

Volume 4 Issue 1

WE VOLTE

THE PULSE OF MODERN ENGINEERING



By Editorial Board
Rajkiya Engineering College, Ambedkar Nagar

Magazine of Electrical Engineering Department

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Electrical Department Magazine

A MEMORANDUM FROM EDITORIAL BOARD

As engineers, we are trained to seek the Maximum Power Point in every system we design. While previous years were about finding our rhythm, the 2025-26 batch has reached a steady state of innovation. Just as a circuit achieves resonance, our department has synchronized its academic rigor with groundbreaking research and practical application. This volume of "We VoLTE" is no longer just a highlight reel

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The successful execution of this volume was made possible by the unwavering support and technical mentorship of the Electrical Engineering Department faculty members. We extend our deepest gratitude to our mentors, especially **Dr. Mohammed Aslam Husain**, whose consistent direction in our research endeavors and ability to troubleshoot our creative "faults" have been the bedrock of this project.

OUR TEAM

FACULTY COORDINATOR AND THE EDITORIAL CONVENER: Dr. MOHAMMED ASLAM HUSAIN

EDITORIAL STUDENT COORDINATOR: KUSHAGRA KAUSHIK, KAVYA SHARMA

Department at a glance

ELECTRICAL ENGINEERING DEPARTMENT



Microprocessor Lab



Network Lab



Departmental computer lab



Power System Lab



Communication Lab



Electronics Lab



Electrical Workshop Lab



Instrumentation Lab



Electrical Measurement Lab



Electric Drives Lab



Microprocessor Lab



Network Lab



Power Electronics Lab



Power System Lab



Renewable Energy Lab

WE VOLTE



Rajkiya Engineering College

Ambedkar Nagar Uttar Pradesh



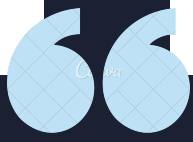
DEPARTMENT OF ELECTRICAL ENGINEERING

VISION

- *To impart knowledge in Electrical Engineering by upbringing globally competent engineers, innovators and entrepreneurs instilled with the human values and professional ethics.*

MISSION

- *To offer good quality education & research in Electrical Engineering.*
- *To provide the knowledge base and consultancy services to the rural and weaker section of the society for their upliftment and well-being.*
- *To bridge the gap between industry and academia by framing curriculum and syllabus based on industrial and societal*



Message from Head of Department

It is a moment of immense pride and satisfaction to present the 2025-2026 edition of WE VOLTE. As we navigate an era of unprecedented energy transition, our department remains committed to being at the heart of innovation—bridging the gap between traditional power systems and the burgeoning world of Smart Grids, Green Energy, and AI-driven automation.

Our vision has always been to produce globally competent engineers who are not only technically proficient but also ethically grounded. This past year, we have seen our students and faculty push the boundaries of research in areas like Renewable Energy Integration and Predictive Maintenance, ensuring that our academic output meets the pressing societal and industrial needs of today.

Warm regards,

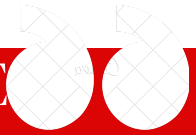
Dr.SP Singh

HoD

(Department Of Electrical
Engineering)



FACULTY COORDINATOR AND THE EDITORIAL CONVENER



Hello Students,

It is a pleasure to welcome you to the 2025-26 edition of WE VOLTE, the official magazine of the Department of Electrical Engineering. As the Convener of this publication, I have had the distinct privilege of witnessing the immense creative and intellectual energy our students have poured into these pages.

In an era where the electrical engineering landscape is rapidly shifting toward Smart Grids, Sustainable Energy, and AI-integrated systems, it is more important than ever to have a platform that captures these transitions. This magazine serves as that vital bridge—blending academic rigor with the innovative spirit of our student body.

The articles, research highlights, and creative contributions found within this edition are a testament to our department's commitment to excellence.

I would like to extend my heartfelt gratitude to the editorial team, our faculty mentors, and the Head of Department for their unwavering support in making this vision a reality. Most importantly, I thank our students for their relentless pursuit of knowledge and their willingness to share their insights with the community.



**Dr. Mohammed
Aslam Husain**

FACULTY COORDINATOR
AND THE EDITORIAL
CONVENER
&
ASSISTANT PROFESSOR



OUR DEPARTMENT FACULTY



Dr.SP Singh

Associate Proffesor (Regular)

Head of the department EE

Qualifications: B.E., M.Tech.(MNNIT, Allahabad), Ph.D. (MNNIT, Allahabad)



Dr. Yudhishtir Pandey

Assistant Proffesor (Regular)

Qualifications: B.E, M.Tech (IIT Delhi),
Ph.D. (Jamia Millia Islamia New Delhi)



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Assistant Proffesor (Regular)

Qualifications: Ph.D. (IIT Roorkee), M.Tech.
from AMU , B. Tech. from AMU



Mr. Sonu Kumar

Assistant Proffesor (Regular)

Qualificatio: B.Tech, M.Tech
(NIT Hamirpur)



Dr. Mohammed Aslam Husain

Assistant Professor (Regular)

Qualifications: Ph.D.(AMU), M.Tech.
(AMU), B.Tech (AMU)



Dr. Lokesh Kumar Yadav

Assistant Professor (Regular)

Qualifications: M.Tech (NIT Patna), Ph.D.
(IIT BHU)



Dr. Sanjay Agrawal

Assistant Professor (Regular)

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M.Tech(NIT Hamirpur), B.Tech (UCER
Allahabad)



Dr. Vikas Patel (On deputation at AKTU,LKO)

Assistant Professor (Regular)

Qualifications: M.Tech (MMMUT
Gorakhpur), Ph.D. (Pursuing)



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Assistant Professor (Guest Faculty)
Qualifications: M. Tech (GBU, Greater Noida)



Mr. Arun Kumar Verma

Assistant Professor (Guest Faculty)
Qualifications: M. Tech (KNIT, Sultanpur, UP)



Mr. Divya Prakash

Assistant Professor (Guest Faculty)
Qualifications: M. Tech (SHIATS, Prayagraj, UP)



Mr. Jai Prakash Lal

Assistant Professor (Guest Faculty)
Qualifications: M. Tech (UPTU, Lucknow)

PRESENTING

**SYNERGIZING INNOVATION:
THE RESEARCH GRID
BEYOND THE CIRCUIT:
PROJECTS OF THE 2025-26
BATCH**

By:Kushagra Kaushik & Kavya Sharma

"Where Equations Transform into Solutions."

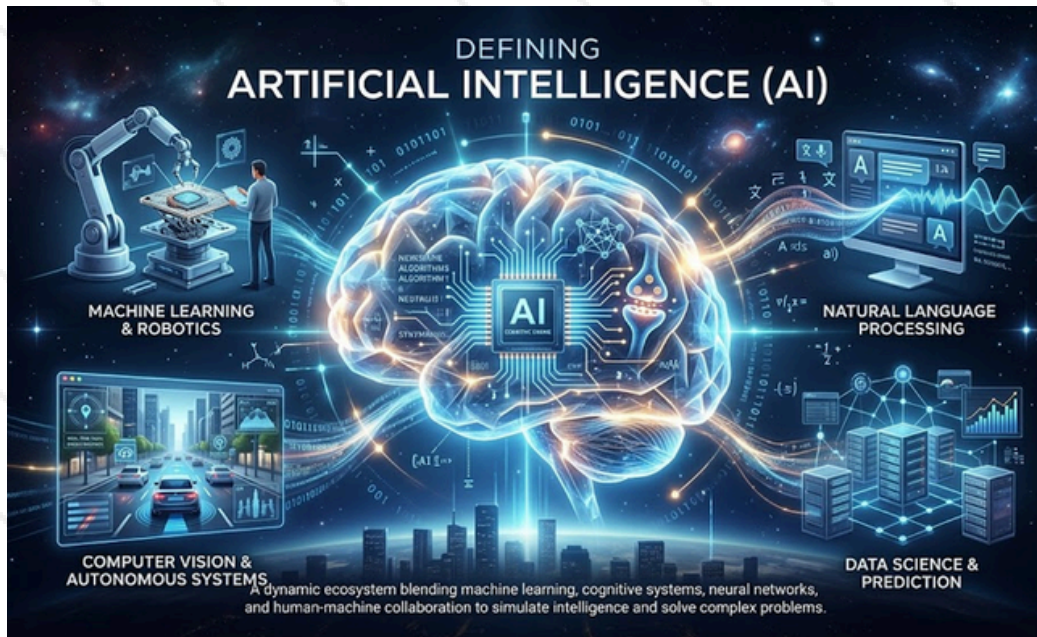
We VoLTE

creative collection

AI-Driven Predictive Maintenance for Smart Grid Infrastructure

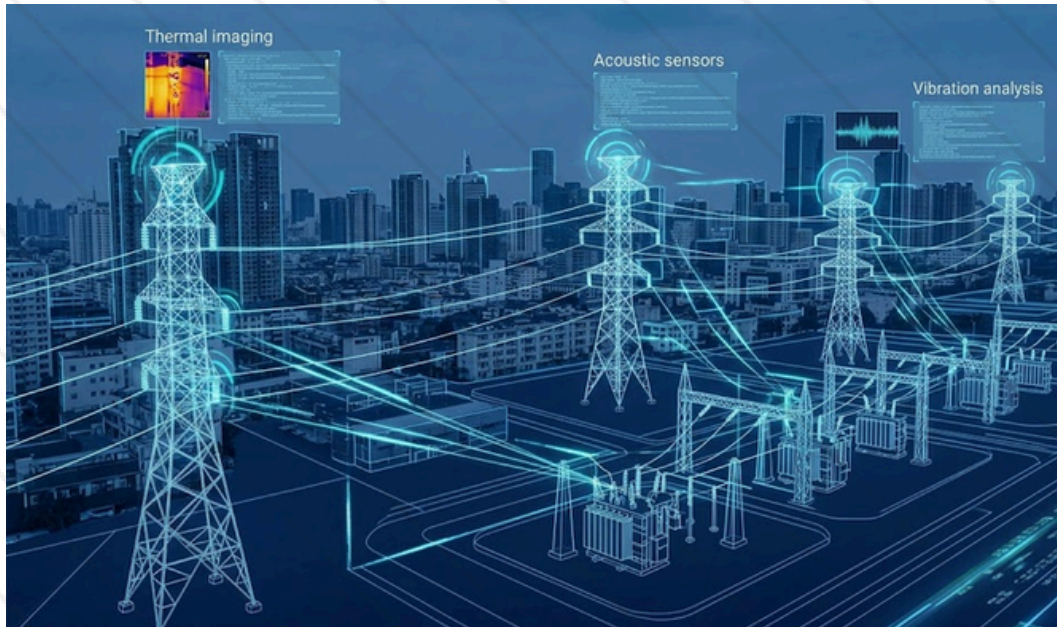
By: Kushagra Kaushik
EE 2ND YEAR

- Artificial Intelligence (AI) has emerged as the defining technology, transforming PdM from a reactive science to a proactive art. This report explores how AI is revolutionizing how we maintain the very backbone of our modern world.



- The modern electrical grid is a sprawling, aging, and increasingly complex entity. Traditional "run-to-failure" maintenance strategies are no longer sustainable, leading to costly blackouts, extensive repairs, and safety hazards. Predictive maintenance (PdM) leverages data and advanced analytics to predict when equipment might fail, allowing for pre-emptive intervention.
- **Phase 1: The Sensor Revolution – Harvesting Real-Time Vital Signs**
- AI is only as good as the data it receives. The first phase in an AI-driven PdM system is transforming ancient metal and glass infrastructure into intelligent data generators.

- This image visualizes the intricate web of multispectral sensors deployed across critical grid components, such as high-voltage transmission towers and substations. These "digital nervous systems" constantly monitor parameters far beyond human perception: temperature gradients (thermal imaging), acoustic signatures (listening for micro-arcs

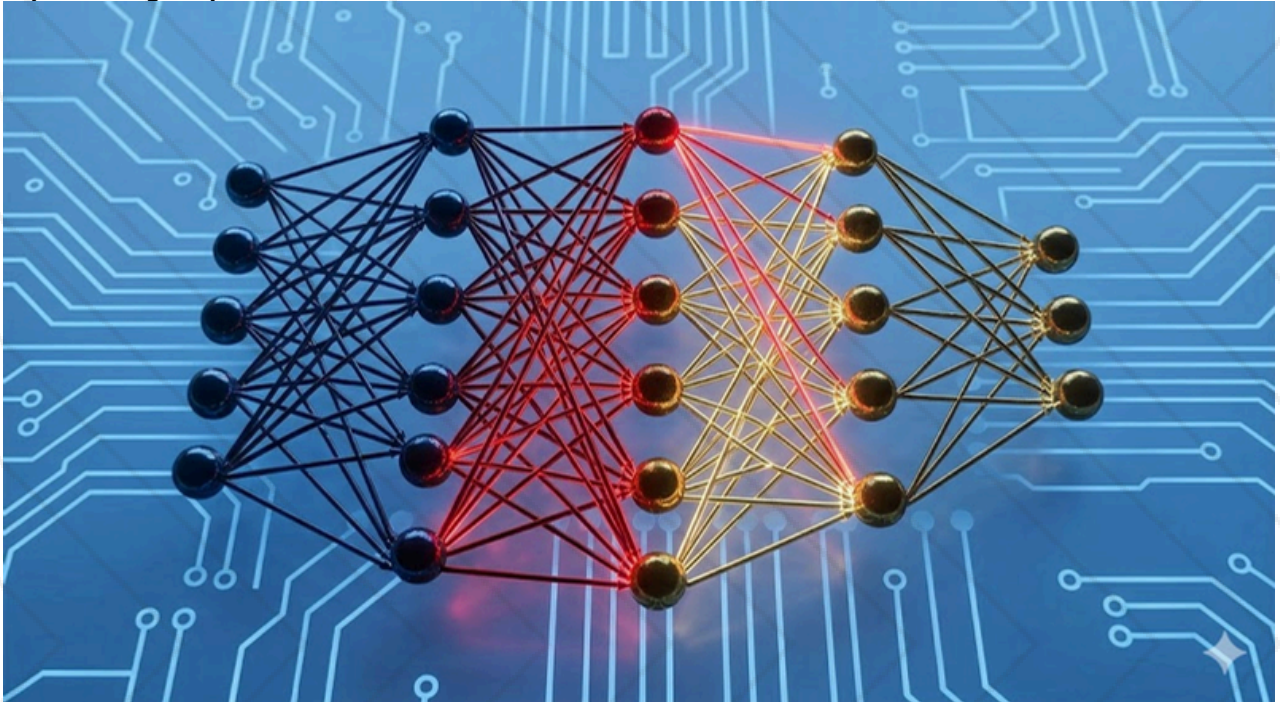


- The infrastructure itself is now an instrument. We see a futuristic blueprint of multispectral sensors—thermal, acoustic, and vibration—deployed across the cityscape’s critical points (transmission towers, substations), visualized by pulsing light blue data streams. This network harvests the raw environmental intelligence.

Phase 2: Neural Diagnostics – The AI Analytically ‘Sees’ Failure

- Once massive data streams are ingested, the AI must process this information, distinguishing normal operational noise from the subtle anomalies that precede a fault. This is where specialized Deep Learning models, such as Convolutional Neural Networks (CNNs), excel.

- The second image takes us inside the neural network's decision matrix. Instead of visualizing the physical sensor, we see the data's path through the algorithm. The AI is analyzing time-series data from an Image 1 acoustic sensor. The image shows the input acoustic waveform and, in a corresponding visualization, precisely how the deep learning layers interpret specific frequency spikes.



- **Image 2 Description:** Inside the Neural Diagnostic Engine. A visualization of a deep learning architecture. Complex matrices process the sensor data streams first seen in Image 1. We see a specific neural pathway (the specific layers highlighted in red and gold) isolating a tiny, abnormal acoustic spike. The system instantly classifies this signature, generated by a substation sensor originally visualized in Image 1, as 'Inter-turn Insulation Wear' inside a localized transformer.
- The ultimate goal is actionable intelligence. When the neural diagnostic engine (Image 2) identifies a high-probability fault, the system must generate a resolution plan that is both resource-efficient and safe.

- **The final image** visualizes the decision matrix translating into proactive real-world action. The scene is split: on the left, an augmented reality dashboard shows the 'Health Score' of the critical transformer identified in Image 2. The AI has predicted a 92% probability of failure within 14 days and has autonomously generated an optimized maintenance schedule. On the right, we see the execution. A utility repair crew, wearing AR-equipped helmets, is performing targeted insulation replacement. The AR display (derived from the precise fault location in Image 2) highlights the exact internal component needing service, overlaid on the physical equipment.



- **Image 3 Description:** Optimized Intervention and the AR Repair. The cycle is complete. A repair crew utilizes an augmented reality (AR) interface (the operator's glasses glowing gold, referencing the failure path analyzed in Image 2) to maintain a component in a high-voltage tower originally networked in Image 1. The AR display highlights the exact internal insulation needing repair, guided by the precision diagnosis derived in Image 2.

WORKSHOP EVES-2026 (Electric Vehicles and Environmental Sustainability)

By:Kushagra Kaushik
&
Kavya Sharma
(EE 2ND YEAR)

- The one-week Short Term Course (EVES-2026), organized by Rajkiya Engineering College, Ambedkar Nagar (Feb 16–20, 2026), focused on electric vehicles (EVs) and their role in sustainable development. It provided insights into EV technologies, environmental challenges, and future mobility trends through expert sessions.

Key Topics Covered:

- **Global Energy & Sustainability:** Highlighted issues like fossil fuel dependence, carbon emissions, and climate change, emphasizing renewable energy and policy support for clean transitions.
- **EV Design & Powertrain:** Explained EV components such as batteries, chassis, and drivetrains, including different configurations for efficient energy use.
- **Motors & Drives:** Covered types of electric motors, their performance characteristics, and their role in reliable and efficient EV operation.

- **Battery Technologies:** Discussed lithium-ion, solid-state, and emerging batteries, focusing on capacity, cost, safety, and charging challenges.



- **Battery Recycling:** Emphasized recovery of valuable materials and sustainable recycling methods to support a circular economy.
- **Renewable Integration:** Explored EV systems powered by solar and wind energy, along with technologies like microgrids and bidirectional charging.
- **AI & Machine Learning:** Highlighted applications such as predictive maintenance, route optimization, and autonomous driving.
- **Future Trends:** Focused on autonomous EVs, connected mobility, AI integration, and challenges like cybersecurity.

Article on IoT-Based Smart Energy Meter

By:Kavya Sharma
EE 2NDYEAR

Abstract:

The increasing demand for electricity and the need for efficient energy management have led to the development of smart metering systems. This paper presents an IoT-based smart energy meter that enables real-time monitoring and control of electricity consumption. The proposed system uses embedded devices, sensors, and cloud platforms to transmit energy usage data to users and utility providers. It eliminates manual meter reading, reduces human error, and enhances energy efficiency.

Keywords: IoT, Smart Meter, Energy Monitoring, Arduino, Cloud Computing, Smart Grid.



Introduction: Electricity consumption is increasing rapidly due to industrialization and urbanization. Traditional energy meters require manual reading, which is time-consuming and prone to errors. IoT technology provides a smart solution by enabling automated monitoring and control of energy usage.

IoT-based smart energy meters allow real-time data collection, remote monitoring, and efficient power management. These systems help reduce energy wastage and improve billing accuracy.



1. Hardware Components

(Arduino / ESP8266 / Raspberry Pi)

Current and Voltage Sensors

Energy Metering IC

Wi-Fi Module

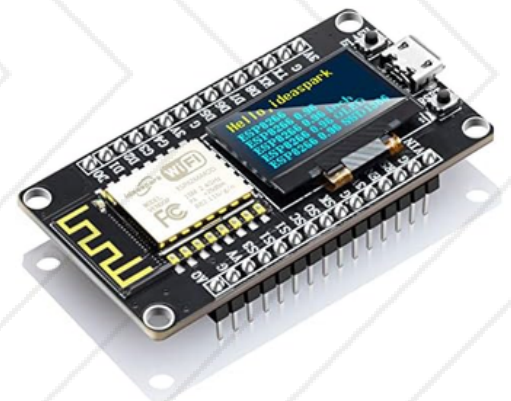
Relay (for load control).

2. Software Components

Cloud Platform (ThingSpeak, MQTT)

Mobile/Web Application

Database for data storage.



3. Working Principle

The system measures voltage and current using sensors. The microcontroller calculates power consumption and sends the data to a cloud server via IoT modules. Users can access real-time data through mobile or web applications.

4. Methodology

Measure electrical parameters (Voltage, Current)

Calculate power and energy consumption.

Transmit data using IoT protocol (Wi-Fi/MQTT).

5. Features of Proposed System:

Real-time monitoring of energy usage

Remote access through mobile app.

Automatic billing system

Theft detection mechanism

Load control and power management.

Smart meters can also report events like outages and tampering instantly, improving grid reliability.

6. Applications:

Residential energy monitoring

Industrial power management

Smart homes and buildings

Smart grid systems



Conclusion:

IoT-based smart energy meters are a crucial step toward efficient energy management and smart grid implementation. They provide real-time monitoring, improve efficiency, and reduce operational costs.

Externally Funded Research Project in The Department

1. **Title of the Project:** “Design and Development of power grid Stability pipeline machine mechanism to make Pradhan Mantri Surya Ghar: Muft Bijli Yojana initiative more versatile”.

2. **Funding Agency:** Council of Science and Technology, Uttar Pradesh

3. **Budget:** 7.72 lakhs

4. **Tenure:** Two (2) years from commencement (08/10/2024 to 07/10/2026).

5. Name Of Investegators:

- **Principal Investegator:** **Dr Mohammed Aslam Husain**, Department of Electrical Engineering, Rajkiya Engineering College Ambedkar, 224122, Uttar Pradesh
- **CO- Principal Investegator:** **Dr. Yudhishtir Pandey**, Department of Electrical Engineering, Rajkiya Engineering College Ambedkar, 224122, Uttar Pradesh
- **CO- Principal Investegator:** Dr. Asif Khan (Co-PI), Department of Computer Application, Integral University, Uttar Pradesh.
- **CO- Principal Investegator:** Dr. Alka Agrawal (Co-PI), Department of Information Technology, BBAU, Lucknow, Uttar Pradesh.

6. Name of Research Asstt./Technical personnel employed:

- Rishabh Mishra (From: 08/10/2024, To: 30/04/2025)
- **Subham Pandey** (From: 21/07/2025)

7. Publications :

- **Journal:** Energy Sources, Part A: Recovery, Utilization, and Environmental Effects UESO
- **Article:** Quantile Calibrated Ensemble Deep Learning Framework for Daily Global Horizontal Irradiance Forecasting

Conference Papers: "Optimal Dispatch Strategy for Roof Top Solar PV-Based EV Charging Stations." In 2025 10th International Conference on Signal Processing and Communication(ICSC), pp. 494-499. IEEE, 2025.



AKTU BEST TEACHER AWARD

Honoring Excellence:

Dr. Mohammed Aslam Husain

The Department of Electrical Engineering celebrates the remarkable achievement of Dr. Mohammed Aslam Husain for receiving the Best Teacher Award 2025 from AKTU.

His commitment to fostering a culture of research and technical brilliance has not only elevated our department but has also set a benchmark for pedagogical excellence.



**Dr. Mohammed
Aslam Husain**

FACULTY COORDINATOR
AND THE EDITORIAL
CONVENER
&
ASSISTANT PROFESSOR

THE EDITORIAL COMMITTEE

"This publication would not have been possible without the tireless dedication of our Editorial Committee. Their commitment to deep research and technical accuracy has transformed a collection of ideas into the comprehensive resource you hold today.

FACULTY COORDINATOR AND THE EDITORIAL CONVENER

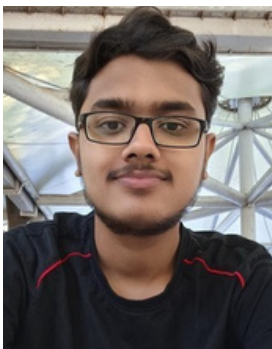


**Dr.
Mohammed
Aslam Husain**

(Assistant Professor, Dept. of EE)

A "Execution is nothing without the research to back it up. We owe a massive debt of gratitude to our Editorial Committee for their exhaustive research and editorial precision.

EDITORIAL STUDENT COORDINATOR



Kushagra Kaushik

Btech EE 2nd year



Kavya Sharma

Btech EE 2nd year

The Riddle Corner

I have cities, but no houses. I have mountains, but no trees. I have water, but no fish. What am I?

The more of this there is, the less you see. What is it?

I am always in front of you but can't be seen. What am I?

What breaks yet never falls, and what falls yet never breaks?

What goes up but never comes down?

What is so fragile that saying its name breaks it?

What has a neck but no head?

Your Answers Are Highly
Appriciated On :
rec.editorialboard@gmail.com
Top Three Will Be Awarded By
Certificate