



**GOVERNMENT OF INDIA**  
**DEPARTMENT OF ATOMIC ENERGY**  
**36<sup>th</sup> DAE ALL INDIA ESSAY CONTEST**  
**ON NUCLEAR SCIENCE & TECHNOLOGY**



सत्यमेव जयते

**DAE Platinum Jubilee Year**

<b>PRIZES TO BE WON!</b>	<b>1<sup>ST</sup></b>	<b>₹ 25,000/-</b>	<b>2<sup>ND</sup></b>	<b>₹ 20,000/-</b>	<b>3<sup>RD</sup></b>	<b>₹ 15,000/-</b>	<b>₹ 7,000/-</b>
	<b>First Prize (3 nos.)</b> (One for each topic)		<b>Second Prize (3 nos.)</b> (One for each topic)		<b>Third Prize (3 nos.)</b> (One for each topic)		<b>* Consolation</b> * To the remaining 21 participants who make oral presentation but do not secure First, Second or Third prize.

The Department of Atomic Energy (DAE) hereby invites students to participate in the “36<sup>th</sup> DAE All India Essay Contest on Nuclear Science & Technology”. DAE has been conducting the Essay Contest for the last 35 years which comprises of a written essay and an oral presentation before a panel of judges at DAE, Mumbai. It has been decided to conduct the essay contest by inviting the essays online and later calling the shortlisted students (based on their rankings) to appear for an oral presentation (in person) at Mumbai.

**WHO CAN PARTICIPATE?**

- Regular full time students doing graduation in India (after 10+2), in any discipline, in an Indian University.
- Engineering/Medical/IIT students etc. if studying in their 4<sup>th</sup> year are also eligible.
- Students who have completed their graduation are not eligible to participate in this contest. However, students who have appeared for their final year exam and are awaiting results (the results should not have been announced before 29<sup>th</sup> August 2024) can participate in the contest.
- Essays on any one of the topics (A, B & C) given below can be chosen and it should be submitted by a single author only.
- A participant should submit clear handwritten essay (scanned and saved as PDF file) on only one topic which should be sent to [36essaycontest@dae.gov.in](mailto:36essaycontest@dae.gov.in)

**ESSAY STRUCTURE**

The length of essay should not exceed 2000 words. Each essay should give brief introduction about the multifarious achievements of DAE in Basic Sciences and Nuclear Technology and their use for overall societal benefits in the country. It should comprise of an introduction (max. of 350 words), detailed essay (max. of 1500 words) and conclusion (max. of 150 words). Evaluation criteria to include originality, style, language.

**TOPIC-A Journey of Nuclear Power in India – past, present and future**

- Introduction** a) Discovery of nuclear fission and the world's first nuclear reactor b) India enters into nuclear age
- The beginning of nuclear power programme in India** a) Gaining experience with research reactors b) Technological developments - front end, back end, heavy water c) First power reactors become operational
- Current status of Indian Nuclear Power Programme** a) Pressurized Heavy Water Reactors (PHWRs) -PHWR technology, commissioning of first units, indigenization of PHWRs and capacity build-up b) VVERs c) Fast reactors – FBTR and PFBR
- Future reactor technologies** a) Small Modular Reactors (SMRs), High Temperature Reactors (HTRs), Molten Salt Reactors (MSRs)
- Conclusion.**

**TOPIC-B Societal applications of Radioisotope and Radiation Technologies for Viksit Bharat**

- Brief introduction of radioisotopes** a) Characteristics b) Decay processes
- Radioisotope Production in** a) Nuclear reactor b) Medical cyclotrons
- Utility of radioisotopes in healthcare** a) Diagnostic applications of radiopharmaceuticals i) Imaging techniques (PET, SPECT) ii) Brain imaging iii) Heart imaging iv) Cancer / tumour imaging b) Therapeutic applications of radiopharmaceuticals i) Peptide receptor radionuclide therapy (PRRT) ii) Radio immunotherapy (RIT) c) Therapeutic application of radio nuclides as sealed sources i) Teletherapy ii) Brachytherapy
- Advances in radioisotopes and radiation applications in Industry** a) **S e a l e d Radioisotopes and X-rays Source applications** i) Conventional techniques in nucleonic gauging, gamma radiometry and industrial radiography ii) Advanced industrial imaging using computed tomography and process tomography b) **Radiotracer applications** i) Applications of radiotracer for troubleshooting and process & Optimisation in industries c) **Isotopes in water resources management** d) **Radiation Processing of material** i) Cross linking applications ii) Sewage sludge processing iii) Pollution control
- Radioisotope applications in agriculture and food technology** a) Food processing b) Crop Improvement
- Conclusion**

**TOPIC-C Importance of Laser, Plasma and Accelerator Technologies for a Self-Reliant India**

- Introduction to DAE and its multitude of activities**
- Introduction to the essay** a) Importance of Science and Technology in the overall growth of a nation in general b) Importance of Self Reliant for a Nation
- Laser Technology** a) Physics of light emission, absorption, stimulation emission, population inversion, laser cavity operation of a laser b) Unique properties of laser light c) Types of lasers and their unique features d) Importance of Laser Technology for self-reliance
- Plasma Technology** a) What is Plasma, the criterion for plasma, types of plasma b) Methods of generation of plasma c) Unique properties of Plasma d) Importance of Plasma for self-reliance
- Accelerators Technology** a) Introduction of Accelerators b) Types of Accelerators c) Unique properties of Accelerators d) Importance of Accelerators for self-reliance
- Conclusion and Future direction** a) Distinct advantage Laser, Plasma and Accelerator techniques for Self-Reliance b) Your own views about self-reliant India

**IMPORTANT INSTRUCTIONS**

**Please read the following instructions carefully before submission of essay:** 1. There are no charges for registration/participation. 2. It is open for all regular full time students doing graduation in India (after 10+2), in any discipline, in an Indian University or an Institute deemed to be a University. Students who have completed their graduation are not eligible to participate in this contest. However, students who have appeared for their final year exam and are awaiting results (the results should not have been announced before 29<sup>th</sup> August 2024) can participate in the contest. 3. Each student should submit **readable HANDWRITTEN ESSAY ONLY**, in any official Indian Language. A participant should submit only one essay on any one topic only. 4. The student should submit the **Clear Handwritten Essay Only, which should be scanned in a PDF file format**. The file name should be the student's **Aadhar No.** preceded with **A, B or C** as per **Topic** and as per the **FORMAT** given below. 5. Submission of two or more essays by any student or the same essay by different Aadhaar Nos. will lead to disqualification. 6. Please note that the essay must be original and should not violate any provision of the Indian Copyright Act, 1957. 7. Anyone found violating on others' copyright would be disqualified from the contest. Department of Atomic Energy does not bear any responsibility for copyright violations by any participants with respect to intellectual property. 8. Mention of the **authors/students name/emails**, etc. anywhere in the body of the essay will lead to disqualification. 9. Each student will have to send his/her essay (complete in all respect) to [36essaycontest@dae.gov.in](mailto:36essaycontest@dae.gov.in) with a subject as “**Submission of Essay**”. Essays submitted to any other **email id/medium/mode** would not be considered. 10. The Essay should be original. Copied entries will not be considered for the contest. 11. The participant must be the same person who has written the essay and plagiarism (copying of others essay) would not be accepted. 12. Each student shall have to submit scanned copy of their Aadhaar Card; PAN Card; Clear scanned copy of College Identity Card and a scanned copy of his/her Bank Details (such as Name; Account No.; Bank's Name; Branch name and address, IFSC Code etc.). In case, if the student does not have his/her bank account then, he/she can send his/her parents bank details and send the same to [36essaycontest@dae.gov.in](mailto:36essaycontest@dae.gov.in) by mentioning the subject as “**Personal Details**” as per topic and as per the **FORMAT** given below. 13. Each student should also fill in their above personal details in an Excel Sheet Template (attached) and it should be sent to [36essaycontest@dae.gov.in](mailto:36essaycontest@dae.gov.in) by mentioning the subject as “**My Excel Data**” as per Topic and as per the **FORMAT (do not change the format)** given below. 14. Students should make sure that their personal details are accurate and updated since this information will be used for further communication such as oral presentation etc. 15. As the above details are important and mandatory, non-submission of any of the above requirements will lead to disqualification. 16. **The last date of receipt of essays by email is 29<sup>th</sup> August 2024.** 17. All the submissions shall be the exclusive property of DAE. DAE can publish the contents of the submissions (edited/unedited) in journals/periodicals giving due credit to the participants. 18. In case of any difference of opinion or ambiguity with respect to any issue, the decision of the Organising Committee of the **36<sup>th</sup> DAE All India Essay Contest on Nuclear Science & Technology** shall be final and binding.

**FORMAT**

For example If a student is writing essay on Topic A and his / her Aadhaar Card No is 123456781234 then the file name of the various details such as Essay, Personal Details, My Excel Data etc. to be submitted by the student will be as shown in the opposite table.

(Follow the same Format for Topic B and Topic C by replacing alphabet A by B or C)

**Details to be submitted by the candidates**

**File Name**

<b>1</b>	<b>Essay</b>	<b>A_123456781234_Essay</b>
<b>2</b>	<b>Personal Details</b> I) Aadhaar Card II) PAN Card III) College ID Card IV) Bank Details	I) A_123456781234_Aadhaar Card II) A_123456781234_PAN Card III) A_123456781234_College ID Card IV) A_123456781234_Bank Details
<b>3</b>	<b>My Excel Data</b>	<b>A_123456781234_Excel Sheet</b>

**MODE OF SELECTION**

A maximum of **30 essays** will be selected and only these 30 shortlisted students will be informed and will be invited to Mumbai during the last week of **October 2024** for an oral presentation. Final selection will be made on the basis of both - performance in oral presentation and quality of the written essay. The decision of the judges will be final and no other correspondence in this matter will be entertained. Those called for oral presentation in Mumbai shall be eligible for: a) To and fro AC 3-Tier rail fare by the shortest route. Claim for reimbursement of rail fare for journey performed by Rajdhani/August Kranti/Shatabdi Express will be restricted to AC 3-Tier by ordinary Express/Mail train. b) Boarding and lodging in the Guest House of BARC at Anushaktinagar, Mumbai during the authorized period of stay.

**Selection/ Certificates/ Prize Money**

**30 selected** students for oral presentation (**approximately 10 from each topic**) will be announced on the DAE website and official social media channels of the Department. All winning essays will receive certificates and a Prize Money which will be credited directly to the student's (or his/her parents) Bank Account. There will be 3 First prizes of Rs. 25,000/- each, 3 Second prizes of Rs. 20,000/- each and 3 Third prizes of Rs. 15,000/- each and there will be 21 consolation prizes of Rs. 7,000/- each.

**Contact Details**

For queries related to Essay Contest, please contact at Land Line: **022-2286 2605**  
**022 2286 2504, 022 2286 2665**, or  
 email at: [aaopad@dae.gov.in](mailto:aaopad@dae.gov.in)

**The last date of receipt of Essays by email**  
**29<sup>th</sup> August 2024**