that I possibly could produce. I tried to push the thought aside as I drove up to my workplace party. I put on a smile and lied about how I was happy to be a part of this company and why "working" here was the experience of a lifetime. I felt a bit off, while delivering the speech. That smile, that smile felt forced onto my facial muscles. My fingers weren't twitching and my voice wasn't stuttering as I had feared, even before so many people. I felt the most confident I ever did in a social situation, but this confidence felt more so like a social facade than a real boost. The crowd couldn't tell, though. They congratulated me. My mother was in the front row. She was so happy, and I could tell she was proud of me.

I started feeling increasingly disturbed. As if I weren't in control. I got off the stage, thanking everyone, almost mechanically. I felt a hand in the crowd grasped mine and pulled me through, cutting through the masses and their overwhelming chatter, straight to the empty waiting room. I don't remember his face, just his silhouette and voice. He told me something. Something that I couldn't make much out of, at least right there.

I woke up roughly an hour later, surrounded by my office staff and Dr. Francis. They assumed that I fainted and collapsed in the waiting room. "Sensory overload, my son. Happens more often than you'd think," the doctor added. Something felt wrong. Very wrong. His eyes, the way he looked at me... and the way I looked at the world, something felt different. The initial seed of doubt that was once planted with the development of my new sleeping habits had now bloomed into a vine of mysteries.

On my way back to my dorm, I dropped by my office to very skillfully lift a program schematic file off the director's office using some menial excuse to enter his office. The schematic would let me reverse engineer the same code that when compiled, should in theory let me access the chip's storage library. In essence, it would let me rewatch my memories. And while I didn't necessarily steal it to rewatch my memories, the realization that I should know what the thing in my head is even about had dawned upon me.

That night I sat at my computer, determined to get to the bottom of this. I was always good with computers. They felt like my natural habitat. They felt like the only things that truly understood me, the only thing that I ever had complete control over, unlike my life. I managed to get the code to work on my thirty fourth attempt, thanks to a backdoor left behind by someone, but right when I was about to execute it, I felt my hand freeze. My synapses were all over the place. I felt like I was being crushed. My ribcage felt like it was

cracking. My limbs felt cold, as though they belonged to someone else entirely. My skull felt like it would explode any minute now, painting the walls red. Yet still, I managed to hit the play key with my head banging against the keyboard. What I then saw on my screen shattered me. I wasn't ready for that. I saw myself, through my eyes, waking up mere moments after falling asleep last night, staring at myself in the mirror and then finishing my speech in just a span of a few minutes. This entire episode, that I had no recollection of for whatever reason, actually went down. This was a horrific realization. The feed then goes dark with missing data for hours, perhaps because I was sleeping, or so I told myself right then. I used my head to bang my keyboard again, repeatedly, so that my arrow keys would fast forward the video feed right back to that stranger. My keyboard was covered in blood and my eyes were filled with tears but my body didn't let me burst out into tears. I felt like a visitor in a body again, though this time it's much more pronounced. That was it, him, a tall, brown kid just about my age, face contorted beyond recognition with fear. His badge let me know that he was another one of us interns who worked there. He screamed, at the top of his lungs, enough to get blood gushing out of his throat and mouth yet what he said was almost an inaudible whisper. The juxtaposition between the imagery of him screaming like his life depended on it and the sound it produced being so unnaturally quiet, made my blood curdle. What he said was an incomprehensible, garbled mess. I didn't need to hear it anymore, suddenly I could connect all the dots. My memories aren't just being backed up, they're being monitored, and altered. The chip tells my body to paralyze me when it needs to, or when I don't obey. It explains the restless nights, because while I was sleeping my body was being pulled. And then everything started making sense. The schematic mentioned a particular detail, a fact that the data when recorded passes through another onboard compression unit that compresses and encrypts the data into a tiny file, so then what was all that storage headroom for? An AI? Another digital human imprint? And what was I used for every night? Which of my memories were real and which ones were implanted to gaslight me? All of a sudden, my body writhed with pain. It didn't listen to me. I couldn't move a muscle. I kept writhing and heaving with the otherworldly pain until something snapped as the reality around me was enveloped by a layer of visual noise and optical clutter as if my brain suddenly stopped processing all visual data and fed me the raw, overloading input. I probably fainted.

The next day, I woke up with no recollection of the previous night. But I did hold on to the emotions I felt. So, even if I couldn't for the life of me remember what really went down before I fell asleep on my blood stained keyboard, I did remember how I felt, and how much I felt: afraid and hollow.

There was a scar on my forehead. Humans evolved to be good at rationalization so

as to logically eliminate the "threat" of the unknown. I assumed I fell asleep after having accidentally hit my head somewhere, probably the keyboard.

I don't remember how many weeks passed in between. But I kept feeling this. This rot. This feeling of not acting on my own accord. The feeling of slowly taking the passenger seat in my own body. I rationalized more as a defense mechanism, tried to convince myself that this sort of "mundane corporate life sucks the soul out of people," but this literally? Even the way I converse with people has changed. I've started talking like those sales guys. Persuasive, formal, soulless. I started figuring out the most optimal possible route before attempting any task at hand, even when I consciously tried not to.

These weeks in between were spent in ignorance, financial luxury and mental turmoil. Random episodes of amnesia ensued with blackout like memory gaps. "You'll be alright, just hydrate. And don't forget to take your pills," the exact words were tossed around repeatedly every time I sought out a reason from Dr. Francis. His uncannily insistent claim about "knowing me more than I know myself" is something I just couldn't tolerate at some point, and that's when I stopped visiting him.

Fatefully, yesterday, I stumbled into the schematics again, right in the director's office, and that's when the memories came rushing right back again. I realized perhaps that this was my doing too, their obedient lapdog by night, returning stolen assets whilst putting the real me to sleep. But I was sentient again, then why was there no resistance from the chip this time? Why wasn't my body failing me again? Was the monitoring system offline? It turns out the system was malfunctioning.

The flickering fluorescent light of the office hummed in sync with the throb in my temples as I stared at the terminal screen. The malfunction wasn't a miracle. It was a leak, a crack in the digital firewall they'd built around my consciousness. There, in the cold blue glow of the source code, I saw the "Sync" command scheduled for 04:00 am. It wasn't just a data dump anymore. It was a rewrite. The "extra storage" I had questioned wasn't for my memories, it was a placeholder for a pre optimized personality matrix, a Valiant Standard Professional Interface. I realized then that I wasn't the driver being assisted. I was the legacy data being cleared to make room for a newer, more efficient operating system. My hands shook, not because of the chip's interference, but because for the first time in weeks, the fear was entirely my own. The "malfunction" was just the chip turning dormant to fetch and download the updated files, one that would replace the prototype operating system, me.

Tomorrow, 2nd May, 2083, is the most important day for Valiant Tech.

Tomorrow is the day they'll cement their victory. I would be used as a tech demo and a proof of concept as a pitch to the investors, mostly private security and pharmaceuticals along with top of the line, rival tech giants and megacorporations. Whether this technology

would be weaponized to create the perfect soldier or be used to create the most efficient employee statistically probable, is a fact not known to me. Neither do I know if the chip would still be removed from my brain tomorrow as the contract promised, not that it would matter anyway because I would be irreversibly replaced by tonight.

Tonight, when the chip syncs one final time, this vicious chain of mental and physical torture inflicted upon me would finally end with "me" dissolving in a sea of souls, disappearing into the void of shallow mechanical whirring, dreadful digital static and that familiar, mundane typing noise. Any moment now, my consciousness would be overwritten. Whatever happens now, I can't fall asleep tonight. I won't. I can feel my mind being rewritten in real time. Something is groping inside my skull. I won't take those pills. They'd just sedate me, make my mind easier to take over.

The reality around me has already started distorting and bugging out. I locked myself in my dorm, waiting to face deletion. I was sweating. All I can hear anymore is Dr. Francis's voice through the static. "Don't you crave it too? Perfection? Weren't you tired of being so mediocre? I know for a fact that at least a part of you is glad that we repurposed you into this perfect operating system. This is what society deems to be a successful man. That's all you ever wanted, didn't you?"

"Why me?" I whisper, tears running down my cold face.

"What do you want to believe? You think you're some sort of a prodigy? You are not. The biometric lock didn't need a password, kid. It only needed a 50% DNA match. Why do you think you were chosen for the internship? You were not special, you weren't even remotely interesting. Your genetics gave you another chance, at excellence. Accept it. Go on, son. Become the very thing I've always envisioned you to be, my perfect creation," the disembodied voice echoes through the room and my ribs.

The mechanical whirring of the chip's cooling unit intensifies inside my skull. My flesh feels like it's being ripped off my bones. My own father had turned me into a product.

He is right. There is no fighting it anymore. I can just smile. I know that I will sync, because... I love working for Valiant Technologies & Co. and I owe them everything, including my mortal body, as a part of our licensed and classified business contract.

I... want to meet my mother right now, one last time but I can't. When she actually gets to meet me tomorrow, by then I'd be reduced to a puppet, an asset with zero personality or agency. I finally made her happy. Made her proud, made her smile, just at the expense of myself. And for what? Sooner or later she will realize that it's not really me anymore. But maybe that's what she had always wanted. Someone better than me. Not some introverted, unconventionally genius kid who's average at best in academics, but a conventionally smart, social man. The irony of turning into one, against my wishes, was not lost on me.

I can feel the soullessly formal, sterile greetings and overly sanitized corporate terminology that I would use to talk to her and everyone else, form on the tip of my lips right now, making my stomach churn. I know that tonight, "I" will cease to exist either way. I've even come to terms with that, yet I still do want to go out on my terms without being replaced by a perfectly efficient and optimal working machine, devoid of any humanity, a "product" that would wear my skin, pretend to be me.

As a part of standard Valiant Technology & Co. protocols, I am not allowed to have thoughts that could potentially endanger myself and my brain, which is now a patented property of my employers.

I can't let that happen. By now, I'm literally wrestling with my own body to write anything anymore but this struggle, it's all about to be over. Soon. How can I struggle with something that I can't understand? Whatever is inside that unholy chip dies with me tonight. This won't stop Valiant, far from it. But hopefully when they have no prototype to showcase in that big business meet, that would slow them. Good. I never stood a chance against them anyway, at least this way, I go out, still being me.

Disregarding standard safety protocol is a punishable offense. Triggering system wide shutdown. I love you mom. I'm sorry. I hope I sent you enough to pay off the mortgage.

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The Secret Library

Somoshree Pramanik (CSE/22/027)

It was a rainy evening when Maya came home from school, her backpack heavy and her mind full of thoughts. As she walked into her cozy little room, something caught her eye—a small golden key on the windowsill. She hadn't noticed it before. Her eyes sparkled with curiosity as she picked it up. The key was old-fashioned and beautifully made, with a tiny star engraved on it. She couldn't figure out what it was for. Since no one was around at home, she decided to look around. She checked every drawer, cabinet, and box, but nothing matched the key. Then, she noticed a small, hidden door behind her bookshelf—a door she had never seen before. Her heart raced as she turned the key. It fit perfectly and turned smoothly. The door creaked open, revealing a narrow staircase that twisted downward into the dark. Taking a deep breath, Maya stepped inside, holding her flashlight tightly. At the bottom, she found a small, dusty room filled with old books, maps, and strange objects. It looked like a secret library, waiting to be discovered. Dust motes floated in the dim light, and the scent of old paper and wax candles filled the air. Shelves were stacked with books of every size, some with mysterious symbols on their spines, and there were small chests that seemed to hum with secrets. Maya realized she had found a hidden world, a place filled with forgotten stories and mysteries. She ran her fingers along the spines of the books, feeling a thrill at the thought of discovering stories that no one else had read in decades. From that day on, the rainy evenings became her adventures, the key to her guide, and the hidden library her secret place, a world where imagination had no limits. She often imagined the people who had left these treasures behind and wondered what magical tales might be hidden inside the oldest, dustiest tomes. Each visit felt like stepping into another life, and she knew this secret library would always be her sanctuary, a place where wonder and curiosity reigned supreme.

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The Silent Intelligence of Images

Srijon Karmakar (IT/23/28)

In the modern world, images no longer exist merely to be seen; they exist to be understood. Image processing, once limited to simple enhancement and correction, has evolved into a powerful discipline that enables machines to interpret visual information and respond intelligently. Quietly and efficiently, it has reshaped the way humans interact with technology.

At its foundation, image processing transforms visual data into meaningful information. Early applications focused on improving image quality—sharpening details, reducing noise, and restoring damaged visuals. Today, the field has moved far beyond these beginnings. Images are now analyzed, classified, and interpreted, allowing machines to recognize patterns and make informed decisions.

Artificial intelligence has accelerated this transformation. Through advanced learning models, systems can detect objects, identify faces, analyze medical scans, and interpret satellite images with remarkable accuracy. Tasks that once required human perception are now partially shared with machines, expanding the boundaries of visual intelligence.

Equally important is the shift toward real-time image processing on everyday devices. Smartphones, autonomous systems, and surveillance technologies increasingly process images instantly, without relying on distant servers. This enables faster responses, improved privacy, and seamless interaction between humans and machines.

Modern image processing also extends beyond visible light. Technologies such as thermal and depth imaging allow machines to perceive dimensions of reality invisible to the human eye. As a result, image processing has become a tool not only for observation but for deeper understanding.

However, these advancements raise important ethical concerns. Issues of privacy, authenticity, and bias challenge the unchecked use of visual technologies. As machines gain the ability to observe and interpret, society must ensure that this power is guided responsibly.

Ultimately, image processing represents more than technical progress. It reflects humanity's desire to extend perception, enhance understanding, and reshape the relationship between vision and knowledge. In teaching machines how to see, we are also redefining how we choose to view the world.

The Expedition Beyond the Rive

Ritu Samanta (IT/23/41)

The expedition team from Horizon University had trained for months before flying to East Africa. Their group included Karan, a fearless wildlife photographer; Aisha, a calm and brilliant geography student; Rohan, a tech lover who trusted gadgets more than instincts; and Professor Iyer, their strict but caring mentor. Their goal was simple—map an unexplored forest corridor near a remote savanna region and document rare animal movements.

On the third day, their jeep broke down near a dry riverbed. The radio refused to work, and the GPS showed only a blinking error sign. As the sun dipped low, strange sounds echoed across the grasslands. Rohan tried fixing the engine but failed. With no choice left, Professor Iyer decided they would walk toward a distant range of hills visible on the horizon.

As darkness fell, a sudden storm swept across the land. Heavy rain forced them to run for shelter, and they discovered a narrow cave hidden behind thick bushes. Inside, they found ancient wall carvings of elephants, hunters, and a mysterious spiral symbol. Aisha carefully sketched the images, realizing they were thousands of years old and completely undocumented.

At dawn, Karan noticed footprints outside the cave leading toward the hills. Trusting the trail, the team followed it for hours until they reached a small tribal village. The villagers welcomed them cautiously but kindly, offering water and food. An elderly man examined

Aisha's sketch and smiled, explaining that the cave was known as "The Guardian Rock," believed to protect lost travelers.

The villagers helped repair the jeep using spare tools and parts. As the team prepared to leave, Professor Iyer thanked them and promised to share their story with the world. When the jeep finally started, everyone cheered.

The expedition had begun as a scientific mission, but it ended as a journey of courage, discovery, and respect for a land full of untold stories.

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THE CANVAS OF DESIRE (Chapter– 1)

Usashi Maity (CSE/23/063)

Aditya is a famous Paranormal Activity investigator , he is known not only for his calm and gentle personality but also for his brilliant investigative mind. Once he takes a case, he never lets it go unfinished. His reputation has spread far beyond his own country, gaining him followers from around the world.

Recently, he has been trending across social media. Everywhere people are talking about how cool he is and how brilliantly he solves his cases.

Somewhere deep inside, Aditya enjoyed knowing that people expected the impossible from him.

Many even called him 'Mr. Unbeatable.'

"We are not crazy fans," a group of people commented, "but we always appreciate his work. His last case was terrifying "

"Everyone refused to investigate it… but Aditya took the case and exposed the mystery behind it. He shocked everyone."

Later that evening, during the interview, the novelist asked:

"Mr. Aditya, tell us—how much do you love your job?"

Aditya answered calmly,

"Actually, I don't love my job… My job loves me."

The audience burst into laughter. Aditya smirked slightly.

The novelist continued,

"Everyone says you're brave and unbeatable. Has there ever been a moment when you felt someone might be better than you?"

Aditya replied confidently,

"Never. Because the only person who can defeat me… is myself."

The audience looked at him with admiration.

The novelist then asked,

"So, are you planning to take another case soon?"

"Yes, definitely," Aditya replied.

"And what will your next case be about?"

Aditya smiled faintly.

"Just a painting."

The crowd burst into laughter again. Aditya enjoyed the reaction, a small smirk appearing on his face.

The novelist leaned forward slightly.

"And what's so special about this painting?"

At that moment, the background music in the studio faded.

The scene shifted to a quiet showroom where the painting had been placed.

The lights of the room were switched off. The door remained slightly open, allowing a faint glow from another room to spill across the floor. The light never fully reached the painting, yet the faint sparkles were enough to reveal its image.

Inside the canvas was a town bathed in the colors of evening.

The streets were filled with people smiling freely, their faces bright with celebration. Lantern lights glowed above them as if a grand festival were taking place.

For a moment, it almost felt as if the people inside the painting were smiling directly at the viewer… inviting them to join the celebration.

At the centre of the painting stood a throne.

It did not look luxurious or covered with gold. It was built from simple metal, yet it carried an overwhelming presence — the kind of throne where a victorious warrior might sit after winning a battlefield.

The throne shone brighter than everything else in the painting, almost like a small sun.

Back in the interview, Aditya spoke calmly.

"There isn't much I know about the painting yet," he said. "But the artwork is remarkable. It feels… almost real."

The audience listened carefully.

"However," Aditya continued, "there are some strange rumors surrounding it. Some people claim that the painting consumes its owners."

A wave of shock spread across the crowd.

But Aditya's expression remained completely calm.

"Don't worry," he added casually. "Rumors are just rumors. The last owner of the painting disappeared suddenly, but my research shows he was a drug addict. According to witnesses, he had been behaving strangely before vanishing. Most likely, he simply disappeared to avoid public attention."

The novelist nodded thoughtfully.

"Still," he said, "sometimes strange things hide behind simple stories."

Aditya smiled confidently.

"Perhaps. But exploring dangerous mysteries is exactly what I enjoy. Simple cases are not really my type."

The crowd seemed impressed by his confidence.

The novelist concluded the interview with a smile.

"Then we wish you the best of luck with this case. Hopefully we will meet again when you solve it."

"Thank you very much," Aditya replied.

As the interview ended, the scene shifted back to the painting.

For a brief moment, it almost looked as if the people inside the town were smiling a little wider…

And the throne shone slightly brighter.

After the interview ended, Aditya returned home feeling slightly tired.

He washed up, had a quiet dinner, and spent some time writing in his journal.

Just before going to bed, something caught his attention.

The door of the showroom where the painting had been placed was slightly open.

Aditya frowned.

"Strange…"

He walked toward the room to close it properly.

As he stepped closer, an uneasy feeling crept over him. The air inside the room felt… wrong. Unnaturally still.

Curious, Aditya entered the room.

The lights were still off, yet the painting was clearly visible. It seemed to glow faintly in the darkness, revealing every detail of the scene inside it.

Aditya stood in front of it, studying the artwork carefully.

The town was filled with smiling people celebrating beneath an endless evening sky. Fireworks bloomed above them, and the throne at the center shone like a small sun.

Aditya crossed his arms and spoke quietly to the painting.

"What do you think?" he murmured.

"You won't break me, will you?"

He smirked slightly.

"Before we begin… let me tell you one thing."

He leaned a little closer to the canvas.

"Don't go easy on me. Because I won't go easy on you."
As he turned to leave, something unusual caught his eye.
A dark spot inside the painting.
Frowning, Aditya stepped closer.
Among the joyful faces of the town, there was one figure who was not smiling at all.
Aditya leaned even closer to examine it.
Suddenly his breath stopped.
The figure inside the painting was staring directly at him.
And that face…
Was his own.
Aditya stumbled backward and rushed to the switchboard, turning on the lights.
Bright light filled the room.
He looked at the painting again.
Everything was normal.
No dark spot. No strange figure.
Just a town full of smiling people celebrating under the evening sky.
Aditya stared at the canvas for several seconds before shaking his head.
"I must be tired," he muttered.
He switched off the lights again and closed the door.
But inside the darkness of the showroom…
The fireworks in the painting moved ever so slightly.

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Tour Report on Varanasi And Ayodhya

Arpan Maity (CSE/23/123)

Tours and Excursions form an important part of life experience. Not only do the students discover new places but also learn self-reliance and taking care of themselves. As a part of this experience, a small tour to the famous KASHI (Shiv ki Nagri) and AYODHYA (Ram ki Janmabhoomi) was organized from 12th February 2026 to 17th February 2026. We 4 students (Arpan Maity, Sohandev Karmakar, Aniruddha Chakraborty, Subham Das) of 3rd Year have planned this whole trip and gained a life experience of travelling alone without any help from parents and any agents. We had a great time. The tour was both enjoyable and spiritual.

DAY 1: - We all gather at Mecheda Station early in the morning and take a local train to Howrah. From there we took the metro to Belgachia. From there we took a bus ride to Kolkata Railway Station. Our journey departs from Kolkata Station at 12:10 pm on Agra Cantonment Weekly Express. We had great fun on the train, playing cards, watching the beautiful landscapes and advancing with great excitement. We arrived at Varanasi junction at 10:50 pm and took an auto ride to a Chai stall near to our hotel. We can say that was our best Chai in Varanasi after that we had done our dinner at a restaurant and checked in our hotel i.e. Shree Kashi Paying Guest House is just 5 min walking distance to Kedar Ghat. After checking in our rooms, we go for a stroll to our nearest ghat i.e. Kedar Ghat, we spend some time there and return to our rooms for a good sleep after a tiring day.

DAY 2: - Today we wake up at 9:00 am and freshen ourselves. After that we departed for KAL BHAIRAV TEMPLE. We Worship at the temple after giving a long line. From there we walk a 1Km to KASHI VISHWANATH TEMPLE, there we also take a long line to one of the 12 jyotirlingas dedicated to Lord Shiva. We worship there and take a stroll to the sacred Manikarnika Ghat (Burning Ghat) known for 24/7 cremation all time. After that we took prasadam in Annapurna Sev Ashram. After that we take an auto to Namo Ghat, spend some peaceful time at the ghat. From there we took a boat ride to Daswasmedha Ghat experiencing a beautiful sunset. At Daswasmedha ghat we experienced a spiritual evening Aarti with lots of devotion. After aarti we depart for our hotel and take some rest. After that we had our dinner at the nearest restaurant after that we went to our rooms, took a rest and went for a late-night stroll at Harischandra Ghat experiencing cremation. After that we return to our rooms for a good night's sleep.

DAY 3: - We wake up at 5:00 am, early in the morning for attending Subah-e-Banaras at Assi Ghat with a cup of tea in hand experiencing the most beautiful Ganga aarti with 4 musketeers watching the most emotional sunrise with soaring bird in the sky. After that we

went for a boat ride to Namo Ghat and back to Assi Ghat. After spending some beautiful time on the steps of Ghat then we had a little breakfast and went to visit some close distance temples such as Durga Temple, Tulsi Manas Temple, Sankat Mochan Hanuman Temple. After that we went for BHU - Banaras Hindu University. We took a long trip to Kashi Viswanath and Balaji Temple inside the campus. We had our lunch there and had the best cold coffee in Banaras. After roaming the campus we went to our hotel, take a bath, freshen ourselves went for a long walk to Daswasmedha Ghat, from there we went to Godowlia Chawk for experiencing Banarasi Bhang and Pan (a deadly combination) then spend some times near the ghat taking a sip of tea and done some photoshoots along the ghats and walk to our hotel, had a light snack nearby and went to our rooms for a little nap. Then we went to market for a little bit of shopping and encountered the delicious Chaats of Banaras at Kashi Chat Bhandar and went to a restaurant nearest to the hotel for having our dinner and went for a late-night stroll on the ghats of Banaras. Then we went back to our rooms for a very nice sleep.

DAY 4: - We wake up late at morning packed up our luggage's and hearts with lots of memories, check out from our rooms, take an auto ride to station put our luggage's at the cloak room running for the train to Sarnath but at last we miss it, saw the train departing the platform with lots of expectation going down. Then we thought of a plan for going to Sarnath through the road, immediately we booked an auto ride to Sarnath. There we encountered the Buddhism culture and Temples with many foreign visitors and had our lunch then we took a bus ride back to Godowlia Chowk and spent some peaceful times near the ghats with lots of emotions and memories as it was the last night at Kashi. After that we went to the station by taking an auto ride of a drunken person. After reaching the station we take our luggage's board a train to Ayodhya departing Varanasi with lots of emotions and experience.

DAY 5: - The last day of our journey starts with no sleep night, we arrived Ayodhya early in the morning at 4:00 am again put our luggage's in the cloak room freshen ourselves little bit have a light food outside the station then went for Hanuman Darshan at Hanuman Garri, Ayodhya. There we took a long-time line and had the darshan, then we went for Ram Mandir, there we took a 1km line to Mandir after submitting our phones and watches, then we went for Darshan. After Darshan we had our breakfast near the station and boarded our train at 11:00 am. With no sleep distress body and sweating pages, we went to Mughalsarai to board our last train to Howrah. We landed at Mughalsarai at 3:00 pm in the afternoon. After having lunch there, taking some rest, and packing some food for dinner, we boarded the last train of our journey to Howrah at 8:00 pm.

DAY 6: - We arrived at Howrah at 7:00 am in the morning with a thought for going to these places again in future. We are at that time missing those tiring days and peaceful

nights. After that we went back to our homes and hostels with empty pockets and lots of emotions.

While studying or at work, from my experience everyone should take a break and organize a trip anywhere with friends or families. Enjoy every moment there with them and experience a life time valuable thing i.e. management.

"Every Farewell is a sunset that always awaits the sunrise"

Arpan Maity (CSE/23/123), Sohandev Karmakar (CSE/23/133),
Aniruddha Chakraborty (ECE/23/38), Subham Das (AIML/23/35).

The Men In Blue: A Cricket Legacy

Debanshu Guchhait (AIML/24/005)

In the fields of green where legends play,
With hope and dreams, they find their way.
From sunny days to stormy skies,
With every match, a new rise

From the first World Cup in '83,
To 2024, the journey's a spree. With bat in hand and ball in flight,
They chase glory day and night.

Tendulkar's fire to Virat's blaze,
Both hit centuries, igniting the craze. With Rahul's steadiness, both Dravid and KL,
Dhoni's calm presence, a guiding spell.

From behind wickets to Rishab's fire,
They excel in the game, taking us higher.
Pujara and Rahane, dominating tests,
In the toughest battles, they give their best.

Then comes Hardik, the Kungfu Pandya,
Irreplaceable force, a true dynamo.
From Zack's pace to Jassi's skill,
They strike fear, they bend the will.

With Ashwin Anna and Jaddu's magic,
All-rounders shine, truly fantastic.
Each run and catch, a story told,
Of courage, heart, and spirits bold.

From last to the top, we'll rise and soar,
From Kapil's catch that changed the game,
To Surya's brilliance, igniting the flame.
To Kul-Cha's beauty, changing the game
Dada's passion, Rohit's selflessness,

Both inspire the team to achieve success.
United as one, they rise and fall,
For love of the game, they give their all.

The roar of the crowd, the thrill of the chase,
In every heartbeat, the game finds its place. Through ups and downs, they never despair,
For every setback, they show they care.

So here's the team that makes us cheer,
With passion and pride, they conquer fear.
In the heart of India, cricket shines bright,
Inspiring dreams, igniting the fight.

From past to present, legends unite,
Together they soar, reaching new heights.
The Men in Blue always fights.
With Every victory, their legacy excites! .

Between Us

Pulagam Abhimanyu (IT/23/14)

Something lovely reached me the other day,
Still. No drama. Just quiet.
Honestly? Just being real.
It stayed around more time than I thought it would,
settling into the corners of thought and memory,
still shining, even after being ignored.
What if the quiet took over before we act?
So I keep it safe through quiet moves,
breath pauses, how stillness unfolds,
what happens in quiet seconds, beyond view.
Between us, something gentle is growing —
fragile, far from flawless,
but steady,
built to last through what comes,
gentle like someone who still remembers your name.
Something after this holds no guarantee from luck
or get it when you pause.
It will arrive because we choose one another,
with intention,
once more, then twice after.

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Little Hands Coding

Ik Jasu(CSE/23/169)

Let's code now.
It's help how
Time to learn coding
To start new beginning.
Learning coding is great-
Especially when you are create.

Happy to learn new things.
Are you ready to code in teams?
Now let's learn to code!
Doing many things for fun
Starting enhance your skill.

Common products are create together.
Our team is super.
Doing codes is very happy.
Interesting and engaging our coding activities.
Now we know how to do it better.
Great time we coding together.

THE GEOMETRY OF CHANGE

Srawan Singh Rajput (AIML/23/16)

From Gangtok's peaks where quiet spirits dwell,
I left the hills I loved so deep and well.
A roller coaster ride through changing terrain,
From mountain mist to Kolkata's driving rain.

The freezing air gave way to heavy heat,
As plains of Bengal burned at my feet.
At CEMK, the campus became my new domain,
Exchanging quiet slopes for chaos on the train.

Through three long years of academic stress,
True friends appear to lighten the distress.
We weathered storms and shared the sudden sweat,
Answering growth, a debt I'll never forget.

Though wild and unstable the climate might be,
This shifting world has truly reshaped me.
From high Sikkim stairs to the grounded college floor,
My crazy ride continues onward to year four.

THEY NEVER CARED

Ananya Chakraborty (CSE/25/004)

Oh, how it has changed!
For the better may be.
I've been since eternity,
But the water never cleared.
The sun turns me empty,
The rain fills me up.
Yes, I starve my people,
And I drown them down.
They wash them and spit on me,
The ever-changing city is what I see.
No, these never bore.
Yet, they have damaged my core,
By always showing backs at me,
All I ever wanted is to flee.
No, I wasn't at all cared,
And so, I occasionally flared.
That crystal blue water of mine,
Are lost in the passage of time.
And their trash flow on me now,
To them, I'll return, I vow.
Now, I'm carrying those pieces of me,
Which no one ever cared to see.

— — — — ○ — — — —

If You Are There

Bavru Bahan Adhikary (EE/25/27)

If you were to suddenly disappear from my life,
If one day you left without a word,
Then every road would feel unfamiliar,
Every moment would lose its meaning.
My mornings would forget how to smile,
My nights would stretch endlessly awake.
Even the moon would feel incomplete,
As if it forgot why it shines.
You are the reason my heart believes in dreams,
You are the quiet answer to all my questions.
If someday fate asks me,
"What do you want most from life?"
I would smile softly and say—
"As long as she exists, life exists."
This little feeling of mine,
If someday it reaches you,
Then know—
I wrote it only for you.

— — — — ○ — — — —

CRACK THE NUTS

Akash Samanta (CSE/23/129)

1. How can we drop an egg on a concrete floor without cracking it?
2. On which side of a cup is its handle?
3. What looks like a half apple?
4. If it took eight men ten hours to build a wall, how long would it take four men to build it?
5. How can you lift an elephant with one hand?

Answers:

1. Concrete floors are too hard to crack.
2. Outside.
3. The other half of it.
4. No time at all, it is already built.
5. It is not a problem. Since you will never find an elephant with one hand.

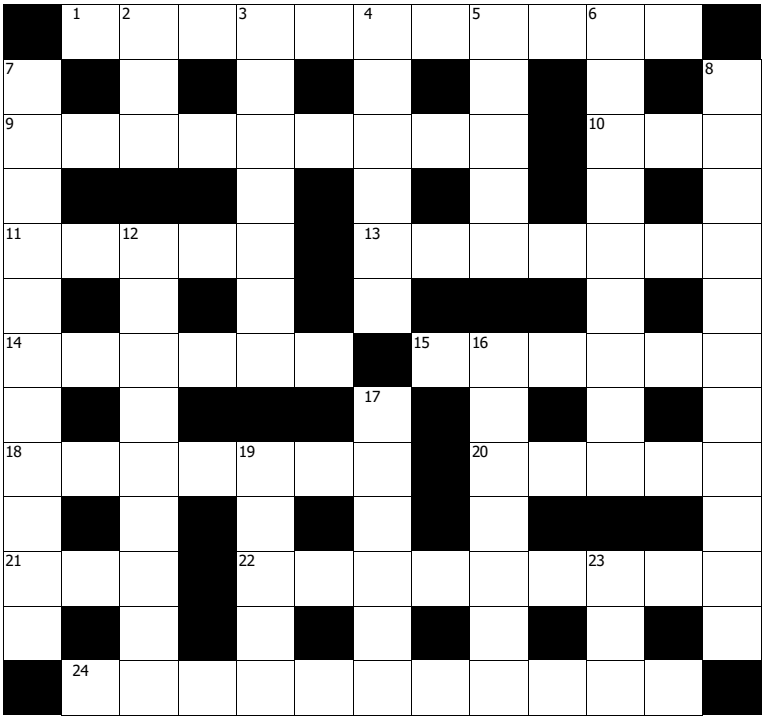
HAVE ANY ANSWER?

Arghya Jana (EE/23/25)

1. Why is abbreviated such a long word?
2. If you try to fail and you succeed, which one have you done?
3. Why do we drive on parkways and park on driveways?
4. Why they call the airport the 'terminal' if flying is so safe?
5. Why they are called the 'apartments' when they are all stuck together?
6. Why doctors call what they do practise ?
7. Why lemon juice is made of artificial flavour while dish-washing liquid is made with real lemons?

CROSSWORD

Adrija Ghosh (CSE/23/197)



Across

1. Move with a mouse (4, 3, 4)
9. Incidentally (2, 7)
10. Gunk (3)
11. Hollywood award (5)
13. Fitting type (7)
14. Weak spot - turn traitor (6)
15. Web browser - protective plate (6)
18. 1916 naval battle (7)
20. Alert (anag.) (5)
21. White wine and cassis drink (3)
22. Globe vegetable? (9)
24. Fish-like cloud formation (8, 3)

Down

2. Wrest - tear (3)
3. Stomachy? (7)
4. Within earshot? (6)
5. Song (5)
6. Front goal (anag.) (5, 4)
7. Ridiculous (6, 1, 4)
8. Shade of vessels? (6-5)
12. Catering establishment (9)
16. Spiralling (7)
17. Rioted (anag.) (6)
19. Expression of disappointment (5)
23. One perceived as uncouth (derog.) (3)

Solution:

	D	R	A	G	A	N	D	D	R	O	P	
B		I		A		E		I		R		B
E	N	P	A	S	S	A	N	T		G	O	O
Y				T		R		T		A		T
O	S	C	A	R		B	A	Y	O	N	E	T
N		A		I		Y				L		L
D	E	F	E	C	T		C	H	R	O	M	E
A		E				E		E		F		G
J	U	T	L	A	N	D		L	A	T	E	R
O		E		L		I		I				E
K	I	R		A	R	T	I	C	H	O	K	E
E		I		C		O		A		I		N
	M	A	C	K	E	R	E	L	S	K	Y	

Who is an Engineer?

Aniruddha Das (CSE/23/107)

4 Years

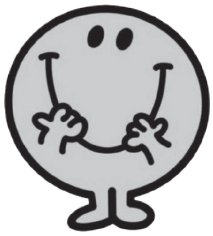
8 Wars (Semesters)

40 Enemies (Subjects)

32 Bullets (Internals)

1 Defender (It's You)

Be Proud To Be An ENGINEER!!!



সূর্য যেমন পূর্ব দিকে ওঠে, তেমনই ---

ড: আলোক রঞ্জন পাল
(অ্যাসিস্টেন্ট প্রফেসর, ডিপার্টমেন্ট অফ কম্পিউটার সাইন্স এন্ড ইঞ্জিনিয়ারিং)

সদ্যজাত সন্তানের লিঙ্গ নির্ধারণে মায়ের কোনো ভূমিকা নেই। না, এটা আমার কথা নয়, এটা দিল্লি হাইকোর্টের একজন জজ মহাশয় একটা case এর রায় ঘোষণার সময় উল্লেখ করেছিলেন। উনি আরও বলেছিলেন যে, সমাজের একটা বৃহৎ অংশের মানুষ, এমনকি অনেক উচ্চশিক্ষিত মানুষও জীববিদ্যার এই ধ্রুব সত্যটি সম্বন্ধে অবগত নন। তাই সমাজের সর্বস্তরের মানুষের মধ্যে এই বিষয়টির সম্বন্ধে সচেতনতা প্রসার প্রয়োজন।

বিষয়টি অনেকদিন ধরেই মাথার মধ্যে ঘুরছে। আমাদের দেশে কন্যাসন্তান জন্ম দেওয়ার জন্য কত মা'কেই না বিভিন্ন কষ্টদায়ক পরিস্থিতির সম্মুখীন হতে হয়! অথচ সদ্যজাত সন্তানের লিঙ্গ নির্ধারণে তার যে কোনো ভূমিকাই নেই, পুরোটাই যে নির্ধারণ হয় বাবার থেকে, এই ধ্রুবসত্যটা আমরা অনেকেই জানি না। বা, যারা বিষয়টি জানি, তারাও যে আশপাশের না-জানা মানুষজনকে জানানোর চেষ্টা করি, এমনটাও না। তাই ভাবলাম, কথাটা এই ম্যাগাজিনেই লিখি। তাতে, আমাদের মধ্যে ১০০ জনও যদি লেখাটা পড়ে থাকেন, তারা প্রত্যেকে যদি তাদের আশপাশের ২ জন মানুষকেও বিষয়টি সম্বন্ধে অবগত করান, তাহলে এই সত্যটি গুণোত্তর প্রগতিতে সমাজে বিস্তার লাভ করতে পারে।

ক) সাইন্টিফিক ব্যাকগ্রাউন্ড

এবার সাইন্টিফিক ব্যাকগ্রাউন্ডটা খুব সংক্ষেপে একটু আলোচনা করা যাক। জেনেটিক সায়েন্সের খুব গভীরে না গিয়েও বিষয়টি সম্বন্ধে একটা সারফেস লেভেল ধারণা মোটামুটি এরকম -

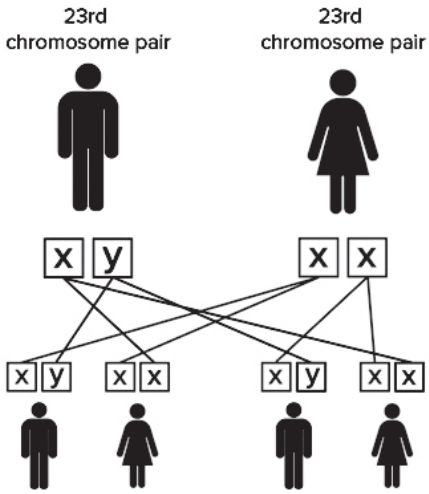
ভ্রূণের লিঙ্গ নির্ধারিত হয় পিতা ও মাতার কাছ থেকে প্রাপ্ত লিঙ্গ-ক্রোমোজোমের সমন্বয়ের মাধ্যমে। নিষেকের সময় পিতার শুক্রাণু (যা- হয় X অথবা Y ক্রোমোজোম বহন করে), মাতার ডিম্বাণুর সঙ্গে মিলিত হয়। ডিম্বাণু সর্বদা X ক্রোমোজোম বহন করে।

যদি X ক্রোমোজোম-বহনকারী শুক্রাণু ডিম্বাণুকে নিষিক্ত করে, তবে গঠিত ভ্রূণে দুটি X ক্রোমোজোম (XX) থাকবে এবং ভ্রূণটি মেয়ে শিশু হিসেবে বিকশিত হবে। অন্যদিকে, যদি Y ক্রোমোজোম-বহনকারী শুক্রাণু ডিম্বাণুকে নিষিক্ত করে, তবে ভ্রূণে একটি X এবং একটি Y ক্রোমোজোম (XY) থাকবে এবং ভ্রূণটি ছেলে শিশু হিসেবে বিকশিত হবে।

Y ক্রোমোজোমে অবস্থিত SRY (Sex-determining Region Y) জিন পুরুষ বিকাশের জন্য অত্যন্ত গুরুত্বপূর্ণ। এই জিনটি পুরুষ প্রজনন অঙ্গের গঠন ও বিকাশের প্রক্রিয়া শুরু করে। অপরদিকে, SRY জিনের অনুপস্থিতিতে নারী প্রজনন অঙ্গের বিকাশ ঘটে।

অতএব, ভ্রূণের লিঙ্গ নিষেকের মুহূর্তেই জিনগতভাবে নির্ধারিত হয়ে যায়। তবে ছেলে বা মেয়ে হিসেবে এর শারীরিক বৈশিষ্ট্যগুলো সম্পূর্ণরূপে প্রকাশ পেতে আরও কয়েক সপ্তাহ সময় লাগে।

উপরোক্ত পরিস্থিতিটি নিম্নলিখিত চিত্রের মাধ্যমে উপস্থাপন করা যেতে পারে।



এই বিষয়টি নিয়ে ইন্টারনেটে সার্ভে করতে গিয়ে কিছু অবাক করা ও মনখারাপ করা তথ্য পেলাম। সেগুলো একটু শেয়ার করি।

খ) কন্যা সন্তান জন্মের পরিস্থিতি: ভারত ও বিশ্ব

কন্যা সন্তান জন্মের পরিস্থিতি সাধারণত জন্মকালীন লিঙ্গ অনুপাত (Sex Ratio at Birth - SRB) দ্বারা মূল্যায়ন করা হয়। এটি প্রতি ১,০০০ জন ছেলে শিশুর বিপরীতে কতজন মেয়ে শিশু জন্মগ্রহণ করছে তা নির্দেশ করে।

১. ভারতে পরিস্থিতি

ঐতিহাসিকভাবে, ভারতে পুত্রসন্তানের প্রতি অধিক আগ্রহ (Son Preference) একটি গুরুত্বপূর্ণ সামাজিক সমস্যা হিসেবে বিদ্যমান। এর ফলে স্বাভাবিকভাবে যত সংখ্যক কন্যা শিশু জন্ম নেওয়ার কথা, বাস্তবে তার তুলনায় কম কন্যা শিশু জন্মগ্রহণ করে আসছে। সাধারণত প্রতি ১,০০০ জন ছেলে শিশুর বিপরীতে ৯৫০–৯৭৫ জন মেয়ে শিশু জন্মগ্রহণ করলে তখন তাকে স্বাভাবিক লিঙ্গ অনুপাত হিসেবে ধরা হয়।

NFHS-5, ২০১৯–২১ অনুসারে ভারতে প্রতি ১,০০০ জন ছেলে শিশুর বিপরীতে প্রায় ৯২৯ জন মেয়ে শিশু জন্ম নিয়েছে।

এবং, SRS ২০২২–২৪ অনুসারে ভারতে প্রতি ১,০০০ জন ছেলে শিশুর বিপরীতে প্রায় ৯১৮ জন মেয়ে শিশু জন্ম নিয়েছে।

২. বিশ্বে পরিস্থিতি

i) সুষম লিঙ্গ অনুপাতযুক্ত দেশসমূহ

অনেক উন্নত দেশে জন্মকালীন লিঙ্গ অনুপাত স্বাভাবিক পর্যায়ে বজায় থাকে।

উদাহরণ: কানাডা, ফ্রান্স, জার্মানি, যুক্তরাজ্য, অস্ট্রেলিয়া।

ii) ভারসাম্যের সমস্যার সম্মুখীন হয়েছে এমন দেশসমূহ

কিছু দেশে পুত্রসন্তানের প্রতি অতিরিক্ত আগ্রহের কারণে জন্মকালীন লিঙ্গ অনুপাত ভারসাম্যহীন হয়ে পড়েছে।

উদাহরণ: চীন, দক্ষিণ কোরিয়া।

iii) যেসব দেশে নারীর সংখ্যা তুলনামূলক বেশি

কিছু দেশে মোট জনসংখ্যায় নারীর সংখ্যা পুরুষের তুলনায় বেশি।

উদাহরণ: জাপান, রাশিয়া, ইতালি।

তুলনামূলক সারণি

দেশ	প্রতি ১,০০০ ছেলে শিশুর বিপরীতে মেয়ে শিশুর সংখ্যা (প্রায়)	পরিস্থিতি
ভারত	~৯২৯	উন্নতি হচ্ছে, তবে এখনও স্বাভাবিক স্তরের নিচে
চীন	~৯০০–৯৩০	পূর্বের ভারসাম্যহীনতা থেকে উন্নতির পথে
দক্ষিণ কোরিয়া	~৯৫০–৯৭০	প্রায় স্বাভাবিক লিঙ্গ অনুপাত
যুক্তরাষ্ট্র	~৯৫০	স্বাভাবিক লিঙ্গ অনুপাত
যুক্তরাজ্য	~৯৫০	স্বাভাবিক লিঙ্গ অনুপাত
কানাডা	~৯৫০	স্বাভাবিক লিঙ্গ অনুপাত
অস্ট্রেলিয়া	~৯৫০	স্বাভাবিক লিঙ্গ অনুপাত

গ) কন্যা শিশু জন্ম সম্পর্কিত আইন ও আইনি কাঠামোর পরিস্থিতি

বিশ্বের অনেক দেশ কন্যা শিশুদের জন্ম, সুরক্ষা এবং সমান মর্যাদা নিশ্চিত করার জন্য বিভিন্ন আইন প্রণয়ন করেছে। এসব আইন মূলত লিঙ্গভিত্তিক বৈষম্য, লিঙ্গ-নির্বাচনমূলক গর্ভপাত, কন্যাশিশু হত্যা (Female Infanticide), জন্ম নিবন্ধন এবং কন্যা শিশুদের সমঅধিকার বিষয়গুলোর উপর গুরুত্ব দেয়।

i. ভারতে আইনি পরিস্থিতি

ভারত সরকার কন্যা শিশুদের অধিকার রক্ষা এবং জন্মের আগে ও পরে লিঙ্গভিত্তিক বৈষম্য প্রতিরোধের জন্য বিভিন্ন আইন ও নীতিমালা প্রণয়ন করেছে।

a) সাংবিধানিক বিধান

ভারতের সংবিধান নিম্নলিখিত অধিকারসমূহ নিশ্চিত করে:

- অনুচ্ছেদ ১৪ – আইনের দৃষ্টিতে সকলের সমতা।
- অনুচ্ছেদ ১৫ – লিঙ্গের ভিত্তিতে বৈষম্য নিষিদ্ধ।
- অনুচ্ছেদ ২১ – জীবন ও ব্যক্তিগত স্বাধীনতার অধিকার।

- অনুচ্ছেদ ৩৯(এফ) – শিশুদের সুরক্ষা ও বিকাশ নিশ্চিত করা।

b) PCPNDT আইন, ১৯৯৪

কন্যা শিশু জন্ম সম্পর্কিত সবচেয়ে গুরুত্বপূর্ণ আইন হলো: Pre-Conception and Pre-Natal Diagnostic Techniques (PCPNDT) Act, 1994.

উদ্দেশ্য

- গর্ভধারণের আগে বা পরে লিঙ্গ নির্বাচন নিষিদ্ধ করা।
- ভ্রূণের লিঙ্গ প্রকাশ নিষিদ্ধ করা।
- আল্ট্রাসাউন্ড ক্লিনিক ও ডায়াগনস্টিক কেন্দ্রগুলোর কার্যক্রম নিয়ন্ত্রণ করা।
- কন্যা ভ্রূণ হত্যা (Female Foeticide) প্রতিরোধ করা।

শাস্তি

- অবৈধভাবে ভ্রূণের লিঙ্গ নির্ধারণে জড়িত চিকিৎসক, স্বাস্থ্যকর্মী বা অভিভাবকদের জন্য কারাদণ্ড ও অর্থদণ্ডের ব্যবস্থা রয়েছে।

c) মেডিক্যাল টার্মিনেশন অব প্রেগন্যান্সি (MTP) আইন

Medical Termination of Pregnancy (MTP) Act

- নির্দিষ্ট চিকিৎসাগত ও মানবিক কারণে গর্ভপাতের অনুমতি প্রদান করে।
- শুধুমাত্র ভ্রূণের লিঙ্গের ভিত্তিতে গর্ভপাতের অনুমতি দেয় না।

d) জুভেনাইল জাস্টিস আইন

Juvenile Justice (Care and Protection of Children) Act

- পরিত্যক্ত ও অনাথ কন্যা শিশুদের সুরক্ষা প্রদান করে।
- দত্তক গ্রহণ এবং পুনর্বাসনের জন্য আইনি ব্যবস্থা নিশ্চিত করে।

e) সরকারি প্রকল্পসমূহ

- বেটি বাঁচাও, বেটি পড়াও (Beti Bachao Beti Padhao)
- সুকন্যা সমৃদ্ধি যোজনা (Sukanya Samriddhi Yojana)
- কন্যা শিশুদের শিক্ষা, স্বাস্থ্য ও কল্যাণে সহায়ক বিভিন্ন রাজ্যভিত্তিক প্রকল্প।

ii. আন্তর্জাতিক আইনি কাঠামো

জাতিসংঘের শিশু অধিকার সনদ (CRC)

ভারতসহ বিশ্বের বিভিন্ন দেশে কন্যা শিশুদের অধিকার রক্ষা এবং লিঙ্গভিত্তিক বৈষম্য দূর করার জন্য শক্তিশালী আইন ও নীতিমালা প্রণয়ন করা হয়েছে। ভারতের PCPNDT আইন, MTP আইন, এবং জুভেনাইল জাস্টিস আইন কন্যা শিশুদের জন্ম ও সুরক্ষা নিশ্চিত করতে গুরুত্বপূর্ণ ভূমিকা পালন করে। একইভাবে, জাতিসংঘের CRC এবং CEDAW আন্তর্জাতিক পর্যায়ে শিশু ও নারীর অধিকার সুরক্ষার জন্য গুরুত্বপূর্ণ আইনি

ভিত্তি প্রদান করে। এসব আইন ও নীতিমালার কার্যকর বাস্তবায়নের মাধ্যমে কন্যা শিশুদের জন্য একটি নিরাপদ, সমান ও মর্যাদাপূর্ণ সমাজ গড়ে তোলা সম্ভব।

ঘ) কিছু গুরুত্বপূর্ণ সরকারি পরিসংখ্যান

i) কন্যা সন্তান জন্ম দেওয়ার কারণে নারীদের হয়রানি সম্পর্কিত সরকারি পরিসংখ্যান (ভারত)

একটি গুরুত্বপূর্ণ সীমাবদ্ধতা হলো, ভারত সরকারের তথ্যভান্ডারে "কন্যা সন্তান জন্ম দেওয়ার কারণে নারীদের হয়রানি" নামে কোনো পৃথক জাতীয় বিভাগ নেই। এ ধরনের ঘটনাগুলি সাধারণত নিম্নলিখিত বৃহত্তর শ্রেণির অধীনে নথিভুক্ত করা হয় -

- গার্হস্থ্য সহিংসতা (Domestic Violence)
- স্বামী বা শ্বশুরবাড়ির আত্মীয়দের দ্বারা নিষ্ঠুর আচরণ (Cruelty by Husband or Relatives)
- পণ-সংক্রান্ত হয়রানি (Dowry Harassment)
- মানসিক নির্যাতন (Emotional Abuse)
- লিঙ্গভিত্তিক সহিংসতা (Gender-Based Violence)

ফলে গবেষকরা সমস্যাটির প্রকৃত ব্যাপ্তি বোঝার জন্য সাধারণত পুত্রসন্তানের প্রতি পক্ষপাত (Son Preference), গার্হস্থ্য সহিংসতা এবং নারীদের বিরুদ্ধে নিষ্ঠুর আচরণ সম্পর্কিত তথ্য ব্যবহার করেন।

ii) পুত্রসন্তান-প্রীতির সরকারি প্রমাণ

ভারত সরকারের অর্থনৈতিক সমীক্ষা (Economic Survey) ২০১৭–১৮ অনুযায়ী, ভারতে প্রায় ২ কোটি ১০ লক্ষ (২১ মিলিয়ন) "অবাঞ্ছিত কন্যা শিশু" (Unwanted Girls) ছিল, যা সমাজে পুত্রসন্তানের প্রতি স্থায়ী পক্ষপাতের প্রতিফলন।

প্রতিবেদনটিতে উল্লেখ করা হয়েছে যে, অনেক পরিবার পুত্রসন্তান জন্ম না নেওয়া পর্যন্ত সন্তান জন্মদান অব্যাহত রাখে।

iii) গার্হস্থ্য সহিংসতা সম্পর্কিত পরিসংখ্যান

NFHS-5 (২০১৯–২১) অনুযায়ী: এই পরিসংখ্যান শুধুমাত্র কন্যা সন্তানের মায়েদের জন্য নয়; তবে বিভিন্ন গবেষণায় দেখা গেছে যে, পুত্রসন্তানের প্রতি অতিরিক্ত আগ্রহ দাম্পত্য সহিংসতার অন্যতম কারণ হতে পারে।

সূচক	শতাংশ
১৮–৪৯ বছর বয়সী বিবাহিত নারীদের মধ্যে যারা স্বামীর দ্বারা শারীরিক, যৌন বা মানসিক সহিংসতার শিকার হয়েছেন	৩২%
শারীরিক সহিংসতা	২৮%
মানসিক সহিংসতা	১৪%
যৌন সহিংসতা	৬%

iv) জাতীয় মহিলা কমিশন (NCW)-এ প্রাপ্ত অভিযোগ

২০২৪ সালে জাতীয় মহিলা কমিশন (National Commission for Women - NCW) মোট ২৫,৭৪৩টি অভিযোগ গ্রহণ করে। এর মধ্যে:

অভিযোগের ধরন	অভিযোগের সংখ্যা
গার্হস্থ্য সহিংসতা	৬,৩২৭
পণ-সংক্রান্ত হয়রানি	৪,৩৮২
পণের কারণে মৃত্যু	২৯২

এই অভিযোগগুলোর অনেক ক্ষেত্রেই সন্তান জন্মদান, পারিবারিক প্রত্যাশা এবং লিঙ্গভিত্তিক বৈষম্যের বিষয় জড়িত থাকলেও, এগুলোকে আলাদাভাবে "কন্যা সন্তান জন্ম দেওয়ার কারণে হয়রানি" হিসেবে শ্রেণিবদ্ধ করা হয় না।

v) NCRB-এর তথ্য

ন্যাশনাল ক্রাইম রেকর্ডস ব্যুরো (NCRB) নারীদের বিরুদ্ধে অপরাধকে নিম্নলিখিত বিভাগে নথিভুক্ত করে:

- স্বামী বা আত্মীয়দের দ্বারা নিষ্ঠুর আচরণ
- পণজনিত মৃত্যু
- গার্হস্থ্য সহিংসতা-সংক্রান্ত অপরাধ
- আত্মহত্যায় প্ররোচনা
- আক্রমণ ও হয়রানি

তবে NCRB কন্যা সন্তান জন্ম দেওয়ার কারণে নারীদের হয়রানি সম্পর্কিত কোনো পৃথক পরিসংখ্যান প্রকাশ করে না।

vi) পুত্রসন্তান-প্রীতি ও সহিংসতার সম্পর্ক বিষয়ক গবেষণা

ইন্টারন্যাশনাল সেন্টার ফর রিসার্চ অন উইমেন (ICRW) এবং UNFPA-এর একটি গুরুত্বপূর্ণ গবেষণায় দেখা গেছে:

- পুত্রসন্তানের প্রতি পক্ষপাত লিঙ্গ বৈষম্যের সঙ্গে গভীরভাবে সম্পর্কিত।
- যেসব পরিবারে পুত্রসন্তানের প্রতি প্রবল আগ্রহ রয়েছে, সেখানে নারীরা দাম্পত্য সহিংসতার বেশি ঝুঁকিতে থাকেন।
- পুত্রসন্তান জন্মদানের চাপ নারীদের মানসিক, অর্থনৈতিক এবং শারীরিক নির্যাতনের শিকার করতে পারে।

কন্যা সন্তান জন্ম সম্পর্কিত গুরুত্বপূর্ণ পরিসংখ্যান

সূচক	মান
ভারতে আনুমানিক "অবাঞ্ছিত কন্যা শিশু"	২ কোটি ১০ লক্ষ (২১ মিলিয়ন)
বৈষম্য ও লিঙ্গ-নির্বাচনের কারণে আনুমানিক "নিখোঁজ নারী" (Missing Women)	৬ কোটি ৩০ লক্ষ (৬৩ মিলিয়ন)
স্বামী কর্তৃক সহিংসতার শিকার নারী (NFHS-5)	৩২%
NCW-এ গার্হস্থ্য সহিংসতার অভিযোগ (২০২৪)	৬,৩২৭
NCW-এ পণ-সংক্রান্ত হয়রানির অভিযোগ (২০২৪)	৪,৩৮২

উপসংহার

এই প্রতিবেদনের ভূমিকাও যা', উপসংহারও তাই। ভ্রূণের লিঙ্গ নির্ধারণে মায়ের কোনো ভূমিকা নেই, কারণ ডিম্বাণু সর্বদা X ক্রোমোজোম প্রদান করে। ভ্রূণের লিঙ্গ নির্ভর করে পিতার শুক্রাণু X নাকি Y ক্রোমোজোম বহন করছে তার উপর। তাই বৈজ্ঞানিকভাবে ছেলে বা মেয়ে সন্তান জন্মের জন্য মাকে দায়ী করা সম্পূর্ণ ভুল ও ভিত্তিহীন।

সূত্র

- UNFPA – Son Preference. (United Nations Population Fund)
- UNFPA & ICRW – Masculinity, Intimate Partner Violence and Son Preference in India. (UNFPA India)
- UNFPA Asia-Pacific – Son Preference. (UNFPA Asiapacific)
- UNFPA – Sex Imbalances at Birth. (United Nations Population Fund)
- Council on Foreign Relations – Domestic Violence and Son Preference in India. (Council on Foreign Relations)

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সোনালী অনুপাত

ডঃ আশীষ মিত্র, অধ্যাপক
মৌলিক বিজ্ঞান ও মানবিক বিভাগ

বর্তমান নিবন্ধটি সোনালী অনুপাত (প্রায় 1.61803398875) নিয়ে আলোচনা করে, যা প্রায়শই সোনালী অনুপাত, সোনালী মধ্যক, ঐশ্বরিক অনুপাত বা সোনালী সংখ্যার মতো বিভিন্ন বিকল্প নামে পরিচিত। যদিও এটি ব্যাপকভাবে জনপ্রিয় এবং সাংস্কৃতিক ঐতিহ্যে প্রোথিত, নিবন্ধটি প্রকৃতি এবং শিল্পে সোনালী অনুপাতের সার্বজনীনতা সম্পর্কে প্রচলিত ভ্রান্ত ধারণা এবং ভুল বোঝাবুঝিকে চ্যালেঞ্জ করে।

মূল ধারণা ও সংজ্ঞা

পরিভাষা	সংজ্ঞা/বর্ণনা
সোনালী অনুপাত (ϕ)	একটি অমূলদ সংখ্যা যা প্রায় 1.618 এর সমান, এবং এটি এমন একটি অনুপাতকে বোঝায় যেখানে A/B=(A+B)/A।
ফিবোনাচ্চি অনুক্রম	একটি সংখ্যা অনুক্রম যেখানে প্রতিটি সংখ্যা তার পূর্ববর্তী দুটি সংখ্যার যোগফল (যেমন, ১, ২,৩, ৫, ৮, ১৩...)। পরপর ফিবোনাচ্চি সংখ্যাগুলোর অনুপাত ϕ এর কাছাকাছি হয়।
সোনালী আয়তক্ষেত্র	একটি আয়তক্ষেত্র যার বাহুগুলো সোনালী অনুপাতে থাকে, ঐতিহাসিকভাবে এটিকে সবচেয়ে নান্দনিক আয়তক্ষেত্র হিসেবে বিবেচনা করা হয়।
ফ্র্যাক্টাল গণিত	একটি গাণিতিক পদ্ধতি যা জটিল, স্ব-সদৃশ এবং প্রায়শই বিশৃঙ্খল প্রাকৃতিক ঘটনা (যেমন,তুষারকণা) বর্ণনা করে, যা ইউক্লিডীয় জ্যামিতি থেকে ভিন্ন।

সারসংক্ষেপ ও ঐতিহাসিক প্রেক্ষাপট

- সোনালী অনুপাত বিভিন্ন প্রাচীন সভ্যতা, বিশেষত গ্রীক ও মিশরীয়দের দ্বারা আবিষ্কৃত বা নথিভুক্ত হয়েছিল এবং পার্থেনন ও গিজার মহা পিরামিডের মতো স্থাপত্যের সাথে এটি বিখ্যাতভাবে (যদিও কিছুটা পৌরাণিক) যুক্ত।
- এটিকে লিওনার্দো দা ভিঞ্চির মতো বহুবিদ্যাবিশারদ এবং ইউক্লিডের মতো গণিতবিদদের সাথে যুক্ত করা হয়।
- এই অনুপাতটি ফিবোনাচ্চি অনুক্রমের সাথে ঘনিষ্ঠভাবে সম্পর্কিত, যেখানে পরপর দুটি সংখ্যার সীমাস্থ অনুপাত প্রায় ϕ হয়।
- এই সংযোগটি "সোনালী সর্পিল" পর্যন্ত বিস্তৃত, যা নান্দনিকভাবে বিভিন্ন প্রেক্ষাপটে ব্যবহৃত হয়।

সমালোচনামূলক অন্তর্দৃষ্টি: কল্পকাহিনী বনাম বাস্তবতা

- বর্তমান নিবন্ধতে যুক্তি দেওয়া হয়েছে যে সোনালী অনুপাত কোনো সার্বজনীন প্রাকৃতিক নিয়ম বা অন্তর্নিহিত জৈবিক নীতি নয়।
- প্রায়শই উদ্ধৃত উদাহরণ, যেমন রোমানেস্কো ব্রোকলি বা নটিলাস শেল, শুধুমাত্র একটি নির্দিষ্ট কোণ থেকে দেখলে অনুপাতটির একটি আনুমানিক রূপ দেয়, যার জন্য প্রায়শই চিত্রের কারসাজি বা নির্বাচিত দৃষ্টিকোণের প্রয়োজন হয়।
- প্রকৃতি সহজাতভাবে সোনালী অনুপাতকে "অনুসরণ" করে না, এবং অনেক দাবিই কারণের পরিবর্তে পারস্পরিক সম্পর্ক মাত্র।
- সোনালী অনুপাত ইউক্লিডীয় জ্যামিতির উপর ভিত্তি করে প্রতিষ্ঠিত, যা আয়তক্ষেত্র এবং বৃত্তের মতো আদর্শায়িত আকারকে মডেল করে কিন্তু জটিল, অনিয়মিত প্রাকৃতিক রূপ (যেমন, পর্বত, ফুলকপি) বর্ণনা করতে ব্যর্থ হয়।
- আরও জটিল কাঠামোর জন্য, ফ্র্যাক্টাল গণিত অ-পূর্ণসংখ্যার মাত্রার স্ব-সদৃশ বিন্যাসের মাধ্যমে আরও ভালো বর্ণনামূলক ক্ষমতা প্রদান করে, যা তুষারকণা এবং আবহাওয়ার ধরনের মতো বাস্তব-জগতের ঘটনাকে মডেল করে।
- ফ্র্যাক্টাল এবং সোনালী অনুপাত-সম্পর্কিত ঘটনাগুলো গাণিতিক সরঞ্জাম বা মডেল, কোনো রহস্যময় সত্য বা গোপন মহাজাগতিক সংকেত নয়।

প্রকৃতির বিন্যাসের জৈবিক ও বৈজ্ঞানিক দৃষ্টিকোণ

- সূর্যমুখী, পাইন ফল এবং আনারসের মতো কিছু জীব প্রায়শই ফিবোনাচ্চি-সম্পর্কিত সর্পিল বিন্যাস প্রদর্শন করে (যেমন, ৩৪ ও ৫৫ অথবা ৫৫ ও ৮৯টি সর্পিলের গণনা), কিন্তু এটি সর্বজনীন নয়।
- ২০১৮ সালের একটি গবেষণায় দেখা গেছে যে প্রায় ২০% সূর্যমুখী ফিবোনাচ্চি বিন্যাসের সাথে মেলে না।
- এই বিন্যাসগুলোর ব্যাপকতাকে কোনো অন্তর্নিহিত প্রাকৃতিক "সোনালী নিয়ম" হিসেবে না দেখে, বরং বিবর্তনীয় দক্ষতার ফল হিসেবে ব্যাখ্যা করা হয়।
- যেসব জীব এই অনুপাতগুলোর কাছাকাছি থাকে, তারা স্থান ব্যবহার বা সূর্যালোক গ্রহণের ক্ষেত্রে অধিকতর দক্ষ হয় এবং ফলস্বরূপ তাদের বেঁচে থাকার সম্ভাবনা বেশি থাকে।
- স্ব-প্রতিলিপিকারী আণবিক সিস্টেমের গাণিতিক মডেলিং দেখায় যে সোনালী অনুপাত অন্যান্য অনেক ধ্রুবকের পাশাপাশি আবির্ভূত হয়, কোনো বিশেষ "সোনালী" মর্যাদা প্রদর্শন করে না।

মনস্তাত্ত্বিক ও সাংস্কৃতিক মাত্রা

- বর্তমান নিবন্ধতে তুলে ধরা হয়েছে কেন মানুষ সোনালী অনুপাতের কল্পকাহিনী ভালোবাসে:
  i. মানুষ জটিল ঘটনার জন্য সহজ, মার্জিত ব্যাখ্যা খোঁজে।
  ii. এই অনুপাতটি এক ধরনের 'ওকামের ক্ষুর' (Occam's razor)হিসেবে কাজ করে – যা জটিলতাকে একটি আকর্ষণীয় আখ্যানে সরল করে তোলে।

iii. এই ধারণাটি সংস্কৃতি এবং বিপণনে গভীরভাবে প্রোথিত, যা প্রায়শই অস্পষ্ট বা দ্ব্যর্থকভাবে ব্যবহৃত হয় এবং এর ফলে ছদ্ম-গভীর বিশ্বাসের জন্ম হয়।

- ছদ্ম-গভীর উক্তির উপর ২০১৫ সালের একটি গবেষণার উল্লেখ করা হয়েছে, যা অস্পষ্ট বা অর্থহীন দাবির মধ্যেও অর্থ খুঁজে বের করার প্রতি মানুষের আকর্ষণকে তুলে ধরে।
- সোনালী অনুপাত প্রায়শই 'লুকানো অর্থ' বা পরিপূর্ণতার প্রতীক, কিন্তু এটি মূলত একটি প্রক্ষেপণ, কোনো অন্তর্নিহিত সত্য নয়।

উপসংহার ও শেষ কথা

- সোনালী অনুপাত গাণিতিকভাবে আকর্ষণীয় এবং একটি অনুপাত হিসেবে নান্দনিকভাবে মনোরম হলেও, একে একটি সার্বজনীন প্রাকৃতিক নীতি হিসেবে অতি সাধারণীকরণ করা উচিত নয়।
- প্রকৃতি অগোছালো ও জটিল, এবং যদিও সোনালী অনুপাত কিছু ক্ষেত্রে দেখা যায়, এটি সেই কাঠামোগুলোকে নিয়ন্ত্রণ বা সংজ্ঞায়িত করে না, যেগুলোকে এটি নিয়ন্ত্রণ করে বলে মনে করা হয়।
- সোনালী অনুপাতকে একটি রহস্যময় বা মহাজাগতিক গোপন বিষয় হিসেবে দাবি করার কোনো বৈজ্ঞানিক প্রমাণ নেই।
- এই নিবন্ধটি সংশয়বাদ, সমালোচনামূলক চিন্তাভাবনা এবং প্রকৃতির গাণিতিক বিন্যাস সম্পর্কে একটি সূক্ষ্ম উপলব্ধিকে উৎসাহিত করে।
- এটি এই চিত্র তুলে ধরে শেষ হয় যে, কীভাবে মানুষের অর্থ খুঁজে পাওয়ার আকাঙ্ক্ষা প্রায়শই সোনালী অনুপাতের মতো আকর্ষণীয় কিন্তু অতি সরলীকৃত ধারণার প্রতি বিশ্বাসকে চালিত করে।

মূল অন্তর্দৃষ্টি

সোনালী অনুপাত (ϕ) একটি আকর্ষণীয় গাণিতিক ধ্রুবক, কিন্তু প্রকৃতির কোনো সার্বজনীন নিয়ম নয়।

প্রকৃতিতে ফিবোনাচ্চি প্যাটার্ন এবং সোনালী অনুপাতের উপস্থিতি হলো পারস্পরিক সম্পর্ক, কারণ নয়।

ইউক্লিডীয় জ্যামিতির চেয়ে ফ্র্যাক্টাল গণিত জটিল প্রাকৃতিক রূপগুলোকে ভালোভাবে ব্যাখ্যা করে।

মানুষের জ্ঞানীয় পক্ষপাত সোনালী অনুপাতের প্রতি অতিমাত্রায় অর্থ আরোপের দিকে পরিচালিত করে (ছদ্ম-গভীর প্রভাব)।

জীববিজ্ঞানে কিছু আনুপাতিক প্যাটার্নের ব্যাপকতা সম্ভবত বিবর্তনীয় দক্ষতার দ্বারা ব্যাখ্যা করা যায়– রহস্যময় সামঞ্জস্যের দ্বারা নয়।

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প্রক্সি অ্যাটেনডেন্সের গোপন ইতিহাস

অভিনব ভট্টাচার্য্য
(অ্যাসিস্টেন্ট প্রফেসর, ডিপার্টমেন্ট অফ কম্পিউটার সাইন্স এন্ড ইঞ্জিনিয়ারিং)

আমাদের কলেজ জীবনের এমন কিছু কিছু ঘটনা থাকে, যেগুলো কোনো সিলেবাসে লেখা থাকে না, আবার কোনো বইতেও লেখা থাকে না, কিন্তু আমাদের প্রতিটি ছাত্রের জীবনে সেগুলো অন্যরকম স্মৃতি হয়ে থাকে। আর সেইসব অলিখিত বিষয়গুলোর মধ্যে সবচেয়ে জনপ্রিয়, সবচেয়ে চর্চিত এবং অন্যতম "গোপন"একটি বিষয় হল – "প্রক্সি অ্যাটেনডেন্স"।

এই 'প্রক্সি'–শব্দটা শুনলেই মনে হয় যেন কোনো গুপ্তচরবৃত্তির গল্প চলছে।

আসলে বিষয় টা কিন্তু সত্যিই তা-ই! এটা এক ধরনের মিশন, যেখানে একজন অনুপস্থিত সৈনিকের হয়ে আরেকজন যোদ্ধা যুদ্ধক্ষেত্রে নাম লেখায়।

ইতিহাস বলছে (অবশ্য এই ইতিহাস কোনো ইতিহাস বইতে খুঁজলে পাওয়া যাবে না), প্রক্সির জন্ম সেই দিন, যেদিন প্রথম কোনো ছাত্র সকালে ঘুম থেকে উঠে বলেছিল–

"এই, আজ না গেলে আবার কিছু হবে না তো..." আর সেই দিনই তার একজন বন্ধু তাকে বলেছিল–

"চিন্তা করিস না, আমি আছি! ম্যানেজ করে নেব"

প্রথম প্রথম এই 'প্রক্সি' বিষয়টা ছিল খুবই সহজ, এই যেমন শুধু টিচার নাম ডাকার সময় একটু গলা চড়িয়ে "Yes Sir!" বললেই ব্যাস, কাজ শেষ।

কিন্তু সময়ের সাথে সাথে এই সাধারণ পদ্ধতি একেবারে "উন্নত প্রযুক্তি"-তে পরিণত হয়েছে।

আচ্ছা আমি বিষয়টা একটু ভেঙে বলি, আজকের দিনে প্রক্সি দেওয়া মানে শুধু নাম ডাকার সময় সাড়া দেওয়া নয়, এটা একটা সম্পূর্ণ পরিকল্পিত অপারেশন।

যেমন ক্লাস শুরুর আগেই নিজেদের মধ্যে মিটিং বসে–

"আজ কার কার প্রক্সি লাগবে?"

কেউ বলে–"ভাই, আজ আমারটা করে দিস, আজ একটু কাজ আছে...'

কেউ আবার খুব আত্মবিশ্বাসের সাথে বলে–

"তুই দেখিস, স্যার আজ খেয়ালই করবেন না!"

এরপর শুরু হয় প্রস্তুতি–

কণ্ঠস্বর কেমন হবে? একটু মোটা না একটু পাতলা?

আসলে সেই বন্ধুর স্টাইলটা ঠিক মত নকল করতে হবে–সে "Yes Sir" বলে, না "Present Sir" বলে?

সবকিছু ঠিকঠাক না হলে কিন্তু মহাবিপদ!

এবার নাম ডাকার সময় ক্লাসরুমটা যেন একটা থ্রিলার সিনেমার দৃশ্য হয়ে ওঠে। সবাই চুপ, সবার চোখ সেই এক বন্ধুর দিকে, আর সে বুক ধড়ফড় অস্থিরতা নিয়ে অপেক্ষা করছে– "কখন রোল নম্বরটা আসবে!"

তারপর হঠাৎ–

"রোল নাম্বার ৩৬?"

এক সেকেন্ডের নিস্তব্ধতা...

তারপর–

"Yes Sir!"

পুরো ক্লাসে মধ্যে যেন তখন এক অদৃশ্য স্বস্তির ঢেউ বয়ে যায়। মনে হয় যেন একটা বড় যুদ্ধ জিতে গেছে সবাই!

তবে সব সময় যে এমন নিখুঁত হয়, তা কিন্তু নয়। কখনো কখনো ভুল হয়ে যায়, যেমন একই নাম দু'বার ডাকা হয়, অথবা শিক্ষক হঠাৎ বলে বসেন– "এই যে, তুমি তুমি, হ্যাঁ দাঁড়াও তো!"

আর তখনই সর্বনাশ, প্রক্সি-দাতা বন্ধুর মুখের রং একেবারে পাল্টে যায়। ক্লাসের সবাই মুখ নিচু করে হাসি চেপে রাখে, আর ভেতরে ভেতরে ভাবে–

"ব্যাস, আজতো শেষ!"

আর এই ব্যর্থ অপারেশন গুলোই পরে হয়ে ওঠে সবচেয়ে মজার গল্প, যে গুলো নিয়ে ক্যান্টিনে বসে দিনের পর দিন হাসাহাসি চলে। কিন্তু প্রক্সি অ্যাটেনডেন্সের আসল সৌন্দর্যটা অন্য জায়গায়। এটা শুধু একটা ট্রিক নয়, এটা কিন্তু বন্ধুত্বের এক অদ্ভুত রূপ।

যে বন্ধু নিজের ঝুঁকি নিয়ে, ধরা পড়ার সম্ভাবনা আছে জেনেও, তোমার জন্য "Yes Sir" বলে– সে আসলে শুধু প্রক্সি দেয়না, সে বলে– "তুই একা নয়, আমি আছি।"

আর কলেজ লাইফে বন্ধুত্বের এই ছোট ছোট "আমি আছি" মুহূর্তগুলোই সবচেয়ে বড় সম্পদ হয়ে থেকে যায়।

তবে এই গল্পের একটা অন্যদিকও আছে। প্রক্সি আমাদের হয়তো কিছু দিন বাঁচায়, Attendance বাড়ায়, কিন্তু শেখার যে আসল উদ্দেশ্য– সেটা কিন্তু প্রক্সি দিয়ে পূরণ হয় না।

ক্লাস মিস করার সাথে সাথে, আমরা অজান্তেই মিস করি কিছু নতুন অধ্যায়, কত কিছু গুরুত্বপূর্ণ আলোচনা, আর কখনো কখনো আমাদের কলেজ জীবনের কিছু মূল্যবান অভিজ্ঞতাও।

তবুও, কলেজ লাইফ মানেই তো শুধু নিয়ম নয়– একটুঅ নিয়ম, একটু দুষ্টুমি, আর অনেকটা আনন্দ।

আর এই প্রক্সি অ্যাটেনডেন্সসেই অনিয়মেরই এক মজার অংশ, যা আমাদের জীবনে হাসি এনে দেয়, আর বন্ধুত্বগুলোকে আরও গাঢ় করে।

হয়তো কয়েক বছর পর, যখন সবাই বিভিন্ন কাজে যুক্ত হয়ে যাবে, নিজের নিজের জীবনে ব্যস্ত হয়ে যাবে,

তখন কোনো একসময়ের ফাঁকে হঠাৎ মনে পড়বে–

সেই ক্লাসরুম, সেই টিচারের নাম ডাকা, আর সেই একটুকু শব্দ–

"Yes Sir!"

আর তখনই মনে হবে–

সেই ছোট্ট "Yes Sir"-এর মধ্যেই লুকিয়েছিল একটা আনন্দময় সময়, বন্ধুত্বের রঙে রাঙানো এক গুচ্ছ গল্প, আর হারিয়ে যাওয়া কলেজ জীবনের এক টুকরো অধ্যায়।

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বাবা তোমায় ছাড়া, আমি দিশেহারা..পলকেই!

সাইনাজ পারভিন (CSE/23/103)

"বাবা "শব্দ দুটি বড্ড ছোটো, হালকা উচ্চারণেও। তবে প্রতিটা মেয়ের কাছে এই শব্দ দুটির ভার কখনও বর্ণনা যোগ্য নয়। তবু ও এক মেয়ের ছোট্ট প্রচেষ্টা....

লেখাটা যে লিখছে তার বয়স এখন কুড়ি। বাবার মুখে "আমার ছোট্ট মা" শব্দগুলো শুনতে শুনতে কখন যে বয়স এক থেকে কুড়ি হয়ে গেলো, টেরই পাওয়া গেলো না। হাঁটি হাঁটি পা পা থেকে শুরু করে তিনমাসের ছোট্টো মেয়েটিকে বেল্ট দিয়ে বুকের মধ্যে বেঁধে বাইকে করে নতুন পৃথিবী চেনানো থেকে, হাত ধরে স্কুলে পৌঁছে দেওয়া আর সেখান থেকেই আজ কলেজ। সময় কেমন হাওয়ায় মিলিয়ে যায়। তবে ভরসা আর আশ্রয়ের জায়গাটা মেয়েটির পরিবর্তন হয়নি আজও। এই যেমন, আজও রাস্তায় হাঁটতে গেলে একখানি হাতের বড্ড অভাব বোধ হয় তাঁর। আজও "নিখাদ ভালোবাসা"র প্রসঙ্গ এলে সে বারবার "বাবা"কেই টেনে আনে। "বাবা"র মত পৃথিবীর কোনো পুরুষকেই তার বিশ্বস্ত মনে হয়না। জীবনের কঠিন পরিস্থিতেতে লড়াইরত অবস্থায় ক্লান্ত পরিশ্রান্ত হয়েও মেয়েটি যখন বাবা নামক যোদ্ধার চোখ দুটোর দিকে তাকায়, তখনই সে আবারও জ্বলে ওঠার সাহস পায়। বাবাই তো সেই মানুষ, যে তাঁকে ডানা দিয়েছে ওড়ার। পুরো সমাজ যখন বলেছিল, মেয়েই তো!! পরের বাড়ি যেতেই হবে, এতো শিখিয়ে পড়িয়ে লাভ কি! হ্যাঁ, সত্যিই মেয়েকে একদিন অন্যের হাতে তুলে দিতে হবে জেনেও বাবা কিন্তু এতটুকুও পিছপা হননি, স্নেহ, ভালোবাসা কমিয়ে দেননি। আগেও তো বাবা সমাজের বিরুদ্ধেই, মেয়ে জন্মগ্রহণ-এর খুশিতে মিষ্টি বিলিয়েছিল সারা পাড়া, ক্রোধান্বিত হওয়ার পরিবর্তে। পুরো পৃথিবী যখন পাশ থেকে সরে যায়, এই মানুষটাই তো বলে, "আমি আছি তো"। পরিবারে খুব অর্থাভাবের দিনেও বিন্দুমাত্র টেরই পেতে দেয়নি। নিজের সমস্ত শখ আহ্লাদকে ত্যাগ করে, তিল তিল করে সন্তানের স্বপ্নে বুনেছে যে, সেই তো মেয়েটির বাবা। জীবনের বিভিন্ন ভুল পদক্ষেপেও যে, বুঝিয়ে নিয়ে বুকটা আবারো এগিয়ে দিয়েছে, সেই একমাত্র মানুষটাই যে বাবা। মেয়ে বড়ো হচ্ছে দেখে অন্যের হাতে তুলে দিতে হবে ভেবেই যার অন্তরটা চূর্ণ বিচূর্ণ হয়ে যায়, নীরবে নিভৃতে চোখ দিয়ে অশ্রু নেমে আসে, প্রকাশ হয়তো কখনোই করে না, তবে সেই মানুষটাই বাবা। শব্দেরা ফুরিয়ে আসে, "বাবা"র মহত্বের বর্ণনা দিতে গিয়ে। পৃথিবীর কোন কোন আশ্চর্য মহামূল্যবান জিনিসের বিনিময়ে এই ঋণ পরিশোধ করা সম্ভব, সত্যিই জানা নেই মেয়েটার!!

তাইতো কুড়িটা বছরের এই গভীর অনুভূতি থেকে মেয়েটি র মনে হয়–

"বাবা ছাড়া সে এক ঠিকানা বিহীন খাম
বাবা ছাড়া পৃথিবীটার নেইতো কোনো দাম"।

ভালো থাকুক এই পৃথিবীতে প্রতিটি সন্তানের সবচেয়ে ভরসাযোগ্য আশ্রয়স্থল "বাবা" নামের মানুষগুলো।।

(~সুনামি)

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"চার বছরের তারের বাঁধন"

সুদীপ্ত মান্না (ECE/22/60)

নতুন পথে, নতুন সকাল, নতুন রঙের দিন,
কলেজ গেটে দাঁড়িয়েছিল স্বপ্নভেজা ঋণ।

অচেনা সব মুখের ভিড়ে কাঁপত ছোট প্রাণ,
এক বেঞ্চেতে বসেই পরে জুড়ল সবার টান।

ECE-র প্রথম ক্লাসে সার্কিট আঁকার ছাপ,
ভুল করলে স্যার বলতেন হেসে–
"আবার ধরো মাপ।"

ক্যান্টিনভরা চায়ের কাপে গল্প নদীর ঢেউ,
দু'দিন যেতেই মনে হতো – সবাই আপন কেউ।

ল্যাবরুমের সেই তারগুলোর অদ্ভুত মায়াজাল,
সোল্ডারিংয়ের গন্ধ মেখে কাটত দুপুরকাল।

বিকেল হলেই মাঠের বুকে হাসির মেলা বসে,
প্রথম বর্ষ শিখিয়েছিল – "বন্ধুত্বই ভরসা শেষে।"

সেমিস্টারের চাপটা তখন বাড়ত ধীরে,
রাত জেগে সব অ্যাসাইনমেন্ট লিখতাম এক নীড়ে।

অসিলোস্কোপ দুলত যেন ঢেউয়ের মতন নীল,
ভাইভার আগে বুকের ভিতর কাঁপত নরম ঢিল।

প্রজেক্ট ফাইল টেবিলজুড়ে, মাথায় চিন্তার ভাঁজ,
বন্ধুরা সব পাশে থাকত সকাল কিংবা সাঁঝ।

স্যারের বকা বজ্র হলেও মমতা ছিল সাথে,
ভুলের মাঝেই শেখার আলো জ্বলত নীরব রাতে।

ক্লাস টেস্টে নম্বর কমে মুখটা হতো চুপ,
বন্ধুর ডাকে হাসি ফিরত – "চল, ক্যান্টিনে এক চুমুক।"

ক্যান্টিনভরা ছোট্ট টেবিল ছিল সুখের দেশ,
দশ টাকার এক কাপ চায়ে ক্লান্তি হয়ে শেষ।

তৃতীয় বর্ষ স্বপ্নমাখা ব্যস্ত দিনের ঢেউ,
ভবিষ্যতের ভাবনাগুলো ঘিরে ধরত কেউ।

মাইক্রোপ্রসেসর কোড লিখতে রাত হত যে ভোর,
একটা বাগে আটকে যেত জীবনযুদ্ধের দৌড়।

গ্রুপ প্রজেক্ট মানেই ছিল ঝগড়া-হাসির সুর,
একজন ঘুম, আরেকজন কাজ – দৃশ্য ভরপুর।

ফেস্টের রাতে আলো ঝলক, গানের নরম তান,
সেই স্মৃতিগুলো আজও বুকে জাগায় অভিমান।

কলেজ মাঠের সবুজ ঘাসে বসত বিকেলবেলা,
হাসির মাঝে লুকিয়ে থাকত হাজার রঙের খেলা।

বন্ধুত্বটা ধীরে ধীরে শিকড় গাঁথা বৃক্ষ,
ঝড় এলেও ভাঙতে পারেনি সময় নামের দীক্ষ।

শেষ বর্ষে সময় যেন উড়ছে পাখির ডানায়,
হাসি যেন লুকিয়ে থাকে বিদায়বেলার ছায়ায়।

প্লেসমেন্টের প্রস্তুতিতে ঘুম হারানো রাত,
তবু সবাই একসাথে ধরে শক্ত করে হাত।

শেষ ল্যাবের সেই সাইনটা আজও লাগে ভার,
চারটি বছরের গল্প যেন বুকের ভিতর পার।

স্যারদের সেই উপদেশ আজও পথের আলো,
জীবনযুদ্ধ শেখায় তারা মাথা তুলে চলো।

কলেজ মাঠ নীরব হয়ে আজও ডাকে নাম,
স্মৃতিগুলো বাতাস হয়ে ফিরিয়ে আনে ঘ্রাণ।

বিদায়বেলার শেষ মুহূর্ত থমকে গিয়েছে,
চারটি বছর চোখের জলে নীরবে ভেসেছে।

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আর ভাল্লাগেনা

সুদীপ ঘোষ (CSE/22/058)

ভোরগুলো এখন কেমন ফ্যাকাশে লাগে,
রোদ উঠলেও মনটা ভালো থাকে না।
কথা বলতে চাই, কিন্তু বলতে পারি না,
মুখে হাসি রাখি, তবু মনটা হাসে না।

কত স্বপ্ন ছিল মনে,
এখন সেগুলো চুপচাপ পড়ে থাকে নিরবে।
দিন যায়, সময় বদলায়,
কিন্তু মনটা যেন একই জায়গায় আটকে থাকে।

এত মানুষ চারপাশে,
তবু একা লাগে নিজেকে।
চেনা রাস্তা, চেনা মুখ,
সবকিছুই আজ অচেনা লাগে।

কাউকে দোষ দিতে পারি না,
সবকিছুতেই নিজেকে দোষী মনে হয়।
হাসতে গেলেই চোখ ভিজে ওঠে,
কেন জানি কষ্টটা আরও বাড়ে।

বলতে ইচ্ছে করে আর ভাল্লাগেনা,
এভাবে নিজের মন লুকিয়ে রাখা।
একটু শান্তি চাই, একটু থামতে চাই,
নিজের সাথে একটু কথা বলতে চাই।

হয়তো একদিন আবার ভালো লাগবে,
মেঘ সরে গিয়ে রোদ উঠবে।
ততদিন নিজেকে বলি ধীরে, আস্তে
সব শেষ হয়ে যায় না,
শুধু সময় লাগে।

ব্যর্থ শিল্পী

দেবপ্রিয় জানা (EE/23/23)

জানেন মশাই আমি এক শিল্পী!
রাতের অন্ধকারে সেই জেগে থাকা চোখ আমার,
আজও হয়তো খুঁজে বেড়াই আমার
সেই নাটোরের বনলতা সেনকে।

জানেন মশাই আমি এক শিল্পী!
নোনা জলে মাখা এক কলমই আমার সঙ্গী।
রাতে শুনতে পাই সেই,
ব্যর্থ শিল্পীর ফিস ফিস করা চিৎকার।

জানেন মশাই আমি এক শিল্পী!
সেই কলম আর খাতাই আমার কারবার ।
রাতের আকাশের তারা হতে চেয়েছিলাম আমি,
ঠিক হয়তো সেই অমলকান্তির রোদের মতো ।

জানেন মশাই , ব্যর্থ সেই শিল্পীকে?
আলোর আঁধারে চুপ করে থাকা সেই মানুষটিকে?
হাতে এক কলম আর চোখে হাজার স্বপ্ন নিয়ে,
সে হেঁটে চলে যায় কোন এক নির্মম রাস্তা দিয়ে ।

জানেন মশাই , সেই শিল্পীকে?
ব্যর্থ প্রেমিক সেই পুরুষ মানুষটিকে?
রোদে দেখা যায় না তার গোলাপ কাটার বিছানা টিকে!
জানেন মশাই সেই ব্যর্থ শিল্পীকে?

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রক্ত

আব্দুল (CSE/22/161)

আবার উঠেছে তর্ক নিয়ে রক্ত
এক না আলাদা ?
তা আপনি কি বলেন
আমি!!!
বললাম আলাদা
জানি বিংশ শতাব্দীর কতকগুলি রক্তচক্ষু আমাকে ঘিরে
মাথা তুলে একবার দেখলাম
ভেতর থেকে কে যেনো বলে উঠলো
সত্য তুমি সত্য
সত্য আমি সত্য
যদি আমি মিথ্যা হতাম
তবে যে রক্ত তাবরেজ আনসারী রক্ত মাখা শরীর
আর কান্না ভরা মিনতি তে জ্বলে উঠেছিল
সে রক্ত জ্বলেনি কেন
যখন দীপু দাস আগুনে পুড়ছিল
যে রক্ত কাশ্মীরী নারীদের আবমাননায় জ্বলে
সেই কিভাবে বিলকিস এর ধর্ষণকারী দের মালা পরায়
যে রক্ত টুপি তে জ্বলে পৈতেয় শান্ত
পাগড়ি তে জ্বলে ক্রস য়ে শান্ত
উঁচু তে জ্বলে নিচুতে শান্ত
যে কবরের মাটি তে শান্ত হয়
কিন্তু চিতার আগুনে জ্বলে না
বলো এক না আলাদা ?
হা!! হা!! হা !!
সত্য সত্য আমিই সত্য
আমার রক্তই সর্বোচ্চ

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অনুভব

অনির্বান প্রধান (CSE/24/011)

মেঘেদের সাথে করি খেলা আমি –
তোমায় স্মরণ করি।
বাতাসের বুকে কান পেতে শুনি –
তোমার শ্বাসের ধ্বনি।
ঝড়েদের সাথে করি দ্বন্দ
তুমিই আছো বলে,
পড়ে গেলে জানি- তুলে নেবে তুমি
প্রেমের পরশ দিয়ে।
পাখিদের মাঝে খুঁজে পাই ওগো –
তোমার গানের সুর,
ঝরণার স্রোতে বেজে ওঠে –
তোমার পায়ের নূপুর।
প্রভাতের সাথে নির্মল তাতে –
বেজে ওঠে শঙ্খের সুর,
প্রকৃতির মাঝে খুঁজে পাই আমি –
তোমার অপরূপ-রূপ।

স্মৃতির মরীচিকা

অনীশ মান্না (CSE/23/26)

অনেক জন্মের পরে বৃষ্টির খোঁজে,
প্রেমিকের স্পন্দন শুধু বোবা চাঁদ বোঝে,
চিলেকোঠার ঘরে লেখা হয় কতো না বলা কথা -
জমতে থাকা গল্পে শেষ হয়ে আসে খাতা ।
প্রতি গল্পে সেই একই নায়ক, একই নায়িকা -
বোঝা যায় না সে ধ্রুবতারা না মরীচিকা,
মিথ্যে প্রেমের প্রতিশ্রুতি কতো আসে যায়,
ভালোবাসার অজুহাতে নদী বয়ে যায়,
চর্যাপদের লিপি থেকে ডেনভারের গিটার-
কখনও বা রাগ মূর্ছনায় ভুলে যাওয়া সেতার-
একাকীত্বের আশীর্বাদে শহরের রাজপথে,
আবার গল্প লিখব তোমার সাথে,
থমকে যাওয়া কবিতা আবার ছন্দ পাবে-
নবজন্মের চেতনায় অভিমান শেষ হবে।

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অনন্তহীন অনুরাগ

অনুশ্রী রুইদাস (IT/23/10)

দুঃখের জ্বালা মম হৃদয় বাহিরে
তাহা ভেদ করে প্রবেশ করো গভীর অন্তরে।

ছুঁয়ে দেখো
মোর মন কত যে কোমল,
দুটি নয়ন চাইছে শুধু তোমারই দর্শন।

পূরণ হবে না জানি অন্তরের এই আশা।

হে প্রিয়তম,
তবুও তুমি আমার সাহিত্যের ভাষা।

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অকথিত কথা

দেবলীনা রায় (CSE/23/040)

জীবন এক প্রাণজ্জ্বল সংগ্রাম, মাঝে থাকে পারস্পরিক যাওয়া-আসা,
সময়ের সঙ্গে ব্যথিত ছন্দে, জীর্ণ হয় সব ভাষা।
কিছু থাকে অতীত, কিছু থাকে বর্তমান এবং কিছু অজানা ভবিষ্যৎ,
আবার তারই মধ্যিখানে থাকে কিছু অপরিস্ফুটক কণ্ঠষ্যাৎ।
কোনো এক অপরিচিত দৃশের অনুধাবনে হয়ে ওঠে না তার প্রকাশ
থেকে যায় সর্ব্বোচ্চারিত, আকাঙ্ক্ষাবিশিষ্ট নিরবিত এক লাশ।
চলতে থাকে মস্তিষ্ক ও হৃদয়ের, সে এক বিরাট বড় দন্ড ;
জাগরিত মনে, উদারিত কণ্ঠে, উজ্জীবিত হয়- হোক সব লণ্ড-ভণ্ড,

কিন্তু ক্ষণিকের এক ধ্বনি ভেসে ওঠে, দিয়ে ওঠে করতান ,
সে এক অবন্ধনে গঠিত বন্ধন, নাম তার 'পিছুটান'।
তা খুব বড়ই সুন্দর, বড়ই মধুর, বড়ই কঠিন বাস্তব -
সময়ের স্রোতে, ধূর্ত স্পন্দনে স্মিত হয় সব কলরব।
অকস্মাৎ কিনারা প্রান্তে, স্বেচ্ছাকৃত সুরে, ধ্বনিত হয়- সান্ত্বনা;
দিয়ে বেড়ায় সমস্ত প্রশ্নের, সর্ব্বপ্রকার দ্বিধার সুষ্ঠিত গণনা।
দুর্নিবার ঝড়ো বাতাস স্তব্ধিত হয়- স্বল্পক্ষণের জন্যে,
যেমন সহসা সাহসে তীব্রভাবে আছড়ে রাখে- তেজময় অরণ্যে।
বয়ে যায় দিন, বয়ে যায় গহন ঘন ঘোর ঘটা,
পড়ে থাকে স্মৃতি, থেকে যায় বেদনাচ্ছাদিত জ্যোতির্ম্ময় এক ছটা।
বৃষ্টিবহুল কর্দমাক্ত পিচ্ছিল পন্থেও - লুটিবেনা তাহার নিজস্বতা;
থাকিবে তাহা লুকায়ে, কম্পিত গোপনে, দেখাইবে আনন্দে মত্তা।
সুরভিত -সৌন্দর্য্যে- সুগঠিত অবস্থানে, অহেতুক বাসনার অন্তরালে,
সমিত এক অকথিত কথা, রইবে সবার আড়ালে ॥

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শীতের বিকেল

ইমরোজ আহমেদ (CSE/23/171)

আমার একটা বিকেল আছে।
ঠিক দুপুর শেষের শীর্ষে।।
সেথা;
শীতের আহলাদ বেশ।
এলোমেলো মিষ্টি রোদের প্রবেশ।।
টবে প্রস্ফুটিত গাছে ধীরগতির
সালোকসংশ্লেষণ।
শুরু হয় ফুলে ফুলে গভীর কথপোকথন।।
আগ বাড়িয়ে কাগজি লেবু দেয় খানিক উঁকি।
পাশে টপ ফ্লোরে ছোট্ট শিশু ও এক দাদুর
খুনসুটি।।
ওই আকাশপানে পক্ষীদলের অবাধ
আনাগোনা।
আমায় খালি বলেই চলে, তুইও উড়তে
পারিস, হেথা নেই মানা।।

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একটু আলো

মাইসা ফারহিন (CSE/23/176)

নরম ভোর নামে আকাশের কোলে,
রোদ এসে থামে জানালার ধারে,
স্বপ্নগুলো জেগে ওঠে মনের তলে,
দিনটা হাসে রঙিন ইশারায় ভরে।

পাতার ফাঁকে হাওয়া গায় গান,
দূর আকাশে বাজে নীরব বাঁশি,
মনে হয় জীবন এত কঠিন নয় জান,
যতটা ভাবি আমরা চুপচাপ উদাসী।

ছোট ছোট সুখ ছড়িয়ে পথে,
চোখ খুললেই দেখা যায়,
মাটির গন্ধ নামে নরম রথে,
মনটা হালকা হয়ে যায়।

এক মুঠো রোদ যদি হাতে ধরি,
সব ক্লান্তি মিলিয়ে যায় ধীরে,
হাসির শব্দ ভেসে আসে ঝরি,
সোনালি বিকেলের নীল নীড়ে।

শেষে বুঝি—সুখ মানে বড় কিছু নয়,
শুধু একটু শান্তি, একটু ভালো,
যে হাসতে পারে সে-ই সত্যি জয়,
কারণ হাসির মাঝেই লুকিয়ে থাকে আলো।

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ধোঁয়া আর স্বপ্নের শহর

নয়ন সিহি (CSE/24/007)

ছয় চিমনি ঘেরা সেই চেনা আকাশ,
যেখানে বিষাক্ত নিশ্বাসেও মেশে বন্ধুত্বের সুবাস।

রূপনারায়ণের পাড়ে যখন রক্তিম সূর্য ঢলে,
কত না-বলা কথা ঢেউয়ের শব্দে ভেসে চলে।

ক্যাম্পাসের সেই করিডোর, আর 'Big Arcade' এর ভিড়,
এসাইনমেন্টের চাপে হারানো রাত-দুপুরেরা স্থির।

'CSE-007' এর খাতায় কত অমীমাংসিত বিশেষ,
সময়ের স্রোতে সেইসব আজ ঝাপসা অবশেষ।

জীবন মানেই তো একরাশ 'Obsession' আর না পাওয়া,
ছুটির বিকেলে একলা নদীর পাড়ে ঝোড়ো হাওয়া।

তবুও দিন শেষে সেই ব্যস্ত শহরের কাছেই ফেরা,
যেখানে আমার স্বপ্নগুলো আজও মায়া দিয়ে ঘেরা।

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"বর্ষা"

প্রিয়ব্রত দত্ত (CSE/23/189)

বর্ষা, তুমি প্রকৃতি মায়ের বড় কন্যা,
তোমা বিনা নদ-নদী, গাছপালা বিষন্ন,
তোমার পরশে নদ-নদী গায় উজানের গান,
গাছপালা, পশুপাখি নৃত্যে মেতে করে কলতান,
দেখে-শুনে মানুষ সকল কবে তোমার জয়ধ্বনি,
অবুঝ সবুজ শিশুমনে এনে দাও সুধা- সঞ্জীবনী,
প্রকৃতিমায়ের কোলে, করে সুধা পান,
শিশু গাহিছে বিবেকের জয়গান,
সেই গান শুনে বিশ্বপিতা
হরষে হন ধ্যানে অধিষ্ঠিতা।।

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ফিরে দেখা কোলাঘাট

সবজু পাত্র (ECE/22/06)

রূপনারায়ণের তীরে দাঁড়িয়ে, স্বপ্নের ডাকে গান,
ভোরের আলোয় জেগে ওঠে, আমাদের সেই প্রাণ।

ক্লাসরুমে চক-এর রেখা, সমীকরণের সুর,
ভুল-সঠিকের খেলায় গড়ে, জীবনের নতুন নূর।

ল্যাবরুমে আলো ঝলমল, পরীক্ষা আর চেষ্টা,
বারবার হেরে জিততে শেখা– এটাই আসল কষ্টা।
ক্যান্টিনভরা চায়ের কাপে, গল্প-হাসির ঢেউ,
বন্ধুদের সেই মুহূর্তগুলো– হারায় না কখনও কেউ।

প্রজেক্ট, অ্যাসাইনমেন্ট, ডেডলাইনের চাপ,
তবু মন বলে– "চল এগিয়ে", হার মানিস না আর।

হোস্টেলের রাত, ছাদের নিচে, স্বপ্ন দেখে মন,
তারার সাথে কথা বলে– হবে নতুন ভোরের দিন।

কোলাঘাটের হাওয়া বলে– "ভয় পাস না রে তুই",
একদিন তুই ছড়িয়ে পড়বি, পৃথিবী জুড়ে তুই।

তবুও শেষে ফিরবি যখন, স্মৃতির ডাকে টান,
এই কলেজই রয়ে যাবে– তোমার জীবনের গান।

দন্দ

শুভদীপ পাত্র (ME/24/01)

প্রেম পশলাই ভিজে এক সাধ
দু পইসা মন,
আজ আমাদের শহর জুড়ে
দেখুক কজন।।
চিনেবাদাম ঘোড়াই চড়ুক গড়ের মাঠে,
একটু ছুঁলে দোষ হইনা
গোলাপ ঠোঁটে,
নাহয় আমরা ভুলই করি
গড়তে গিয়ে এদিক সেদিক ভাংছুরি,
খেরোর খাতাই সেসব আমাদেরি,উপার্জন।
প্রেম পশলাই ভিজে এক সাধ
দু পইসা মন,
আজ আমাদের শহর জুড়ে
দেখুক কজন।।
ঝগড়া ঝাটি আভিমানি রাত ভিজে যাই
পাশ বালিসের মন কেমনে
তুমুল রাগের আন্তমিলে,
আদর ভিসন।
প্রেম পশলাই ভিজে এক সাধ
দু পইসা মন,
আজ আমাদের শহর জুড়ে
দেখুক কজন।।

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নীরব বিদ্রোহ

শেখ হাবিব হোসেন (CSE/23/118)

রাত নামে শহরের ক্লান্ত কপালে,
নিয়নের নীল আলো স্বপ্ন বুনে যায়,
মানুষের ঢেউ ভাসে ব্যস্ত জোয়ারে,
তবু কত চোখ নীরব অন্ধকারে হারায়।

দেয়ালের প্রতিশ্রুতি রোদে ঝরে পড়ে,
কালি মুছে ফেলে সময়েরই হাত,
পথের ধুলো ঢাকে সত্য ধীরে ধীরে,
মিথ্যের মেলা বসে প্রতিদিন রাত।

কথার মেলায় আলো ঝরে মুখের উপরে,
চোখে লুকায় অদৃশ্য স্বার্থের জাল,
নীরব সত্য দাঁড়িয়ে থাকে ভিড়ের ভেতরে,
সবাই দেখে তবু কেউ ভাঙে না সেই দেয়াল।

তবু বাতাসে ভাসে অদৃশ্য এক সুর,
যেন কেউ গোপনে প্রদীপ জ্বালে দূরে,
ভাঙা ইটের ফাঁকেও জন্ম নেয় নূর,
অন্ধকার নিজেই হারে আলোর নীড়ে।

হয়তো একদিন বদলাবে সময়ের রঙ,
নতুন সকাল উঠবে নরম দীপ্তি ঢেলে,
কারণ নীরব বিদ্রোহই সবচেয়ে গভীর সংগ,
যা ইতিহাস লেখে শব্দহীন মেলে।

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ইঞ্জিনিয়ারিং

স্নেহদীপ বিশ্বাস (EE/22/18)

সত্যিই এই কি সেই স্বপ্ন, এই সেই
বাস্তবতা যার জন্য সেই পাহাড়ের
দেশ ছেড়ে চলে আশা।
না কি আমিও সেই ভিড়ের মাঝে এক অচেনা
অজানা অস্তিত্বহীন ভবিষ্যতের খোঁজে সেই পুরোনো রাস্তায়,
যেখানে হাজারো মানুষ
তাদের জীবনের কত স্বপ্ন আশা নিয়ে আসে, কিন্তু,
ফিরে যেতে পারে না, তা যেই
বা কারন হোক না কেন,
কেন চলছি এই ভিড়ের মাঝে বোঝাটা খুবই
অস্বস্তির বিষয়, কখনো মনে হয় যেন সব ছেড়ে
চলে যাই সেই নিরুদ্দেশের খোঁজে।
কিন্তু কিছু জিনিস যা সবসময় আটকে রাখে
সেই অদেখা সুতোর বন্ধনে ।
যদি ছিঁড়ে যায় সেই ।
বন্ধন, তাহলে সেই স্বপ্নের দেশে যাওয়া হবে বইকি,
যেখানে নেই কোনো চাহিদা, নেই কোনো চিন্তা,
নেই কোনো চাপ, নেই কোনো আপত্তি, শুধু শান্তি।
আমি ও ছারছিনা সেই হাল, ছাড়ছি না সেই বন্ধন,
কিন্তু একদিন হঠাৎ করে সব....

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ধোঁয়াশা মাখা ক্যাম্পাস

সৌমদীপ মণ্ডল (CSE/24/035)

ছয় চিমনির দেশে আকাশটা বড় ধূসর,
বিষাক্ত ধোঁয়ায় লেখা হয় রোজকার অবসর।

তবুও এখানে বাতাস ভারী বন্ধুত্বের ঘ্রাণে,
পথ হারিয়ে ফেলে মন অচেনা কোনো টানে।

'Big Arcade'-এর ভিড়ে থমকে দাঁড়ানো বিকেল,
ঝিলপাড়ে বসে দেখা স্বপ্নের ঝিলমিল।

CSE-এর ল্যাবে জমে থাকা কত না-বলা কথা,
ক্যাম্পাসের করিডোরে মিশে আছে নীরবতা।

অ্যাসাইনমেন্টের চাপে বাতিল হওয়া সব 'প্ল্যান',
রূপনারায়ণ শুধু শুনেছে সেই অভিমান।

রক্তাক্ত সূর্যাস্ত আজও বলে– "আমি ব্যস্ত",
তবুও এই ধুলোমাখা পথেই হৃদয় আজ ন্যস্ত।

চলে যাওয়া ট্রেনের হুইসিল কানে বাজে যখন,
স্মৃতির শহরে বৃষ্টি নামে অকারণ তখন।

ধোঁয়া আর কুয়াশায় আবছা সেই দিনগুলি,
কোলাঘাট, তোমায় কি খুব সহজে ভুলি?

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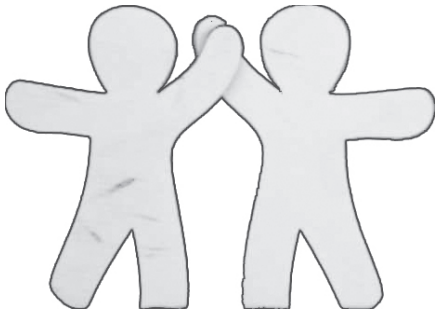

ছোট্ট কবি রবি

সৌভিক গন্ড (CSE/24/146)

ছোট্ট ঘরে বন্দি ছিল
ছোট্ট সে এক কবি।
কাব্যছড়া লিখত শুধু,
আঁকত কিছু ছবি।
কবিতা সে লিখত যখন,
সূর্যি মামা হেসে
আকাশখানা রাঙিয়ে দিত
লাল আবিরে মেখে।
বৃষ্টি শেষে ইন্দ্রধনু
উঠত যখন বেঁকে,
তুলি দিয়ে তার সে ছবি
খাতায় নিত এঁকে।
নব বসন্তে নবীন ডালে
ডাকত যখন পিকা,
কোলাহলে থাকলেও তার
লাগত বড় একা।
দূর বনেতে পলাশ যখন
সাজত লালে লাল,
হর্ষ-হাসির সেই নৌকায়
ধরত শিমুল হাল।
দক্ষিণা বায় মাঝে মাঝে
হঠাৎ দিত ঠেলা,
কোন সুদূরে ভাসিয়ে দিত
শিল্পী-কবির ভেলা।
সবাই তাহার ছোট্ট মনে
স্বপ্ন ঝরায় কত,
হয়তো বা সে সেইখানে
আঁকত মনের মতো।
একধারে সে শিল্পী ছিল,
আর এক ধারেতে কবি–
বলো তো, কে হতে পারে সে?
সে কি মোদের রবি?

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প্রকৃতির ডাকে

সৌভিক ঘোষ
(অ্যাসিস্ট্যান্ট প্রফেসর, কম্পিউটার সাইন্স এন্ড ইঞ্জিনিয়ারিং ডিপার্টমেণ্ট)

ভোরের কুয়াশা ছুঁয়ে
নদী জেগে ওঠে ধীরে,
পাখিরা রাঙিন সুরে
আকাশ ভরে দেয় নীলে।

ঘাসের ডগায় শিশির
সূর্যের আলোয় ঝিলমিল,
বনের নিঃশ্বাসে যেন
পৃথিবী হয় অবিকল নীল।
দূরে তালগাছ দোলে
হাওয়ার নরম গানে,
মাটির গন্ধ ভেসে আসে
মেঘের ভেজা টানে।
এই প্রকৃতির কোলে
মন খুঁজে পায় ঠিকানা,
নদী, আকাশ, সবুজ মাঠ
সবাই যেন আপন জানা।

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বহু বছর পর হঠাৎ সে

শুভম দাস (ECE/22/62)

কালীপূজার রাতে মন্দির প্রাঙ্গনে,
প্রদীপের আলো জ্বলে আঁধারের আলিঙ্গনে
প্রণাম সেরে চোখ খুলতেই দেখি,
সামনে দাঁড়িয়ে সে - ঠিক আগের মতোই মায়াবী।

বহুবছর পর তার চেনা সেই মুখ,
কথাহীন থেকেও বলে কত সুখ
ঢাকের তালে তালে শুরু বুকের ভিতর কাঁপন,
ধূপের ধোঁয়ায় ভাসে পুরনো স্বপন।

হয়নি একটিও কথা দুজনার মাঝে,
শুধু দৃষ্টি বাধা পড়ল সময়ের ভাঁজে
কিছু বলার সাহসও জোটেনি,
কারণ, একতরফা ভালোবাসা শব্দ খোঁজেনি।

ভিড়ের মধ্যে দাঁড়িয়েছিল সে আলোর পাশে,
আমি ছিলাম আঁধারে নিজেরই আবেশে
মানুষজনের কোলাহলে ঢেকে গেল মনের ডাক,
চাওয়া-না-পাওয়ার মাঝেই রয়ে গেল ফাঁক।

সে চলে গেল তার চেনা পথ ধরে,
আমি রইলাম দাঁড়িয়ে নিজের কল্পনার ঘোরে
সেই রাতে বুঝলাম, কিছু ভালোবাসা থাকে–
শুধু দেখার জন্য, শুধু মনে রাখার জন্য,
পাওয়ার জন্য নয়, শুধু মনে করিয়ে দিতে যে–
কিছু অনুভূতি কখনো শেষ হয় না, শুধু নীরব হয়।

সময়ের স্রোতে কত কি বদলে যায়,
স্মৃতির ছেঁড়া পাতায় আজও সে ছায়া ফেলে যায়।
হয়তো এভাবেই পূর্ণতা পায় কিছু অধরা টান,
প্রাপ্তিহীন বুকের এক কোণে জমে থাকে এই পিছুটান।

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এখন আমি ছুটিতে

শ্রীমন চক্রবর্তী (ECE/22/44)

আবার যখন ফিরবো আমি-
এই বন্ধুত্বের শহরে,
প্রেমের শহর ছাড়িয়া আমি
-ফের তোমায় হারিয়ে।

তোমায় আবার চাইবো আমি
সেই বন্ধু অন্যতম,
বিনা যার প্রেমে পড়ি
-রহিবে সেই বন্ধন এক সম।

আমি আবার ফুটবো নবসাজে
সেই বন্ধুত্বের গালিচায়,
তুমি আবার আগলাবে সেই ফিরে
পুরানো নীতির চালে, নতুন আমায়।

নিষেধ থাকবে বাতাসের সেইদিন-
তাঁর গন্ধ আমার রন্ধে রটাতে,
ফিরবো আমি আবার সেদিন দেখো
-এখন আমি ছুটিতে।

কবিরা আবার লিখবে নতুন গান
আমাদের বন্ধুত্বের গণিতে,
ভুলের সেদিন থাকবে বরং মাফ
-কষ্ট হবে না ক্ষমার চাহিতে।

সেইদিন আমি ফিরবো ঠিকই দেখো
পিঠের ওপর পড়বে আবার হাত,
মজার মানে বুঝবো দুজনাতেই
কলহ ছাড়া কাটবে আবার রাত।

সন্দিগ্ধ মন আবার সন্দেহে-
রাখবে সেই 'বয়েই গেলো'-র ধাঁধা,
মনে মনে নিশ্চয় বাসে ভালো
বলতে পারে না, আজব এক গাধা!

সেইদিন সেই ভুলের আগেই আমি-
আটকাবো মন, দোটানার ভিড়েতে
প্রেমটা আর বাছবো না ভুল করেও
রয়ে যাক সেটা বন্ধুত্বের আড়েতে।

মিথ্যে আমি বাঁচছি আফসোসে
ফিরতে পারি চেষ্টার দৃঢ় ভীতে,
আবার যদি ফিরি কখনো, ফিরবো
-এখন আমি ছুটিতে।।

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শেষ ট্রেনের হুইসেল”

গৌরীশ পাল (CSE/25/058)

কুয়াশায় ঢাকা স্টেশনের বুকে নিভে আসে লাল আলো,
ঘড়ির কাঁটারা জানান দিচ্ছে - সময় ফুরিয়ে এলো।
হুইসেল বাজে সুদুর অতীতে , চেনা প্ল্যাটফর্ম জুড়ে,
একটা অধ্যায় শেষ হতে চলল, ট্রেনের চাকার সুরে।

আমরা দাঁড়িয়ে একলা লাইনে, হাতে ধরা টিকিটখানি,
ঝাপসা আলোয় চেনা মুখগুলো, স্মৃতির চাদরে টানি।
ক্যাম্পাসের সেই হাসিমুখ, আর আড্ডার শেষ গান।
প্ল্যাটফর্মের ধুলোয় মিশেছে আজ বিদায়ের আহ্বান

একটু আগেই যে চত্বর মেতেছিল কোলাহলে,
সে আজ নিঝুম, থমকে দাঁড়িয়ে একফোঁটা চোখের জলে।
লোহার লাইনে কম্পন জাগে, ট্রেনের হেডলাইট জ্বলে,
সুযোগেরা সব হারিয়ে যাচ্ছে, দুর সীমানার তলে।

গার্ডের বাঁশি জানান দিলো - আর তো সময় নাই,
ইঞ্জিন থেকে ওঠা কালো ধোঁয়া ছড়ালো মনের ছাই।
যে হাতটা আজ ধরতে চেয়েও ছোঁয়া হলো না আর,
সে রয়ে গেলো ওপারে দাঁড়িয়ে, এপারে বন্ধ দ্বার

ধীরে ধীরে ট্রেন গতি বাড়িয়ে চলল আঁধার চিরে,
চাইলেও আর কোনোদিনও ভাই, পারা যাবে না তো ফিরে।
ফেলে আসা মূখ, চেনা করিডোর;ডায়েরির ছেঁড়া পাতা-
স্টেশন মাস্টার একলা রাতে ওল্টায় স্মৃতির খাতা|

গতির নিয়মে হারিয়ে গেলো রাতের শেষ ট্রেন,
পকেটে রয়ে গেলো কালি ফুরানো একলা অবুঝ পেন।

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ন্যাশনাল এসেসমেন্ট এন্ড অ্যাক্রেডিটেশন কাউন্সিল

সিদ্ধার্থ চ্যাটার্জী
(অ্যাসিস্ট্যান্ট প্রফেসর, কম্পিউটার সাইন্স এন্ড ইঞ্জিনিয়ারিং ডিপার্টমেন্ট)

শিক্ষার আঙিনায় জ্বলে যে মানদীপ,
মূল্যায়নের আলোয় গড়ে ওঠে সঠিক রীতি।
শব্দ নয়, প্রমাণে কথা বলে যে বিচার,
মানের মাপকাঠিতে মেলে ভবিষ্যৎ অধিকার।
প্রশ্ন করে, দেখে, বোঝে–নিরপেক্ষ দৃষ্টি,
সংখ্যার আড়ালে খোঁজে সাধনার সৃষ্টি।
শিক্ষা, গবেষণা, সমাজের সেতুবন্ধন,
সবখানেই ছুঁয়ে যায় মানের নিরীক্ষণ।
শুধু গ্রেড নয়, উন্নতির আহ্বান,
আজকের সীমা ছাড়িয়ে আগামীর সন্ধান।
স্বচ্ছতা, দায়িত্ব, উৎকর্ষের ডাক,
প্রতিটি প্রতিষ্ঠানে জাগায় বিশ্বাসের ঝাঁক।
ন্যাশনাল অ্যাসেসমেন্ট অ্যান্ড অ্যাক্রেডিটেশন কাউন্সিল–
একটি নাম নয়, এক দর্শন গভীর,
যেখানে মানই মূলধন,
সেখানেই শিক্ষার সত্যিকার অধিকার স্থির।

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मैं वही हूँ

निकिता तिवारी (CSE/25/007)

कभी कुछ शब्द हवा में तीर बने,
धीरे से आए, पर दिल चीर गए।
उनकी गूँज लंबे समय तक रही,
और मेरे भीतर कई सपने बिखर गए।

जैसे काँच ज़मीन पर टूट जाता है,
वैसे ही मेरा संसार बिखर गया था।
मैं मुस्कुराती रही दुनिया के सामने,
पर भीतर हर दर्द ठहर गया था।

वर्षों तक अपने मन की गलियों में,
मैं खामोशी का बोझ उठाती रही।
अनकहे राज़, भीगे हुए आँसू,
अपने सीने में ही छुपाती रही।

फिर एक दिन सब स्पष्ट हुआ,
हर घाव का अर्थ समझ में आया।
टूटना भी ज़रूरी था शायद,
तभी जीवन ने नया रूप पाया।

मैंने अपना सच स्वीकार किया,
डर के परदे एक-एक कर हटे।
जो रास्ते कभी काँटों से भरे थे,
वहीं आज मेरे साहस के फूल खिले।

समय ने घाव तो भर दिए,
पर कुछ निशान साथ छोड़ गया।
वही निशान मेरी पहचान बने,
और मुझे पहले से मज़बूत कर गया।

अब मेरी आवाज़ मेरी अपनी है,
मैं उसे खुले आसमान में गाती हूँ।
जो दर्द कभी मेरा बोझ था,
उसे आज अपनी ताकत बताती हूँ।

मैं आज जो भी हूँ,
वह बीते कल की देन है।
मेरी हर हार, हर आँसू,
मेरी नई उड़ान की नींव है।

मैं वही हूँ,
जो कभी खो गई थी राहों में।
और वही हूँ,
जो खुद को पा गई है चाहों में।

मैं वही हूँ–
अपने सफ़र, अपने संघर्ष,
और अपनी कहानी की वजह से।
मैं वही हूँ–
क्योंकि कभी मैं कोई और थी।

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द्रौपदी

इशिका गुप्ता (CSE/23/151)

अग्नि की ज्वाला से जन्मी थी वह,
पर अग्नि से भी अधिक प्रखर थी।
केवल रूप की रानी नहीं,
विचारों की भी वह सम्राज्ञी थी।

सभा के मध्य जब धर्म मौन था,
और न्याय कहीं खो गया था,
तब एक स्त्री ने प्रश्न उठाया–
"क्या शक्ति ही सत्य हो गया था?"

उसकी वाणी में था साहस,
नेत्रों में स्वाभिमान का प्रकाश,
विपदाओं के घोर अंधेरों में भी
नहीं छोड़ा उसने आशा का विश्वास।

वनवास की पीड़ा सहकर भी
उसका धैर्य कभी टूटा नहीं,
अन्याय के सम्मुख झुक जाने का
विचार भी उसके मन में फूटा नहीं।

वह करुणा थी, वह क्रांति थी,
वह संघर्षों का उद्घोष थी,
द्रौपदी केवल एक नाम नहीं,
नारी-अस्मिता का अमर घोष थी।

आज भी जब अन्याय बढ़ता है,
और सत्य अकेला पड़ जाता है,
द्रौपदी का निर्भीक स्वर
हर युग को साहस दे जाता है।

वह प्रश्न है, वह चेतना है,
वह स्वाभिमान की ज्योति अपार,
महाभारत की वह नायिका नहीं मात्र,
युगों-युगों तक प्रेरणा का आधार।

———————○———————

मेरी हर उड़ान की वजह – माँ

स्नेहा यादव (CSE/23/138)

जब दुनिया मुझे समझ नहीं पाती,
तब एक चेहरा बिना कहे सब समझ जाता है –
वो मेरी माँ होती है।

मेरी छोटी सी तकलीफ़ पर
जिसकी आँखें नम हो जाती हैं,
और मेरी एक मुस्कान के लिए
जो अपनी सौ परेशानियाँ छुपा जाती है।

मैं कभी-कभी ज़िद में ऊँची आवाज़ में बोल देती हूँ,
पर उसने कभी हिसाब नहीं रखा।
मेरी गलती पर डाँटती ज़रूर है,
पर उसके हर शब्द में छुपा होता है डर –
कि कहीं उसकी बेटी ठोकर न खा जाए।

उसने अपने अधूरे सपनों को
मेरे सपनों की राह बना दिया,
और कभी जताया भी नहीं
कि उसने मेरे लिए क्या-क्या छोड़ दिया।

माँ कोई बड़ा शब्द नहीं है,
पर उसके बिना
मेरी हर उड़ान अधूरी है।

— — — — — — O — — — — — —

एक इंजीनियर की कहानी, हॉस्टल की ज़ुबानी

स्नेहा कुमारी (CSE/23/150)

लोग अक्सर सोचते हैं कि इंजीनियर्स सिर्फ लेक्चर्स, असाइनमेंट्स और एग्ज़ाम्स से बनते हैं। उन्हें लगता है कि एक इंजीनियर की पहचान उसकी डिग्री, उसके मार्क्स और उसकी प्लेसमेंट से होती है। लेकिन हर इंजीनियर जानता है कि उसकी असली पढ़ाई क्लासरूम के बाहर शुरू होती है। कुछ सबक बुक्स में लिखे होते हैं, और कुछ हॉस्टल की उन दीवारों पर जो हर दिन एक नई कहानी देखती हैं।

एक इंजीनियर को फॉर्मूलाज़ कॉलेज सिखाता है, लेकिन ज़िंदगी हॉस्टल सिखाता है। यहीं वह पहली बार घर से दूर रहना सीखता है, अपनी रिस्पॉन्सिबिलिटीज़ उठाना सीखता है, हार के बाद संभलना और मुश्किल समय में खुद को मज़बूत रखना सीखता है। हॉस्टल सिर्फ रहने की जगह नहीं होता, बल्कि एक ऐसी दुनिया होती है जो धीरे-धीरे एक स्टूडेंट को इंजीनियर से ज़्यादा एक बेहतर इंसान बना देती है।

जब एक स्टूडेंट पहली बार अपना घर छोड़कर हॉस्टल आता है, तो उसके पास एक सूटकेस होता है और दिल में हज़ारों सवाल। नई जगह, नए लोग और नई ज़िंदगी। शुरुआत में हॉस्टल का कमरा अजनबी लगता है, लेकिन धीरे-धीरे वही कमरा उसकी कहानियों का हिस्सा बन जाता है।

हॉस्टल में कोई भी अकेला नहीं रहता। यहाँ हर कॉरिडोर में एक दोस्त मिल जाता है, हर रूम में एक कहानी चल रही होती है और हर रात एक नई याद बन रही होती है। कभी मेस के खाने की शिकायतें, कभी रात के 2 बजे की मैगी, कभी अटेंडेंस का डर और कभी एग्ज़ाम्स से पहले की घबराहट–ये सब मिलकर हॉस्टल लाइफ को खास बना देते हैं।

हॉस्टल सिखाता है कि ज़िंदगी हमेशा परफेक्ट नहीं होती। कभी पैसे कम पड़ जाते हैं, कभी घर की याद सताती है और कभी लगता है कि सब कुछ बहुत मुश्किल है। लेकिन फिर वही दोस्त कंधे पर हाथ रखकर कह देते हैं कि सब ठीक हो जाएगा, और सच में सब ठीक हो जाता है।

इंजीनियरिंग की बुक्स फॉर्मूलाज़ और थ्योरीज़ सिखाती हैं, लेकिन हॉस्टल सब्र सिखाता है। कॉलेज टेक्निकल नॉलेज देता है, लेकिन हॉस्टल इंसानों को समझना सिखाता है। क्लासरूम करियर बनाना सिखाता है, लेकिन हॉस्टल कैरेक्टर बनाना सिखाता है।

सालों बाद जब एक इंजीनियर अपनी डिग्री हासिल करता है, तो उसे सिर्फ लेक्चर्स और प्रैक्टिकल्स याद नहीं रहते। उसे याद रहती हैं वो रातें जो कभी खत्म नहीं होती थीं, वो दोस्त जो परिवार बन गए, और वो छोटा सा रूम जहाँ उसने खुद को पहचाना था।

"इंजीनियरिंग हमें प्रोफेशन देती है, लेकिन हॉस्टल हमें वो इंसान बनाता है जो हर मुश्किल में भी मुस्कुराना जानता है।"

डिजिटल युग में मानवीय मूल्य

प्रोफ. (डॉ) शोभा गुप्ता
सह प्राध्यापक
विद्युत् अभियांत्रिकी विभाग
कॉलेज ऑफ़ इंजीनियरिंग एंड मैनेजमेंट, कोलाघाट

प्रस्तावना

वर्तमान समय को डिजिटल युग कहा जाता है। सूचना एवं संचार प्रौद्योगिकी के अभूतपूर्व विकास ने मानव जीवन के प्रत्येक क्षेत्र को प्रभावित किया है। आज इंटरनेट, स्मार्टफोन, कृत्रिम बुद्धिमत्ता (AI), सोशल मीडिया तथा डिजिटल प्लेटफ़ॉर्म हमारे दैनिक जीवन का अभिन्न अंग बन चुके हैं। शिक्षा, स्वास्थ्य, व्यापार, बैंकिंग, मनोरंजन और प्रशासन जैसे क्षेत्रों मैं डजिटल तकनीक ने कार्यों को सरल, तीव्र और सुविधाजनक बनाया है। कितु इस तीव्र तकनीकी विकास के साथ-साथ यह प्रश्न भी महत्वपूर्ण हो गया है कि क्या हम अपने मानवीय मूल्यों को सुरक्षित रख पा रहे हैं? डिजिटल युग में मानवीय मूल्यों की प्रासंगिकता पहले से कहीं अधिक बढ़ गई है।

मानवीय मूल्यों का महत्व

मानवीय मूल्य वे नैतिक एवं सामाजिक गुण हैं जो व्यक्ति को एक अच्छा नागरिक और संवेदनशील इंसान बनाते हैं। सत्यनिष्ठा, ईमानदारी, करुणा, सहिष्णुता, सहयोग, सम्मान, उत्तरदायित्व तथा नैतिकता जैसे गुण मानवीय मूल्यों के प्रमुख आधार हैं। ये मूल्य न केवल व्यक्ति के चरित्र का निर्माण करते हैं, बल्कि समाज में शांति, सद्भाव और विश्वास की स्थापना भी करते हैं।

डिजिटल युग में जहाँ सूचना का प्रवाह अत्यंत तीव्र है, वहीं सही और गलत के बीच अंतर करना भी चुनौतीपूर्ण हो गया है। ऐसे में मानवीय मूल्य व्यक्ति को विवेकपूर्ण निर्णय लेने की प्रेरणा देते हैं।

डिजिटल युग की चुनौतियाँ

डिजिटल तकनीक ने अनेक सुविधाएँ प्रदान की हैं, परंतु इसके कुछ नकारात्मक प्रभाव भी सामने आए हैं। सोशल मीडिया पर झूठी खबरों का प्रसार, साइबर अपराध, ऑनलाइन धोखाधड़ी, व्यक्तिगत गोपनीयता का उल्लंघन तथा डिजिटल लत जैसी समस्याएँ समाज के लिए चिंता का विषय बन चुकी हैं।

आज लोग आभासी दुनिया में अधिक समय बिताने लगे हैं, जिसके कारण पारिवारिक

एवं सामाजिक संबंधों में टूरी बढ़ रही है। कई बार ऑनलाइन संवाद में शिष्टाचार और संवेदनशीलता का अभाव देखने को मिलता है। ट्रोलिंग, साइबर बुलिंग तथा घृणास्पद टिप्पणियाँ मानवता और सामाजिक सौहार्द को प्रभावित करती हैं। ऐसी परिस्थितियों में मानवीय मूल्यों का पालन अत्यंत आवश्यक हो जाता है।

डिजिटल नैतिकता और मानवीय मूल्य

डिजिटल युग में तकनीकी दक्षता के साथ-साथ डिजिटल नैतिकता का ज्ञान भी आवश्यक है। डिजिटल नैतिकता का अर्थ है कि व्यक्ति इंटरनेट और तकनीकी साधनों का उपयोग जिम्मेदारी, ईमानदारी और सम्मान के साथ करे। किसी की निजी जानकारी का दुरुपयोग न करना, कॉपीराइट का सम्मान करना, ऑनलाइन व्यवहार में मर्यादा बनाए रखना तथा सत्यापित जानकारी साझा करना डिजिटल नैतिकता के महत्वपूर्ण पहलू हैं।

मानवीय मूल्य हमें यह सिखाते हैं कि तकनीक का उपयोग केवल व्यक्तिगत लाभ के लिए नहीं, बल्कि समाज और मानवता के कल्याण के लिए भी किया जाना चाहिए। यदि तकनीकी प्रगति के साथ नैतिक मूल्यों का समन्वय हो जाए, तो डिजिटल युग मानव विकास का सशक्त माध्यम बन सकता है।

शिक्षा और मानवीय मूल्यों की भूमिका

डिजिटल युग में शिक्षा संस्थानों की जिम्मेदारी बढ़ गई है। विद्यार्थियों को केवल तकनीकी ज्ञान प्रदान करना पर्याप्त नहीं है, बल्कि उनमें नैतिकता, सामाजिक उत्तरदायित्व और मानवीय संवेदनाओं का विकास भी आवश्यक है। शिक्षकों और अभिभावकों को बच्चों को यह समझाना चाहिए कि डिजिटल माध्यमों का उपयोग सकारात्मक उद्देश्यों के लिए कैसे किया जाए।

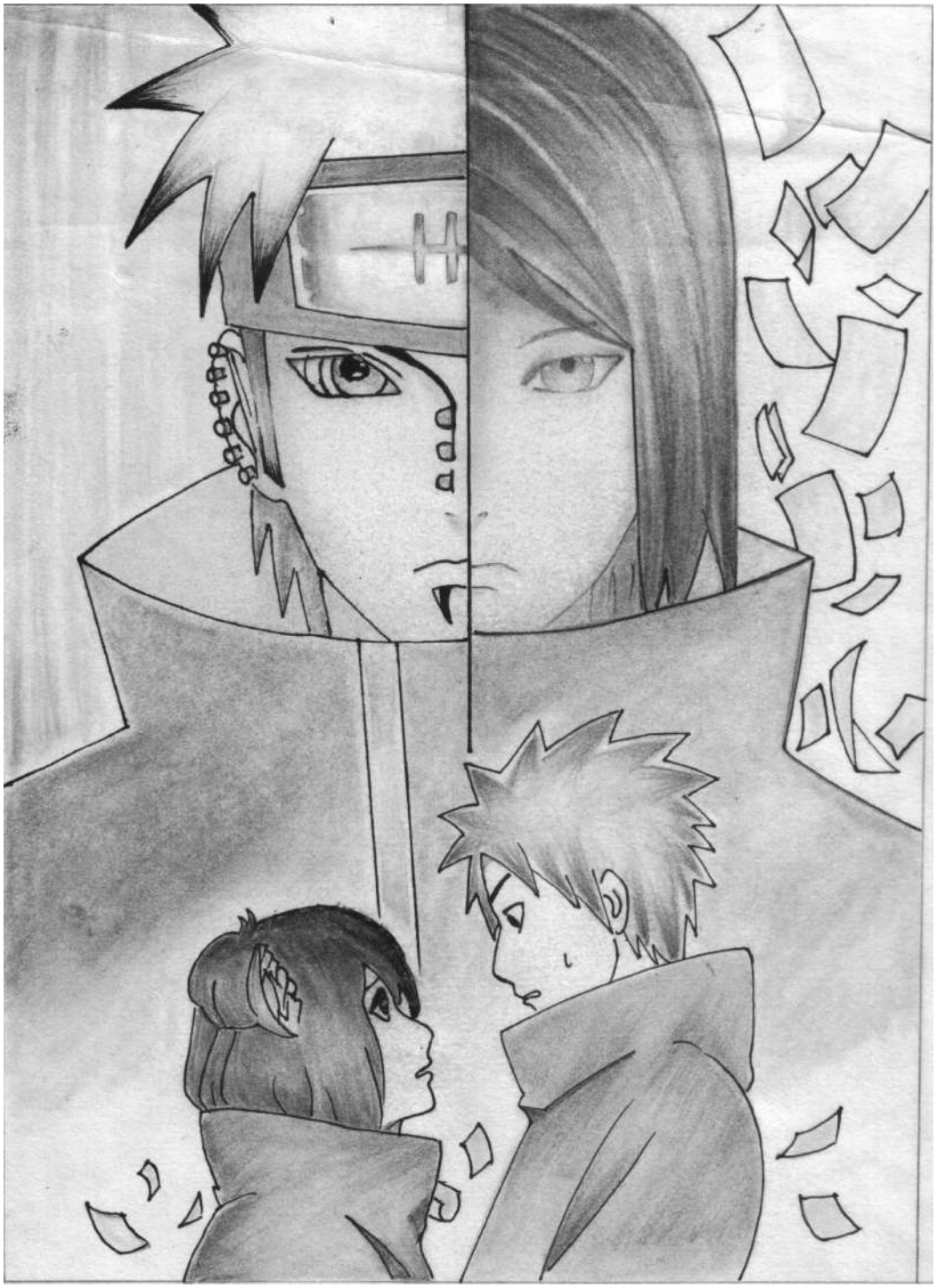
मूल्यपरक शिक्षा विद्यार्थियों को जिम्मेदार डिजिटल नागरिक बनने में सहायता करती है। इससे वे तकनीक का उपयोग रचनात्मक कार्यों, ज्ञानार्जन और सामाजिक विकास के लिए कर सकते हैं।

निष्कर्ष

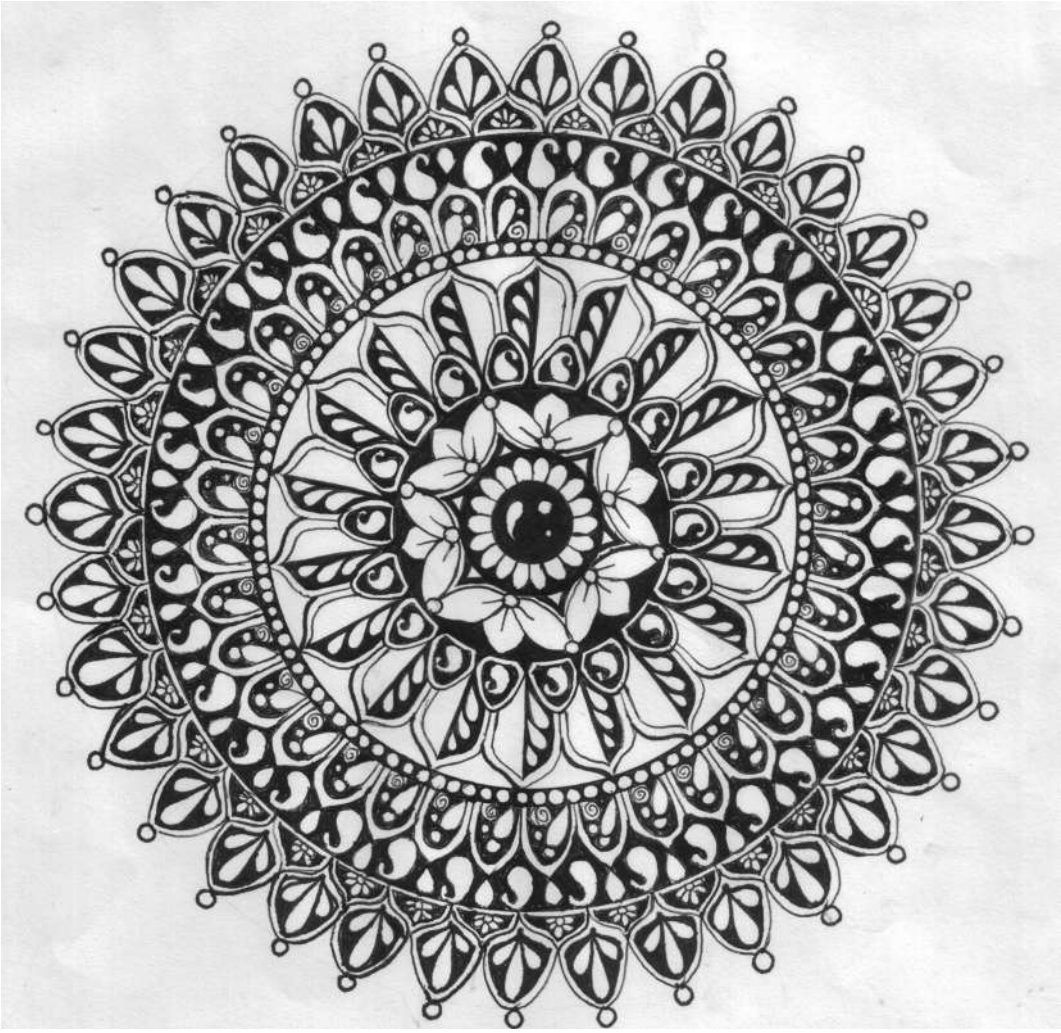
डिजिटल युग ने मानव जीवन को नई दिशा और गति प्रदान की है। यह विकास और नवाचार का युग है, कितु तकनीकी उन्नति तभी सार्थक होगी जब उसके साथ मानवीय मूल्यों का संरक्षण और संवर्धन भी किया जाए। तकनीक मानव की सेवक होनी चाहिए, स्वामी नहीं। यदि हम ईमानदारी, करुणा, सम्मान, सहयोग और उत्तरदायित्व जैसे मूल्यों को अपने डिजिटल व्यवहार में अपनाएँ, तो डिजिटल युग मानवता के लिए अधिक उपयोगी, सुरक्षित और समृद्ध बन सकता है।

अतः यह आवश्यक है।कि हम तकनीकी प्रगति और मानवीय मूल्यों के बच सतत तुलन स्थापित करें। यही संतुलन एक सशक्त नैतिक और मानवीय समाज के निर्माण की है।

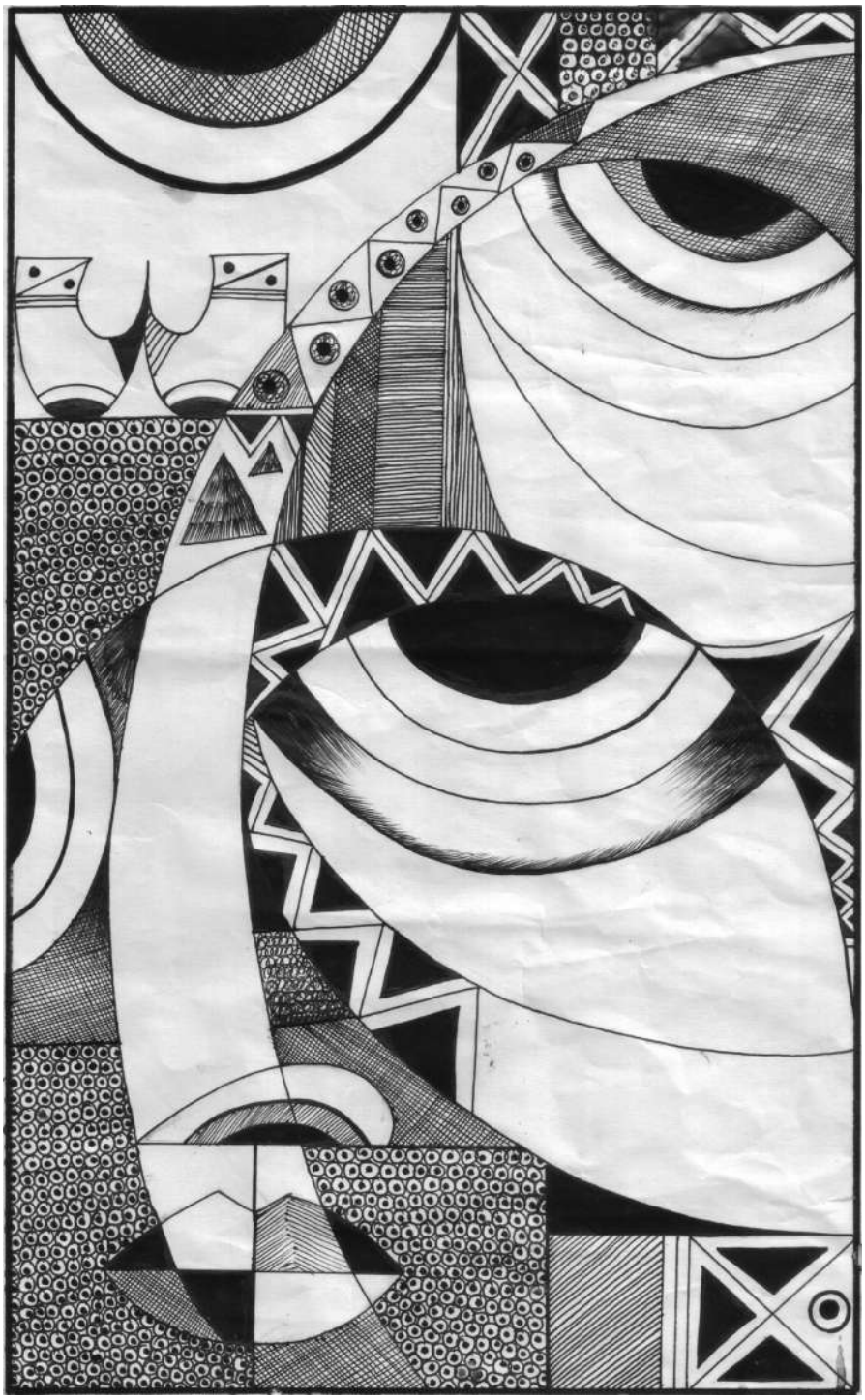
Sneha Bera
(CSE/25/232)



Anirban Pradhan
(CSE/24/011)



Ankita Kala
(CSE/25/230)



Palak Singh
(AIML/24/30)

Ritwika Kar
(CSE/24/066)

Sreejan Das
(ECE/23/16)

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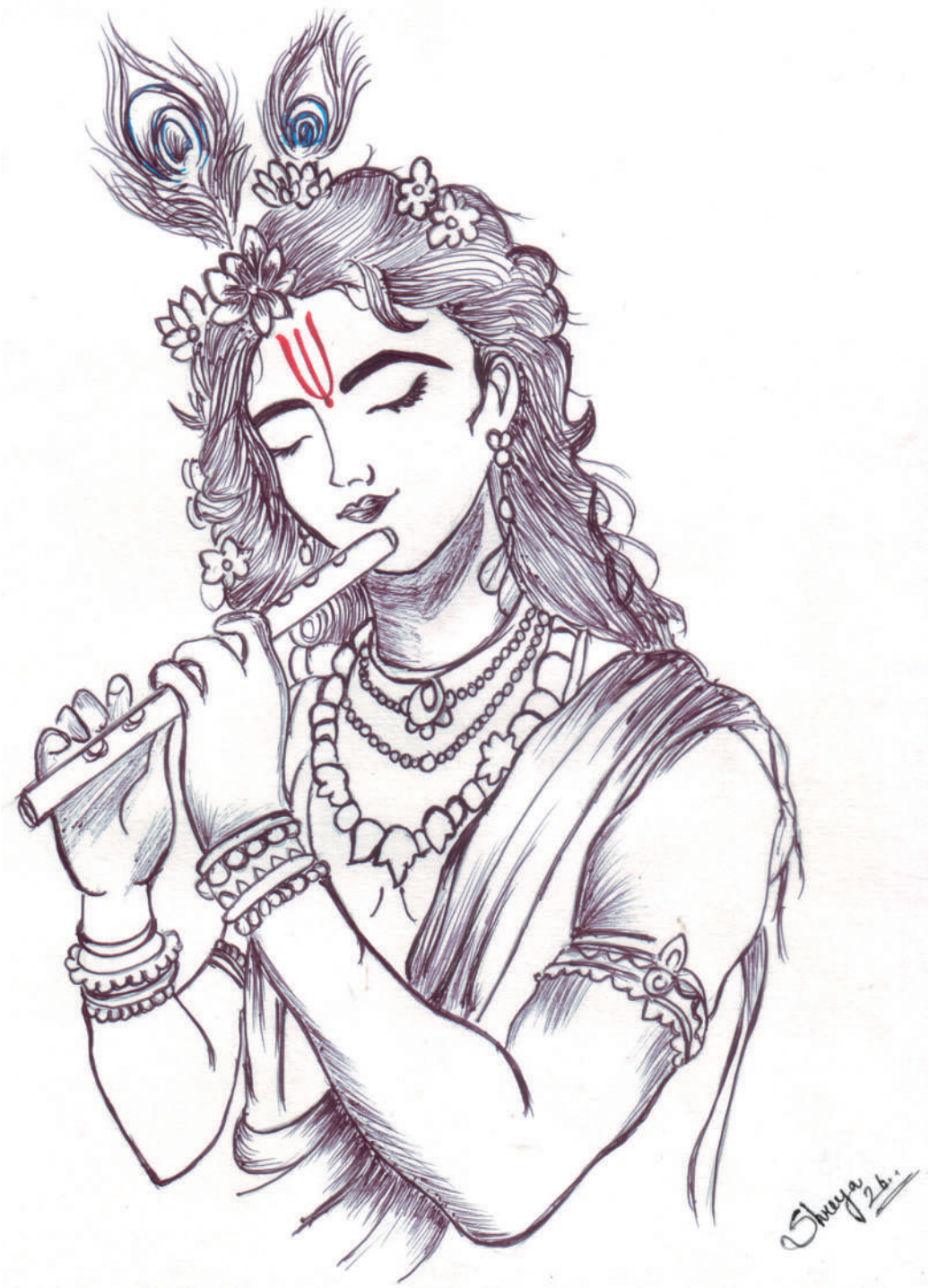
(AIML/24/100)



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(IT/23/25)

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Assistant Professor, CSE

Soumyajit Dhal
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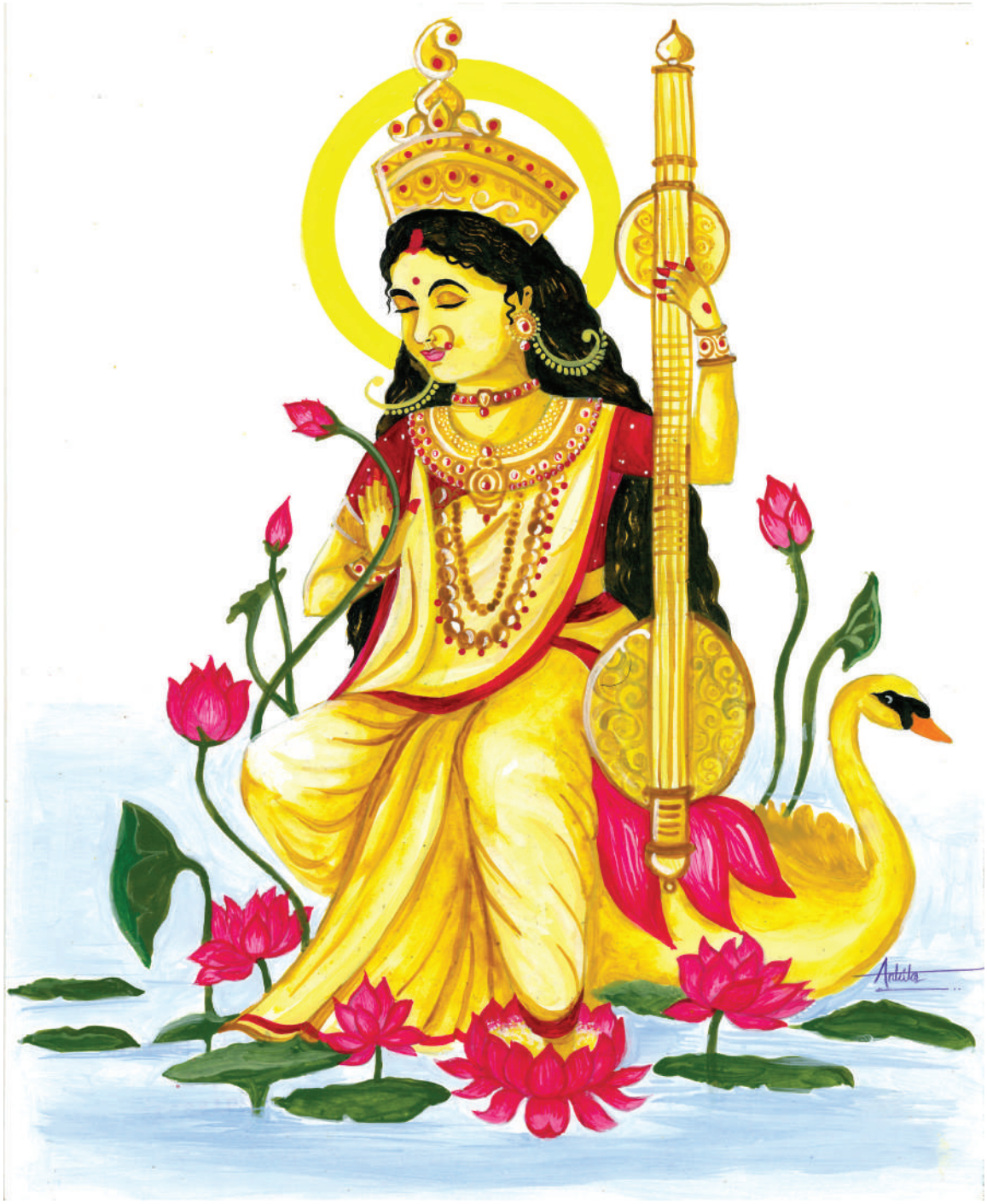

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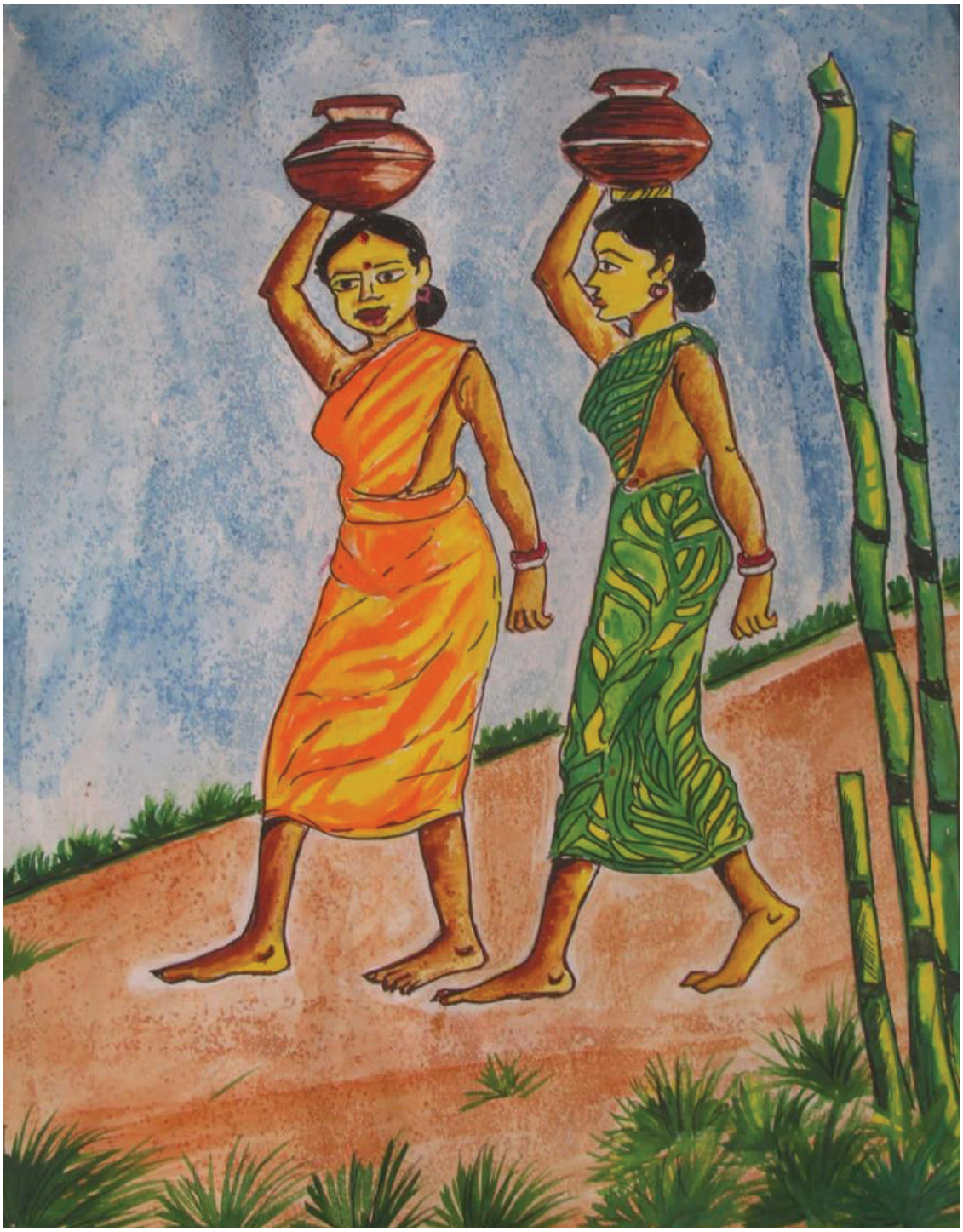
(AIML/24/003)



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Parthib Das
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Chinmoy Goswami
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CSE/24/022

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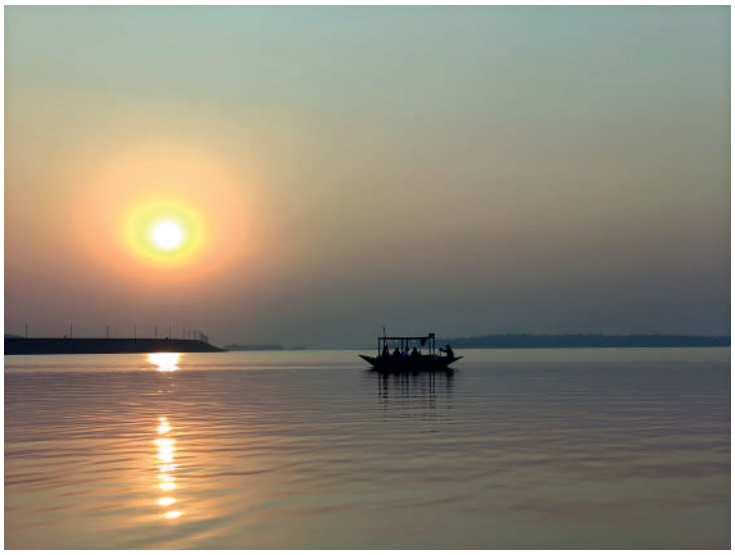
CSE/23/038

Koustuv Maity
CSE/23/178

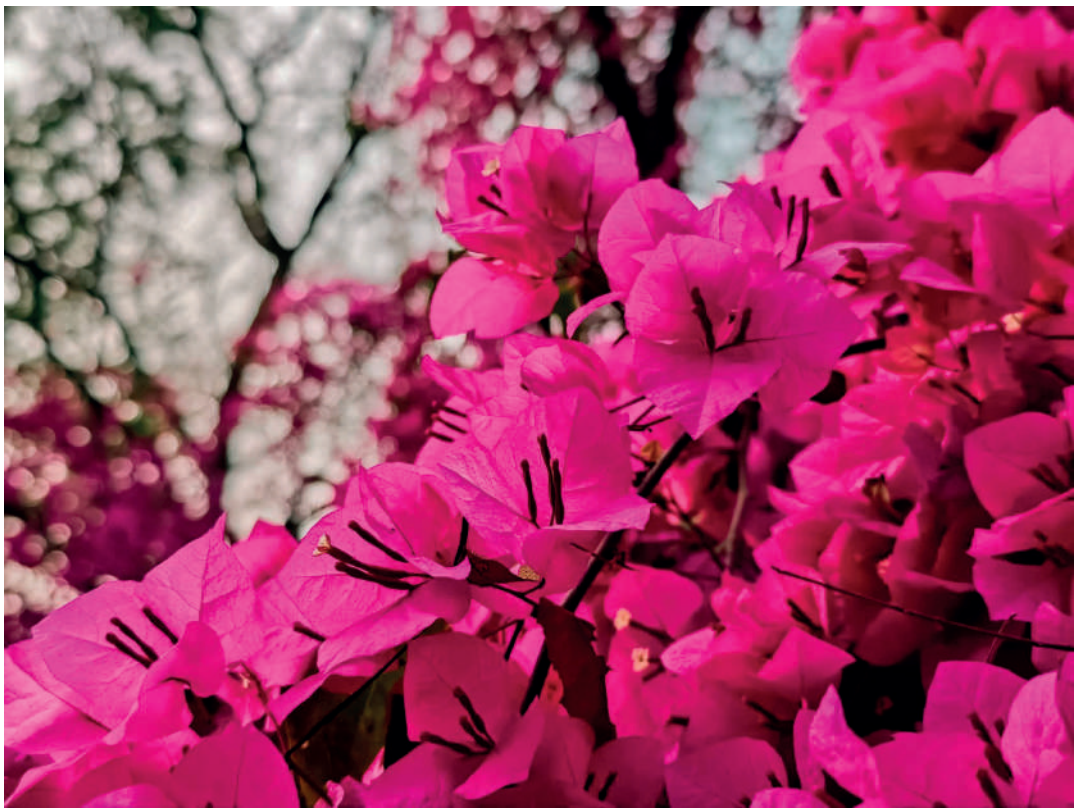
Sastika Majumdar
AIML/24/014

Suman Kalyan Bera
CSE/25/141



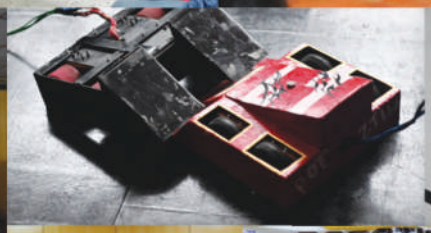
Sammer Islam
CSE/23/095

Suman Banerjee
IT/22/22



Shubadeep Patra
ME/24/01

BLOOD DONATION CAMP
NSS UNIT Activities



ROBOTICS
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LINE FOLLOWER
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EGE OF ENGINEERING AND MANAGEMENT KOLAGHAT

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