

IPR-NCSTC Joint 2-Day Training Programme “Awareness-Cum-Training Programme On Plasma Science & Technology and Energy from Nuclear Fusion”

Project Sanction No. CO/J/FP/G100/2015 Dated : 16-01-2017

Project Completion Report

Institute for Plasma Research

(An Autonomous Research Institute Under the Department of Atomic Energy, Government of India)

Bhat, Gandhinagar 382 428, Gujarat



प्लाज़्मा अनुसंधान संस्थान
Institute for **Plasma Research**

Project Completion Report

Brief Outline of the Project

The goal of this programme was to train a minimum of around 250 teachers across the country, who in turn are expected to train around 25,000 students in the basic areas of plasma & fusion. The meetings had 5 popular lectures, hands-on demonstrations on plasma and science activity kit on plasma and electromagnetics. The participants were provided course materials and a science kit having over 20 scientific activities to help train students.

The schedule of the 5 meetings was decided to be as following, taking into consideration the convenience of the organizing state agency as well as the other normal scientific duties of the programme team from IPR.

- 1) 10-11 April 2018 at Chandigarh (PSCST)
- 2) 7-8 May 2018 at Bhopal (MPCOST)
- 3) 7-8 June 2018 at Guwahati (ASTEC)
- 4) 21-22 June 2018 at Gandhinagar (GUJCOST)
- 5) 12-13 July 2018 at Bangalore (KSCST)

The scheduled meeting at New Delhi was moved to Chandigarh due to logistical reasons and post-facto approval for the same was obtained from NCSTC. The work on generating the resource materials for the programme started in April 2017 and was completed in Dec 2017. The tendering and purchase procedure (as per DAE purchase procedures) for these items was initiated in January 2018 and the items were received during the 2nd week of March 2018.

1. Science Activity Kit (English and Hindi) : 1000 / 700 each
2. Book "Living with Plasmas" (English and Hindi) : 1000 / 700 each
3. Set of 10 posters on Plasma, Applications of Plasma, and Fusion (English and Hindi) : 1000 / 700 sets each
4. DVD with electronic versions of (1) PPTs of all the talks (2) Posters (3) Books (4) Videos on plasma : 500 nos

No project staff was appointed as the salary budget was reserved to partially meet the expenses of the salary of the consultant. Since the person selected for this post did not take up the position due to health grounds, the budget of Rs.3.60 Lakhs under head "Manpower" remains unspent.

Expenditure has been incurred from all the other budget heads namely, (a) Resource material, (b) Cost of Workshops (c) Overheads and Contingency. Since we are yet to receive the Budget Utilization Certificates from the various agencies which conducted the programme, the BUC for the whole project is yet to be finalized.

AWARENESS-CUM-TRAINING PROGRAMME

ON

PLASMA SCIENCE & TECHNOLOGY AND ENERGY FROM NUCLEAR FUSION



A Joint Initiative of the Institute for Plasma Research, Gandhinagar

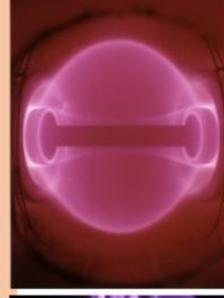
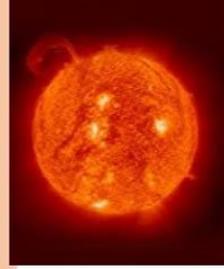
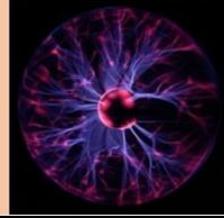
and

The National Council for Science and Technology Communication, DST, New Delhi

राविप्रौसत्प NCSTC

As part of this programme, Institute for Plasma Research, Gandhinagar will conduct 2-day interactive meetings at FIVE locations around the country, *i.e.*, in Gandhinagar (Gujarat), Bangalore (Karnataka), Bhopal (Madhya Pradesh), Guwahati (Assam) and Chandigarh (Punjab) for Physics teachers of high school and junior colleges. The goal of this programme is to train a minimum of around 250 teachers across the country, who in turn are expected to train around 25,000 students in the basic areas of plasma & fusion. The meetings will have popular lectures on this topic by experts, hands-on demonstrations and interactive discussions on the topic of plasma & fusion science & technology. The participants will also be provided course materials and a science kit having over 20 scientific activities to help train students. They will also be provided with a participation certificate after the completion of the meeting.

These meetings will be held at Gandhinagar (Gujarat), Chandigarh (Punjab), Bhopal (MP), Guwahati (Assam) and Bangalore (Karnataka) between the period of March-July 2018. The number of candidates will be limited to 50 for each programme and will be selected by the designated state S&T Council and will be provided to and fro train fare (3T A/C sleeper) and basic boarding & lodging during the course of the meeting. Study materials such as Science Kit, Posters, booklets and DVD will also be provided along with participation certificate.



NCSTC Project, Institute for Plasma Research, Bhat,
Gandhinagar 382428 (Gujarat)



Tel : 079-23962181
Email : outreach@ipr.res.in

Meeting Schedule

A total of at least 50 participants were expected to be nominated by the host State Council of Science & Technology with appropriate distribution of participants from each of the states in that particular zone.

| | | | | |
|---------|-----------------|-------------------|--|------------------|
| Zone 1 | Northern Region | J&K | Chandigarh Punjab State Council for Science & Technology | 10-11 April 2018 |
| | | Haryana | | |
| | | Punjab | | |
| | | Delhi | | |
| | | Himachal | | |
| | | Uttarakhand | | |
| Zone 2 | Central Region | Madhya Pradesh | Bhopal M.P. State Council for Science & Technology | 7-8 May 2018 |
| | | Uttar Pradesh | | |
| | | Chhattisgarh | | |
| | | Bihar | | |
| | | Jharkhand | | |
| Zone 3 | Eastern Region | West Bengal | Guwahati Assam State Council of Science & Technology | 7-8 June 2018 |
| | | Orissa | | |
| | | Assam | | |
| | | Meghalaya | | |
| | | Manipur | | |
| | | Nagaland | | |
| | | Arunachal Pradesh | | |
| | | Sikkim | | |
| Tripura | | | | |
| Zone 4 | Western Region | Gujarat | Gandhinagar Gujarat State Council for Science & Technology | 21-22 June 2018 |
| | | Maharashtra | | |
| | | Goa | | |
| | | Rajasthan | | |
| | | Daman & Diu | | |
| Zone 5 | Southern Region | Karnataka | Bangalore Karnataka State Council for Science & Technology | 12-13 July 2018 |
| | | Kerala | | |
| | | Tamilnadu | | |
| | | Andhra Pradesh | | |
| | | Telangana | | |
| | | Puducherry | | |

Tentative Schedule of the Training Programme

Schedule: Day – I

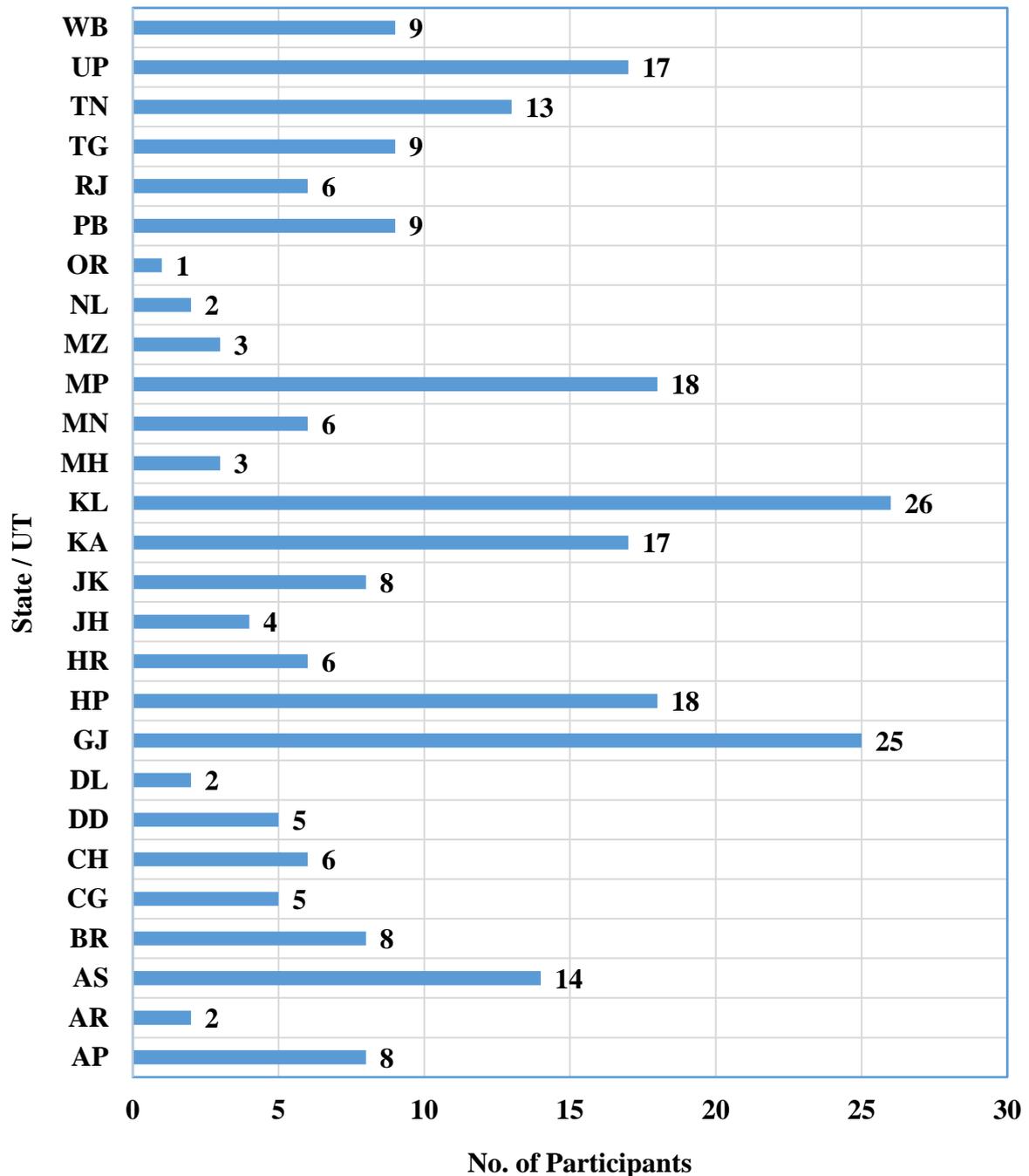
| Time | Event |
|-------------|--|
| 09:00-09:30 | Registration |
| 09.30-10.00 | Inauguration |
| 10.00-10.30 | Tea |
| 10.30-11.15 | Talk-I - Overview of the Program & Introduction to Plasma |
| 11.15-12.00 | Talk-II - Basic Plasma |
| 12.00-12.45 | Talk-III - Basic Fusion |
| 12.45-14.00 | Lunch |
| 14.00-16.30 | Hands-on Experiments (Discharge Plasma Setup, Ion Engine, Jacobs ladder, Plasma globe) and Posters on plasma |
| 16.30-17.00 | Tea and discussion / interactive session with trainers |

Schedule: Day –II

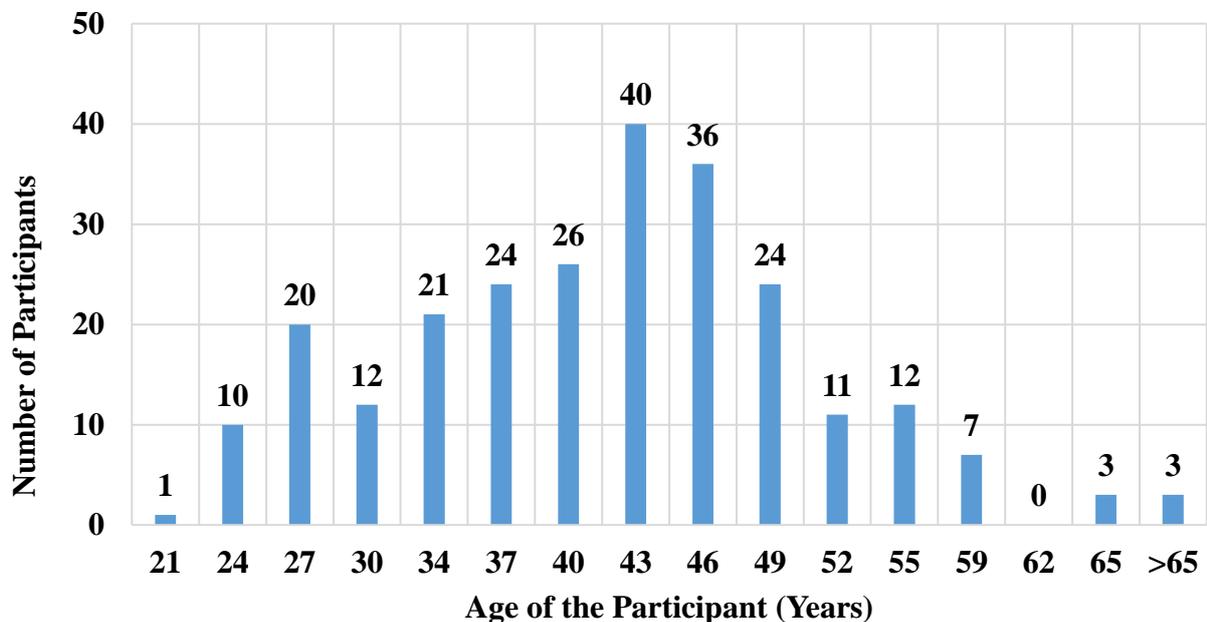
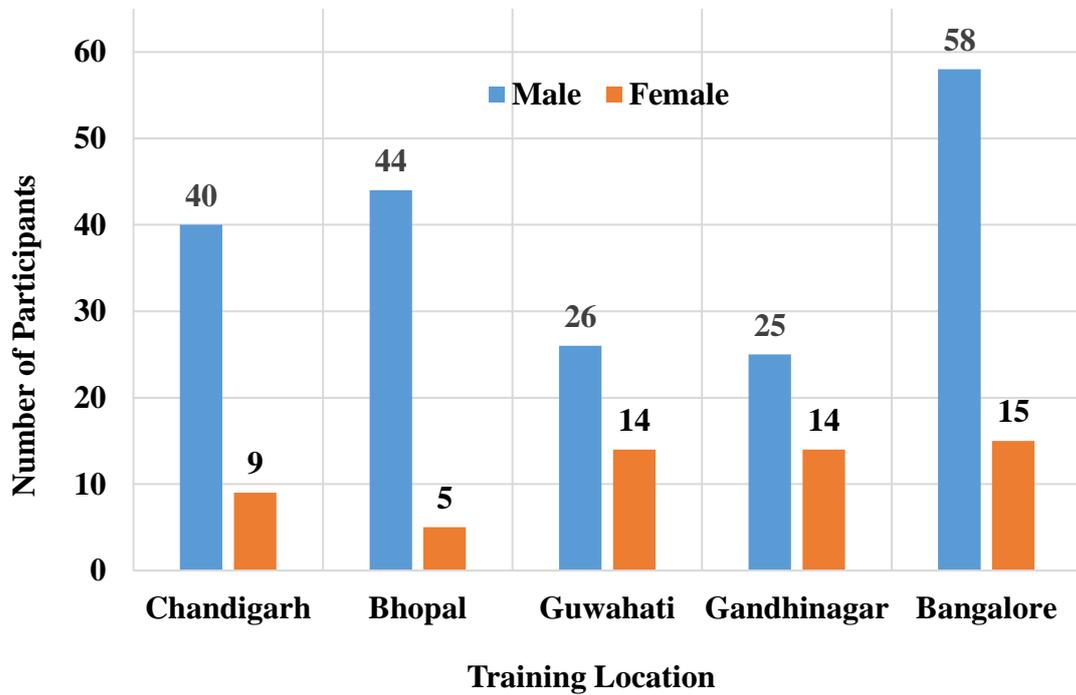
| Time | Event |
|-------------|---|
| 09:30-10.15 | Talk-IV - Applications of Plasma |
| 10.15-11.00 | Talk-V – Overview of IPR |
| 11:00-11:15 | Tea |
| 11:15-13:00 | Demonstration of Science Activity Kit |
| 13:00-14.00 | Lunch |
| 14:00-15:00 | Participants' feedback, distribution of certificates and Conclusion |

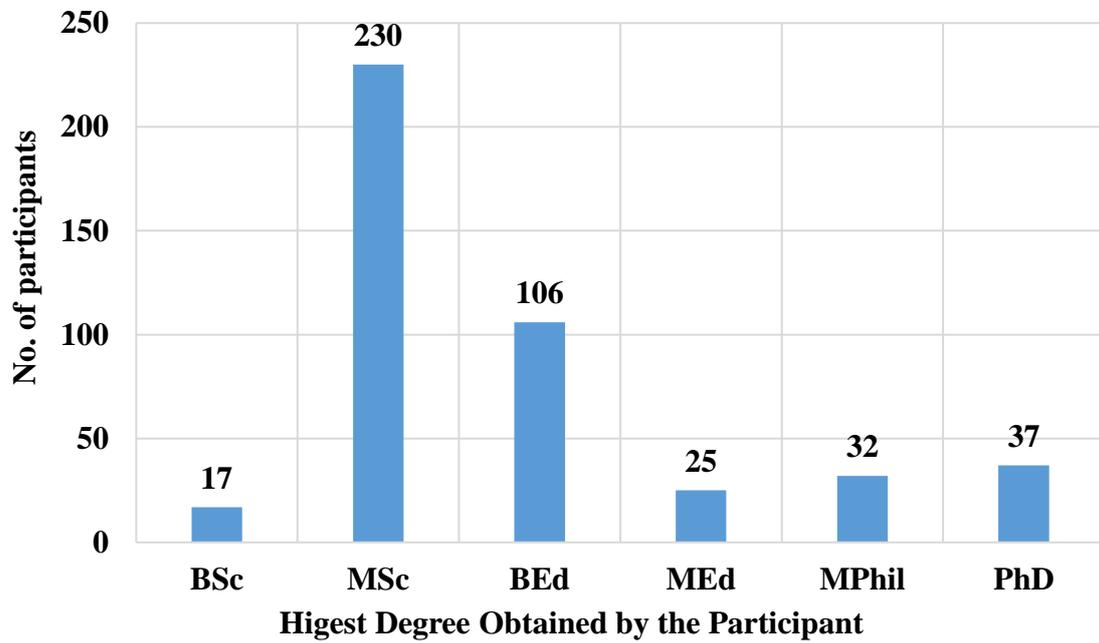
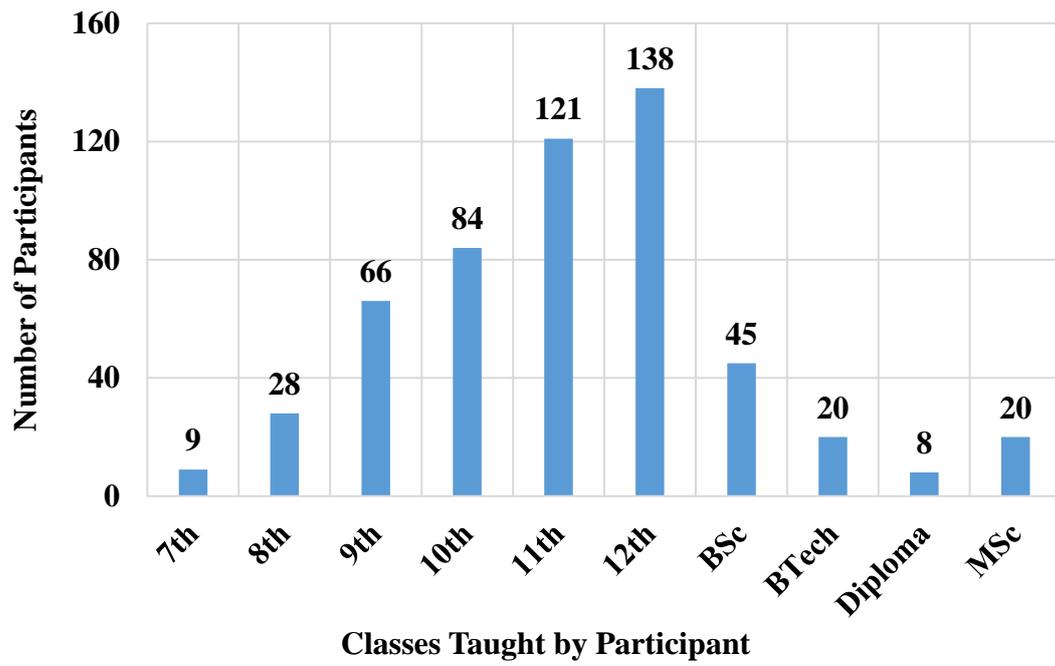
Participant statistics based on all meetings

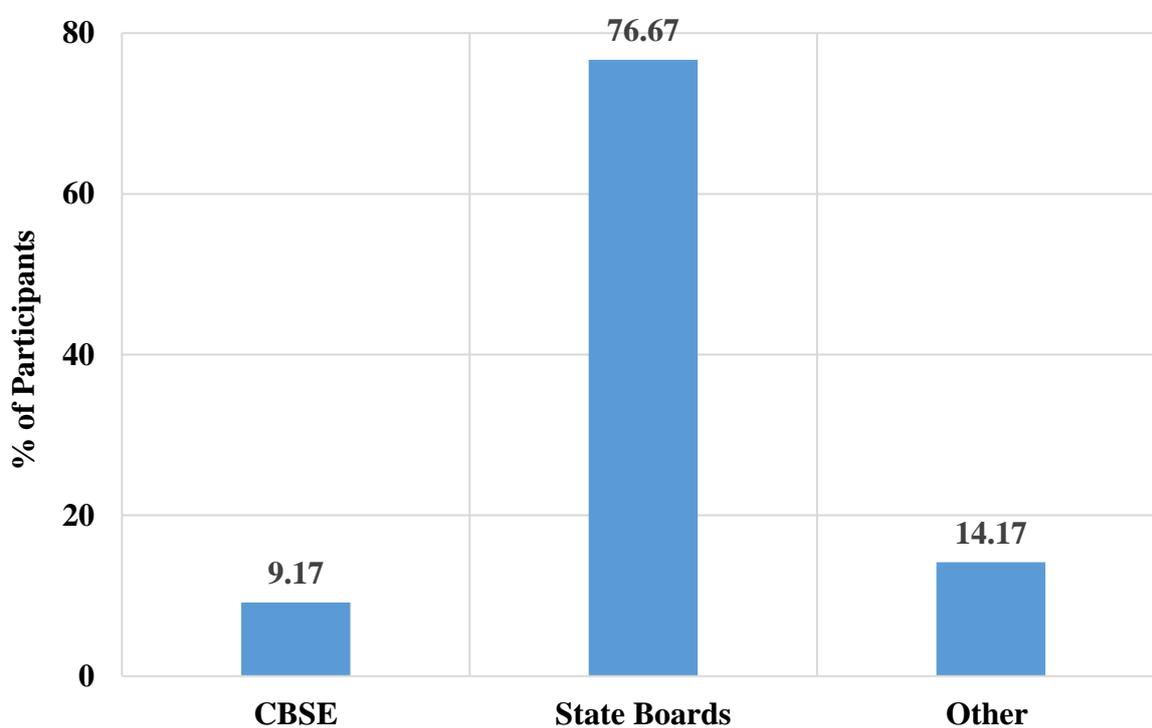
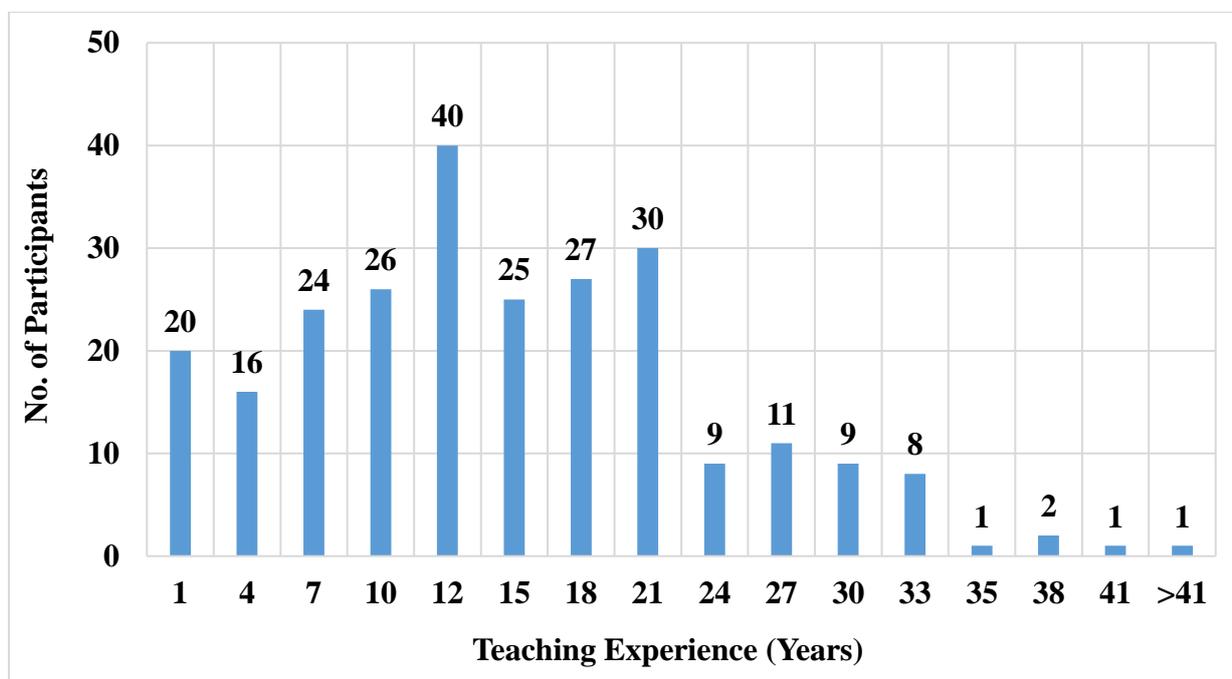
| Meeting Location | Dates (2018) | Total Registration | Total Attendees | Male | Female |
|--------------------|--------------|--------------------|-----------------|------|--------|
| Chandigarh (North) | 10-11 April | 55 | 49 | 40 | 09 |
| Bhopal (Central) | 7-8 May | 65 | 49 | 44 | 05 |
| Guwahati (East) | 7-8 June | 60 | 40 | 26 | 14 |
| Gandhinagar (West) | 21-22 June | 55 | 39 | 25 | 14 |
| Bengaluru (South) | 12-13 July | 80 | 73 | 58 | 15 |
| Total Participants | | | 250 | 193 | 57 |



The intended target audience were science teachers engaged in teaching Physics to students of 10th, 11th, 12th as well as BSc. The selection of the teachers was done through the respective state science councils as well as through physics teachers' WhatsApp groups, especially in the southern region. Of the 29 states and UTs, 250 teachers and few students from 18 states and one UT were trained during the course of the five training programmes conducted over a period from April to July 2018. The representation of women teachers from all the participants was ~ 23%. Not all states /UT could be covered due to the lack of response from their respective state science councils who were asked to nominate the participants from that state.







Examination Board Followed by the participants' institution

Majority of teachers who attended were teaching physics/science from 9th to BSc and having their educational qualifications being predominantly MSc and B.Ed. in physics. The participants had teaching experience ranging from one year to over 40 years, and taught in schools under the State Examination Boards.

Details of Resource Persons

Dr. Ravi A V Kumar

Scientific Officer – G and Head, Outreach Division

Ravi completed his MSc in Physics from the Mahatma Gandhi University, Kerala in 1986 and his PhD in Laser Applications from the Cochin University of Science & Technology, Cochin in 1993. Since 1993, he has been working as a Scientist at the Institute for Plasma Research, Gandhinagar Gujarat, which is an autonomous R&D institution under the Department of atomic Energy, Government of India.



His areas of research work include lasers and their applications, laser produced plasmas, Free-electron laser and high energy particle accelerators. During 1999-2001 he was a recipient of the Japan Society of Promotion of Science (JSPS) post-doctoral fellowship awarded by the Government of Japan for undertaking experimental research work on electron accelerator based Far Infrared Free-Electron laser at the Institute of Scientific and Industrial Research, Osaka University, Osaka, Japan.

During his tenure at IPR, he has been responsible for leading the R&D work on the first Free Electron Laser in India, plasma accelerators and heading the IPR Computer Center, where he established a state-of-the-art data center with high performance super-computing systems of 7 and 35 teraflops capacities. Currently, he heads the Outreach Division of IPR which is responsible for carrying out the various scientific and societal outreach activities of IPR. He is also the Member Secretary of the Plasma & Fusion Research Committee (PFRC) of the Board of Research in Nuclear Sciences (BRNS), which is the R&D funding agency of the Department of Atomic Energy, Government of India.

Ms. Chhaya Chavda

Scientific Officer – G

Chhaya completed Bachelor of Engineering from Gujarat University in 1984 with specialization in Microprocessor applications. In 1984 itself, she joined Physical Research Laboratory, Ahmedabad for the Advanced Promotion Program for automation of Textile Machinery. Later on, in 1985, she joined the Institute for Plasma Research, Gandhinagar as an Engineer.

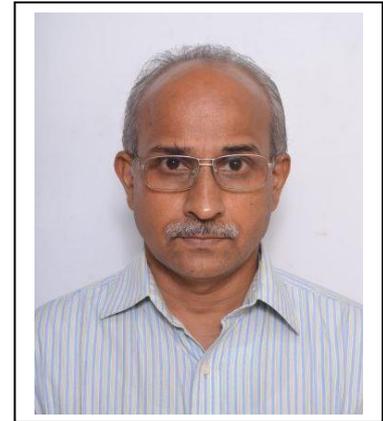
Her areas of interest are development and management of signal conditioning electronics and data acquisition system for different diagnostic requirements, pertinent to IPR's plasma experiments. She was leading the data acquisition group for the project Aditya. She worked for CEA, France for development of data acquisition software for their tokamak machine. Currently, she is working with the Outreach Division of IPR and involved in executing the various scientific and societal outreach activities of IPR.



Mr. Mohandas Krishnan

Scientific Officer – E

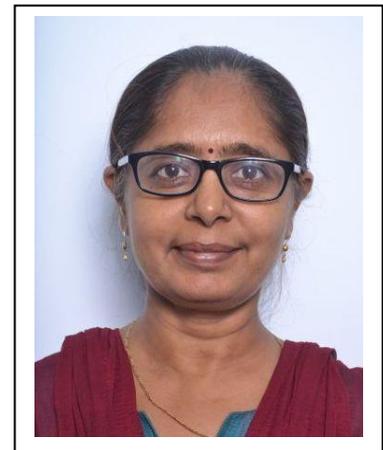
Mohandas Completed his B.Sc. degree in Physics at Calicut University, Kerala and M.Sc. Physics from Poona University. He Joined IPR in 1986 and was one of the fifty staff that represented the Institute at that time. Initially, his areas of work included providing experimental setup building as well as running of several of the basic plasma physics activities of IPR. Later on involved, he was involved in the in free Electron Laser experiment (FEL) of IPR as well as the Plasma Wakefield Acceleration experiment. Currently he is a member of Outreach Division of the Institute and is involved in the various scientific outreach activities of IPR like scientific communication for the monthly IPR newsletter, science day activities, development of science models etc. He has wide experience in vacuum technology, high voltage applications, plasma diagnostics, design and fabrication of mechanical components and basic and high voltage electronics.

**Ms. Harsha Machchhar**

Scientific Officer – E

Harsha completed her AMIE through institution of Engineers, Kolkata and Masters in Engineering (Electronics) from Gujarat university. She worked at the Physical Research Laboratory for 3 years (from Aug 1988 to Jan 1992) after which she joined IPR in 1992, to work with the Radio Frequency group.

Her work mainly involved design of high power RF systems like amplifiers, Klystron and gyratrons. Her other areas of interest include design and development of analog, digital and microcontroller based systems. She also worked for over 9 years in the ICH & CD group of ITER-India, IPR for 1.5MW RF generator system which is to be delivered to the international collaboration fusion system -ITER, at France. Currently she is with the Outreach Division of IPR and involved in the scientific and societal outreach activities of IPR.

**Dr. N. Ramasubramanian**

Scientific Officer – F

Ramasubramanian completed Ph,D thesis in Plasma Physics from IPR in year 2001 and joined the Max-Planck-Institut fuer Plasmaphysik (IPP-Garching), Germany, where he worked on the Wendelstein W7-AS stellarator experiment. He then moved with the group to Greifswald for the conceptual design of W7-X diagnostics. In November 2003, he joined ASDEX-Upgrade group and worked there till January 2005. After that he joined IPR as scientist. He is now working for ITER CXRS-Pedestal diagnostics and also developing a basic experiment for confining cesium plasma in a multi-cusp magnetic field. He has more than 46 published papers in reputed journals and many are in pipeline. He is also an assistant professor at Homi Bhabha National Institute. He is also actively involved in the scientific outreach activities of IPR.



Meeting No. 1 : Chandigarh (Northern Region)

The Chandigarh meeting was held at the Mahatma Gandhi State Institute of Public Administration, Sector 26, Chandigarh on 10-11 April, 2018, and the local organization was done by Dr. Kulbir Bath, Senior Project Officer of the PSCST. Forty Nine teachers of Physics (Higher Secondary and Junior College) participants from the states of Punjab, Haryana, Himachal Pradesh, Chandigarh, Jammu & Kashmir and Delhi participated in the training. There were no nominations received from the state of Uttrakhand in spite of several reminders.

The meeting was inaugurated by the Principal Secretary, Dept. of Science, Technology & Environment, Government of Punjab, Dr. Roshan Sunkaria IAS, who showed specific interest in the medical applications of plasma as he was a medical doctor by profession. Dr. Jatinder Kaur Arora, The Executive, Director, Punjab State Council for Science & Technology, presided over the meeting.

The training programme was carried out by the following team members.

1. Dr. Ravi A V Kumar (PI) (Scientific Officer – G)
2. Dr. N Ramasubramanian (Co-PI) (Scientific Officer – F)
3. Smt. Chhaya Chavda (Scientific Officer – G)
4. Mr. Raj Singh (Scientific Officer – G)
5. Smt. Harsha Machchhar (Scientific Officer – E)
6. Mr. K. K. Mohandas (Scientific Officer – E)

Schedule of the technical programme over the two days was as follows ;

1. Talk 1 – Introduction to Plasma
2. Talk 2 – Basic Plasma
3. Talk 3 – Basic Fusion
4. Hands-on experiments on plasma, Explanation of the posters and interactive session
5. Talk 4 – Applications of Plasma
6. Talk 5 – Plasma work at Institute for Plasma Research, Gandhinagar
7. Demonstration of the Science Activity Kit (Plasma and Electromagnetics)
8. Feedback from participants

Participation certificates were also provided by IPR to the participants who attended the training.

Distribution of participants from the Northern Region :

The details of participants from the various states of the Northern region are ;

| No. | State /UT | No. of Participants |
|--------------|------------------|---------------------|
| 1 | Chandigarh | 06 |
| 2 | Delhi | 02 |
| 3 | Haryana | 06 |
| 4 | Himachal Pradesh | 18 |
| 5 | Jammu & Kashmir | 08 |
| 6 | Punjab | 09 |
| 7 | Uttrakhand | 00 |
| Total | | 49 |

Feedback :

1. Training should be at least 3 days so that there is more hands-on experience.
2. This programme should be replicated at district levels in various states.
3. The resource material should be made available to those who to wish to conduct the training.

Images from the training programme at Chandigarh



Inauguration of the training programme: Dr. Sunkaria IAS, addressing the gathering



Training session in progress



Demonstration of the Science Activity kit in progress



The participants of the training programme at Chandigarh



Dr. Jatinder Kaur Arora, The ED, PSCST, addressing the gathering



Training session in progress



Principal Secretary, Dept. of Science, Technology & Environment, Govt, of Punjab, Dr. Roshan Sunkaria IAS with the interactive models.



The participants training with the interactive models of plasma



Science activity kit demonstration in progress



The hands-on live demonstrations and posters set up for the training



The demonstration setups for glow discharge plasma and Jacob's Ladder



Ion Thruster Engine

Meeting No. 2 : Bhopal (Central Region)

49 Physics teachers of high/senior school and junior colleges from the states of Madhya Pradesh, Uttar Pradesh, Bihar, Chhattisgarh and Jharkhand attended this training programme. The meeting was held at the Vigyan Bhawan, at the MPCST complex at Nehru Nagar Bhopal. Inauguration of the programme was carried out by the Director General of MPCST, Dr. Navin Chandra. Dr. Rakesh K Arya Chief Scientist and Dr. S. K. Garg, Senior Technical Officer in-charge of Popularization of Science, from MPCST along with Dr. N. Ramasubramanian and Dr. Ravi A V Kumar from IPR presided over the meeting.

The MPCST also expressed interest in visiting IPR/FCIPT to understand in detail the various plasma application-based applications and propagate them at various levels in the state of MP.

| State/UT | Participants |
|-----------------|---------------------|
| Bihar | 08 |
| Jharkhand | 01 |
| Madhya Pradesh | 18 |
| Uttar Pradesh | 17 |
| Chhattisgarh | 05 |
| Total | 49 |

Feedback :

Few of the participants from Jharkhand and Bihar could not attend the meeting due to non-confirmation of tickets and they were accommodated in the Guwahati meeting.

Participants as well as State Science Council representatives wanted to know if they could replicate this programme in their state district levels.

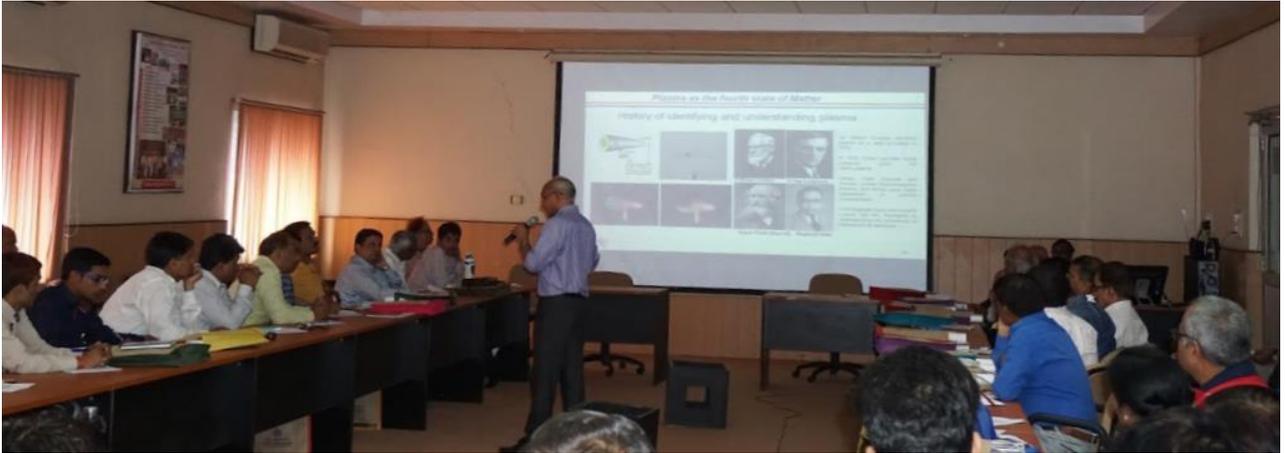
Few of the participants of this meeting already have conducted small training programmes on plasma at their school and town levels. We will be providing them with more resource material as and when they require it.



Demonstration of the Science Activity kit in progress



The participants of the training programme



Training session in progress



Setting up of the hands-on session for the participants



Hands-on plasma experiments



Hands-on training in progress



Hands-on training in progress

Meeting No. 3 : Guwahati (Eastern / North Eastern Region)

40 Physics teachers of high/senior school and junior colleges from the states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Nagaland, Orissa, Sikkim, Tripura and West Bengal attended this training programme. The meeting was held at the Regional Science Center, Khanapara, Guwahati during 7-8 June, 2018. The inauguration of the programme was done by Dr. Ranjit Barman, Senior Scientific Officer & Head I/C of the Assam Science, Technology and Environment Council (ASTEC) along with Shri. Basudev Mandal, Scientific Officer of Regional Science Center, Guwahati, Prof. Kalyal Goswami, Center Director, CPP-IPR, Sonapur and Dr. Ravi A V Kumar from IPR. The chief guest for the event was Plasma Physicist and founder director of CPP, Prof. S. Bujarbaruah.

Schedule of the technical programme over the two days was similar to that of the earlier meeting ;

Distribution of participants from the Eastern Region :

| State /UT | No. of Participants |
|-------------------|---------------------|
| Arunachal Pradesh | 02 |
| Assam | 14 |
| Jharkhand | 03 |
| Manipur | 06 |
| Mizoram | 03 |
| Nagaland | 02 |
| Orissa | 01 |
| West Bengal | 09 |
| Total | 40 |

The scientific hands-on exhibits were placed in the science museum area, hence apart from the participants of the training programme, several interested people from the general public also participated.

The participants of the training programme were also given a tour of the Science museum facility at the Regional Science Center.



Dr. Ranjit Barman of ASTEC inaugurating the programme



Prof. Kalyan Goswami of CPP-IPR addressing the gathering



Participants of the training programme



The hands-on experiments area and the display of the posters



Interactive session with the resource persons



Interactive session with the resource persons



Training session in progress

Meeting No. 4 : Gandhinagar (Western Region)

39 Physics teachers of high/senior school and junior colleges from the western states of Gujarat, Daman & Diu, Rajasthan, Maharashtra and Goa attended this training programme. The programme, held at the Ahmedabad Science City on 21-22 June, 2018, was inaugurated by Shri Ravinder Gaur, DST and was presided over by Dr. Natottam Sahoo Member Secretary, GUJCOST, Shri S. D. Vora, Executive Director, Gujarat Council of Science City, Shri. P. K. Atrey and Dr. Ravi A V Kumar from IPR. Schedule of the technical programme over the two days was similar to that of the earlier meeting.

Distribution of participants from the Western Region :

| State /UT | No. of Participants |
|--------------|---------------------|
| Daman & Diu | 05 |
| Gujarat | 25 |
| Maharashtra | 3 |
| Rajasthan | 6 |
| Total | 39 |

The scientific hands-on exhibits were placed in the science museum area, hence apart from the participants of the training programme, several interested people from the general public also participated.

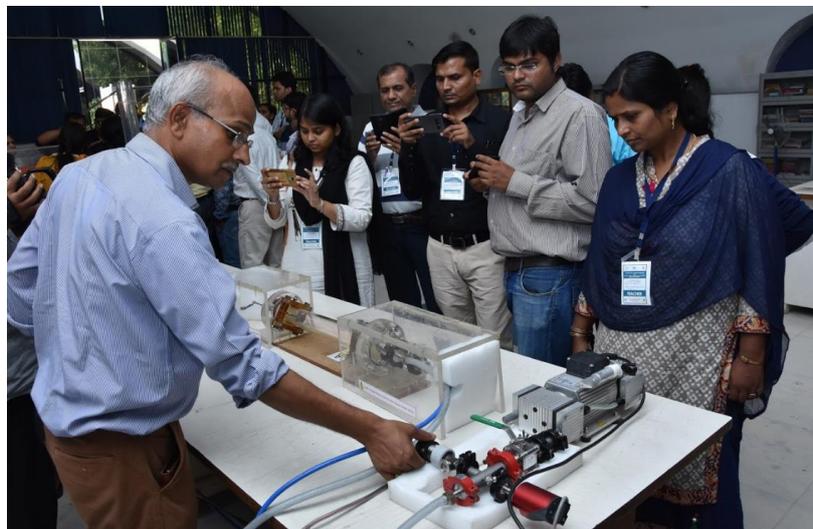
The participants of the training programme were also given a tour of the Gujarat Science City as well as IMAX movie.



Inauguration of the training programme



Participants of the training programme at Gandhinagar



The hands-on session in progress



The models of plasma applications on display for the participants

Meeting No. 5 : Bengaluru (Southern Region)

73 Physics teachers of high/senior school and junior colleges from the southern states of Andhra Pradesh, Karnataka, Kerala, Telangana, Tamilnadu and Puducherry attended this training programme. The programme, held at the Choksi Hall of the Indian Institute of Science, Bengaluru during 12-13 July, 2018. The programme was inaugurated Dr. S. G. Sreekanteswara Swamy, Executive Secretary I/C, Karnataka State Council for Science and Technology. Prof. S. Subramanian, Secretary, KSCST presided over the function. A few students from IISc also participated in this programme.

| State /UT | No. of Participants |
|----------------|---------------------|
| Andhra Pradesh | 08 |
| Karnataka | 17 |
| Kerala | 26 |
| Telangana | 09 |
| Tamilnadu | 13 |
| Total | 73 |



Inauguration of the training programme



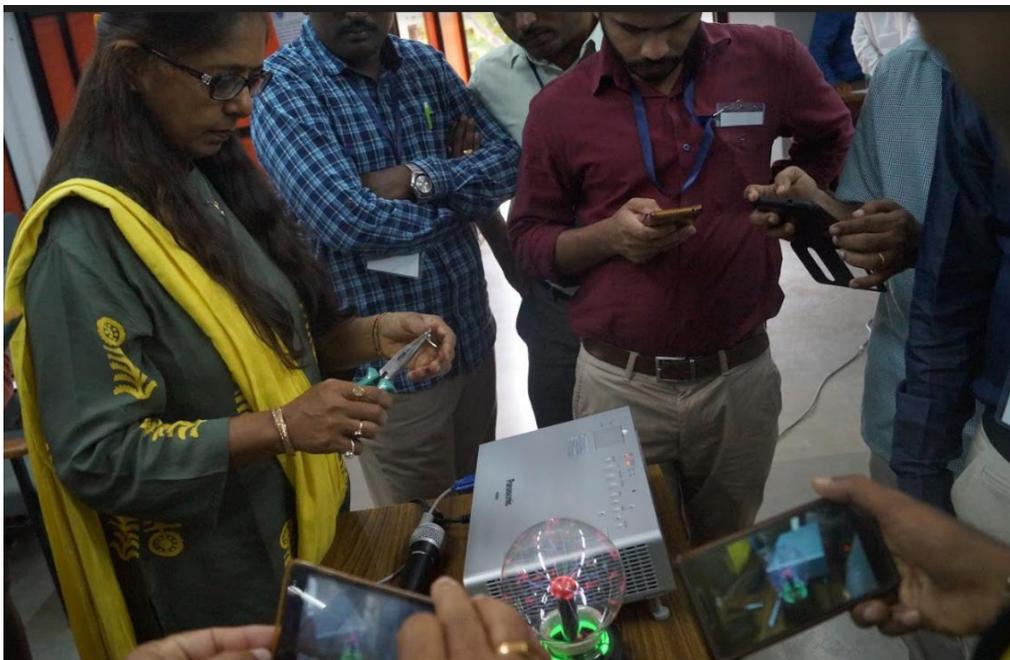
Participants of the training programme at IISc, Bengaluru



The training programme in progress



Interactive session with the participants





The hands-on session in progress



Demonstration of Science Activity kit in progress

Dr. Ravi A V Kumar
Scientific Officer (G)
Principal Investigator

Gandhinagar
22nd October, 2018

Annexure -1**IPR-NCSTC Joint programme on “Awareness-Cum-Training Programme on Plasma Science & Technology and Energy from Nuclear Fusion”****Feedback Form / प्रतिक्रिया फॉर्म**

| | | | |
|--|--|--|--|
| प्रतिभागी का नाम / Name of the Participant | | पद / Position | |
| स्कूल / कॉलेज का नाम और पूर्ण पता / Name & Full Address of School/ College | | ई-मेल/ Email | |
| | | मोबाइल नंबर / Mobile | |
| शिक्षण अनुभव के वर्षों / Years of teaching experience | | शैक्षिक योग्यता / Educational qualifications | |
| कार्यक्रम की तारीख / Program date | | कार्यक्रम की स्थान / Programme Location | |

| | माध्यमिक Secondary | उच्च माध्यमिक Higher / Senior secondary | माध्यमिक विद्यालय Junior College | स्नातक छात्र Graduate Students | |
|--|------------------------------|--|-------------------------------------|-----------------------------------|-------------------------------|
| मैं भौतिकी / विज्ञान को सिखाता हूँ I teach physics / science to | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | CBSE सीबीएसई | ICSE आईसीएसई | State Board राज्य बोर्ड | Other अन्य | |
| आपका स्कूल किस परीक्षा बोर्ड का पालन करता है? / Which examination board does your school follow ? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | जानकारी नहीं No Knowledge | थोड़ा ज्ञान Little Knowledge | तटस्थ Neutral | मध्यम ज्ञान Moderate Knowledge | अच्छा ज्ञान Good Knowledge |
| इस प्रशिक्षण कार्यक्रम में भाग लेने से पहले प्लाज्मा के बारे में आप कितना जानते थे? / How much did | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| you know about plasma BEFORE attending this training programme? | | | | | |
| इस प्रशिक्षण कार्यक्रम में भाग लेने के बाद प्लाज़्मा के बारे आपने कितना सीखा ? / How much did you learn about plasma AFTER attending this training programme? | <input type="checkbox"/> |

| | दृढ़तापूर्वक सहमत Strongly Agree | सहमत Agree | तटस्थ Neutral | असहमत Disagree | दृढ़तापूर्वक असहमत Strongly Disagree |
|--|---|--------------------------|--------------------------|--------------------------|---|
| प्रशिक्षण के उद्देश्य स्पष्ट रूप से परिभाषित थे Objectives of the training were clearly defined | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| व्याख्यान सरल और समझने में आसान थे Lectures were simple and easy to understand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| कवर किए गए विषय प्रशिक्षण के लिए प्रासंगिक थे / Topics covered were relevant to the training | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| वार्ता की सामग्री अच्छी तरह से संगठित और अनुसरण करना आसान था / The contents of the talks were well organized and easy to follow | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| वितरित सामग्री मेरे शिक्षण कार्य में सहायक होगी The materials distributed will be helpful in my teaching work | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| प्रशिक्षकों विषय के बारे में जानकार थे The trainers were knowledgeable about the topic | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| प्रशिक्षक अच्छी तरह तैयार थे The trainers were well prepared | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| प्रशिक्षण के लिए निर्दिष्ट समय पर्याप्त था / Time allotted for the training was sufficient | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| प्लाज़्मा का प्रायोगिक प्रदर्शन उपयोगी था The experimental demonstration of plasma was useful | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| प्रशिक्षकों के साथ इंटरैक्टिव सत्र जानकारीपूर्ण और उपयोगी था / Interactive sessions with the trainers was informative and useful | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | |
|--|--|--------------------------|--------------------------|--------------------------|--|
| प्रशिक्षण उद्देश्यों को पूरा किया गया The training objectives were met | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| प्रदान की गई पोस्टर की गुणवत्ता अच्छी थी / The quality of the posters provided were good | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| पोस्टर्स में वैज्ञानिक सामग्री समझने में आसान थी Scientific content in the posters were easy to understand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| विज्ञान गतिविधि किट की गुणवत्ता अच्छी थी The quality of the science activity kit was good. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| किट में विभिन्न गतिविधियों को समझना और दोहराना आसान था। / The various activities in the kit were easy to understand and repeat. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | दृढ़तापूर्वक सहमत Strongly Agree | सहमत Agree | तटस्थ Neutral | असहमत Disagree | दृढ़तापूर्वक असहमत Strongly Disagree |
| "हमारे जीवन में प्लाज़्मा" पुस्तक की सामग्री सरल और सूचनात्मक है / Contents of the book "Living with Plasma" is simple and informative. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| डीवीडी में संसाधन सामग्री छात्रों को प्लाज्मा पढ़ाने के लिए उपयोगी होगा। / The resource materials in the DVD will be useful to teach plasma to students. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| प्रशिक्षण स्थान और सुविधाएं पर्याप्त और आरामदायक थी / The training location and facilities were adequate and comfortable | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| प्रशिक्षकों के साथ बातचीत करने का पर्याप्त अवसर था / There was ample opportunity to interact with the trainers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| प्रदान किया गया आवास पर्याप्त और आरामदायक था / Accommodation provided was adequate and comfortable | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| प्रशिक्षण के दौरान प्रदान किए गए भोजन पर्याप्त और अच्छी गुणवत्ता के थे / Food provided during the training was adequate and of good quality | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| क्या आप भविष्य में प्लाज्मा पर एक उन्नत प्रशिक्षण कार्यक्रम में शामिल होना चाहते हैं? / | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | |
|---|--|--------------------------|--------------------------|--------------------------|--|
| Would you like to attend an advanced training programme on Plasma in future? | | | | | |
| प्रशिक्षण उद्देश्यों को पूरा किया गया The training objectives were met | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| प्रदान की गई पोस्टर की गुणवत्ता अच्छी थी / The quality of the posters provided were good | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| पोस्टर्स में वैज्ञानिक सामग्री समझने में आसान थी Scientific content in the posters were easy to understand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| विज्ञान गतिविधि किट की गुणवत्ता अच्छी थी The quality of the science activity kit was good. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| किट में विभिन्न गतिविधियों को समझना और दोहराना आसान था। / The various activities in the kit were easy to understand and repeat. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| "हमारे जीवन में प्लाज़्मा" पुस्तक की सामग्री सरल और सूचनात्मक है / Contents of the book "Living with Plasma" is simple and informative. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| डीवीडी में संसाधन सामग्री छात्रों को प्लाज़्मा पढ़ाने के लिए उपयोगी होगा। / The resource materials in the DVD will be useful to teach plasma to students. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | दृढ़तापूर्वक सहमत Strongly Agree | सहमत Agree | तटस्थ Neutral | असहमत Disagree | दृढ़तापूर्वक असहमत Strongly Disagree |
| प्रशिक्षण स्थान और सुविधाएं पर्याप्त और आरामदायक थी / The training location and facilities were adequate and comfortable | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| प्रशिक्षकों के साथ बातचीत करने का पर्याप्त अवसर था / There was ample opportunity to interact with the trainers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| प्रदान किया गया आवास पर्याप्त और आरामदायक था / Accommodation provided was adequate and comfortable | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| प्रशिक्षण के दौरान प्रदान किए गए भोजन पर्याप्त और अच्छी गुणवत्ता के थे / Food provided during the training was adequate and of good quality | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <p>क्या आप भविष्य में प्लाज्मा पर एक उन्नत प्रशिक्षण कार्यक्रम में शामिल होना चाहते हैं ? / Would you like to attend an advanced training programme on Plasma in future?</p> | <input type="checkbox"/> |
| <p>इस प्रशिक्षण कार्यक्रम के बारे में आपको कैसे पता चला? / How did you come to know about this training programme?</p> | | | | | |
| <p>इस कार्यक्रम में भाग लेने के लिए आपकी अभिप्रेरणा क्या है ? / What was your motivation to attend this programme?</p> | | | | | |
| <p>इस प्रशिक्षण कार्यक्रम के बारे में आपको सबसे अच्छा क्या पसंद आया? / What did you like the best about this training programme?</p> | | | | | |
| <p>क्या प्रशिक्षण कार्यक्रम के पहलुओं को बेहतर बनाया जा सकता? / What aspects of the training programme could be improved?</p> | | | | | |
| <p>क्या कुछ ऐसी चीज है जिसे आप विज्ञान गतिविधि किट में जोड़ना पसंद करते हैं? यदि हां, तो कृपया कुछ शब्दों में वर्णन करें। / Is there anything that you would have liked to see added to the Science Activity Kit ? If so, please describe in few words.</p> | | | | | |
| <p>इस प्रशिक्षण कार्यक्रम से आपको क्या फायदा हुआ? / How did this programme benefit you?</p> | | | | | |
| <p>क्या आप अपने छात्रों को प्लाज्मा के बारे में सिखाएंगे? यदि हां, तो कैसे ? Will you teach your students about plasma? If so, how?</p> | | | | | |
| <p>क्या आपको इस प्रशिक्षण कार्यक्रम में भाग लेने के लिए आधिकारिक छुट्टी मिलने में कठिनाई हुई है? / Did you have difficulty in getting official leave to attend this training programme?</p> | | | | | |

| | |
|---|--|
| आप इस प्रशिक्षण कार्यक्रम के बारे में कोई अन्य टिप्पणी / टिप्पणियां करना चाहते हैं? / Any other comment / observation you wish to make regarding this training programme? | |
| क्या आप इस प्रशिक्षण कार्यक्रम से पहले प्लाज्मा अनुसंधान संस्थान के बारे में जानते थे? / Were you aware about Institute for Plasma Research before this training programme? | |

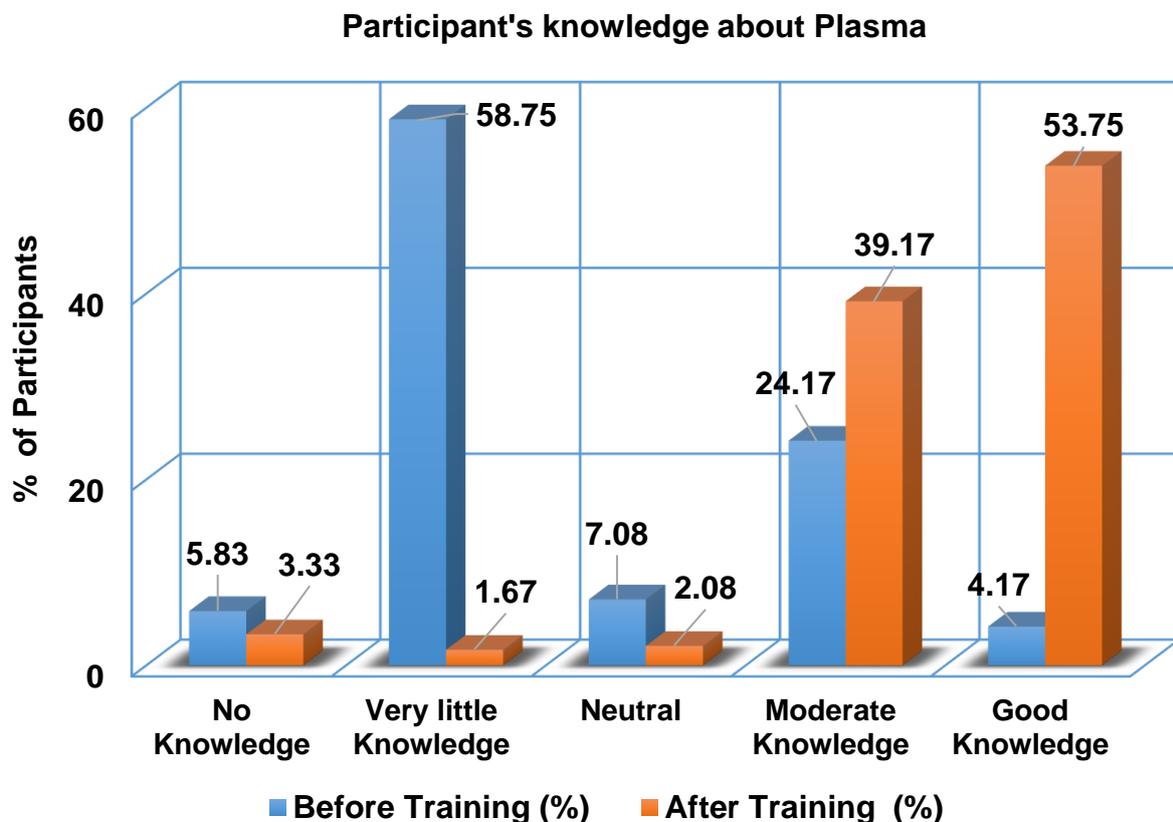
प्रतिभागी के हस्ताक्षर / Signature of the participant

Statistics Based On Feedback From Participants

All the 250 participants were requested to submit a detailed feedback after the completion of the training programme. The following data shown are from the responses of 241 participants. The template of the feedback form is given in Annexure -1.

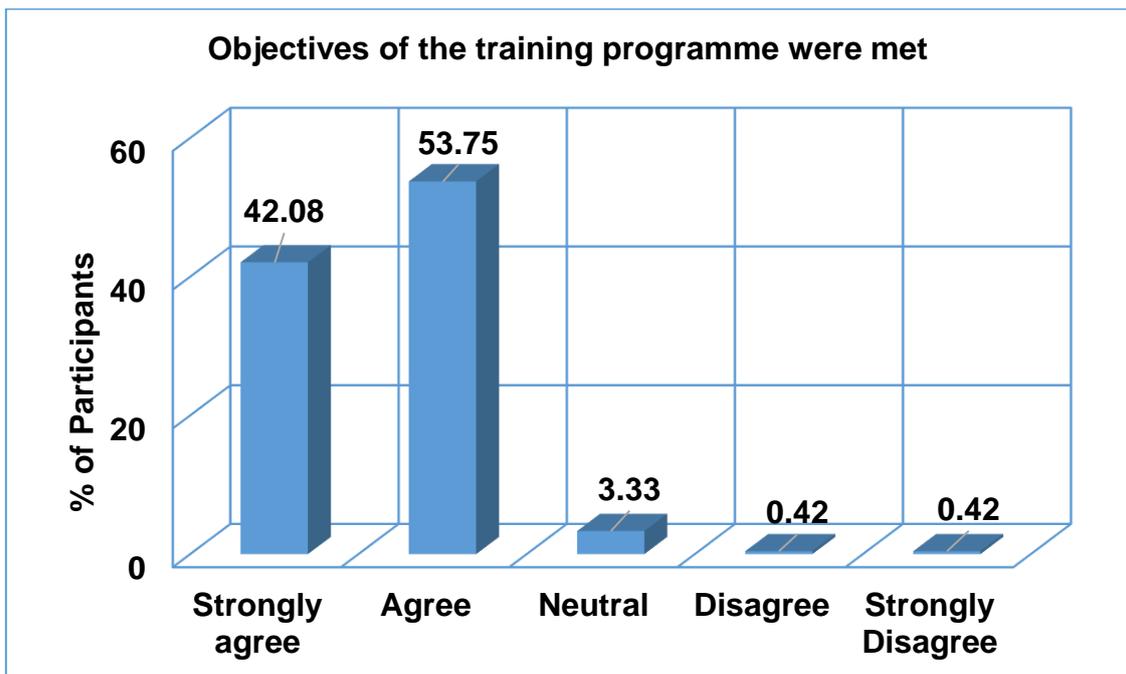
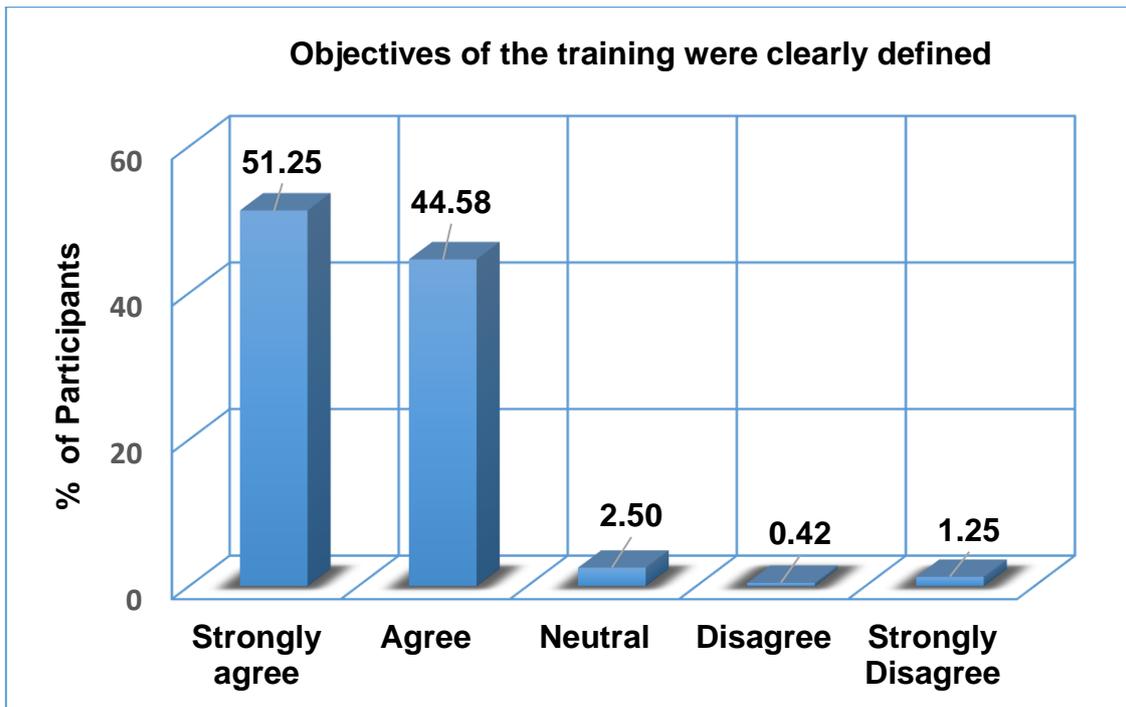
1. Basic knowledge about plasma before and after the training programme.

Before the start of the training programme almost 65% of the participants did not know anything about plasma and only 24% of the participants has some prior knowledge about Plasma. However, after the end of the programme, more than 93% of the participants reported that they had learnt sufficiently enough to introduce the topic of plasma to their colleagues and students. This is by far, the most important outcome of this programme, and also establishes that the goal of the programme to introduce plasma science and its applications to the teachers was successful to a great extent.



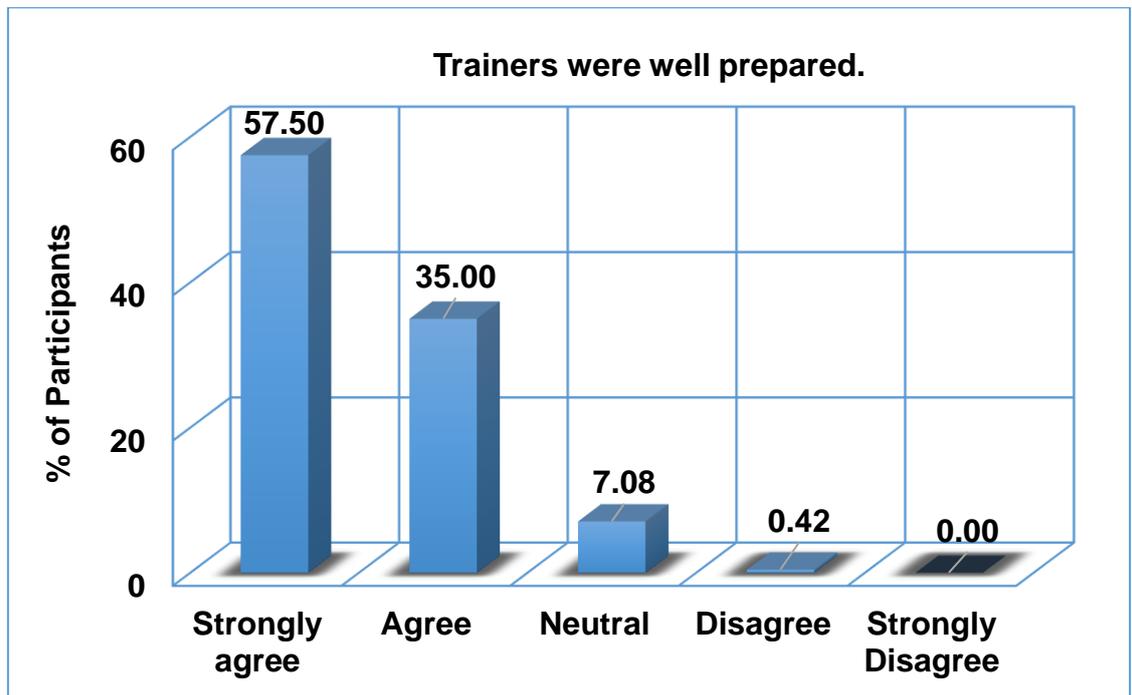
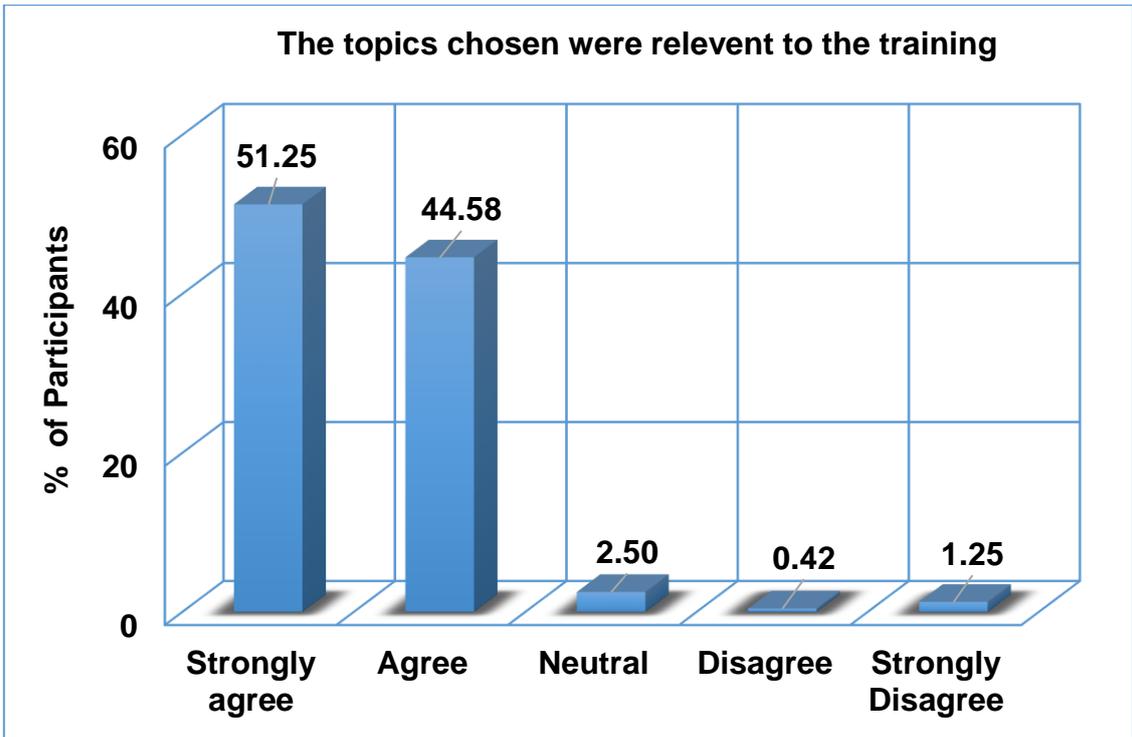
2. Clarity in the objectives of the programme

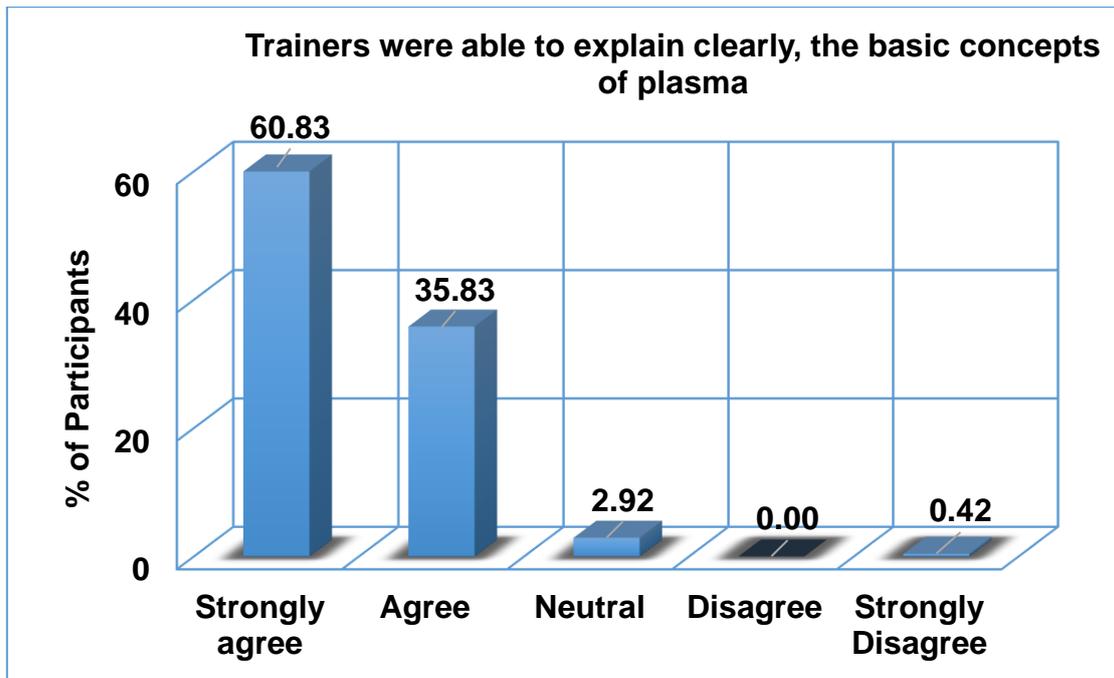
95.80% of the participants agreed that there was clarity in the objectives of the programme and its implementation, which was to introduce the teachers to the subject of plasma and its applications. Majority of the participants (95.83%) reported that the objectives of the training programme were achieved.



3. Contents of the training programme

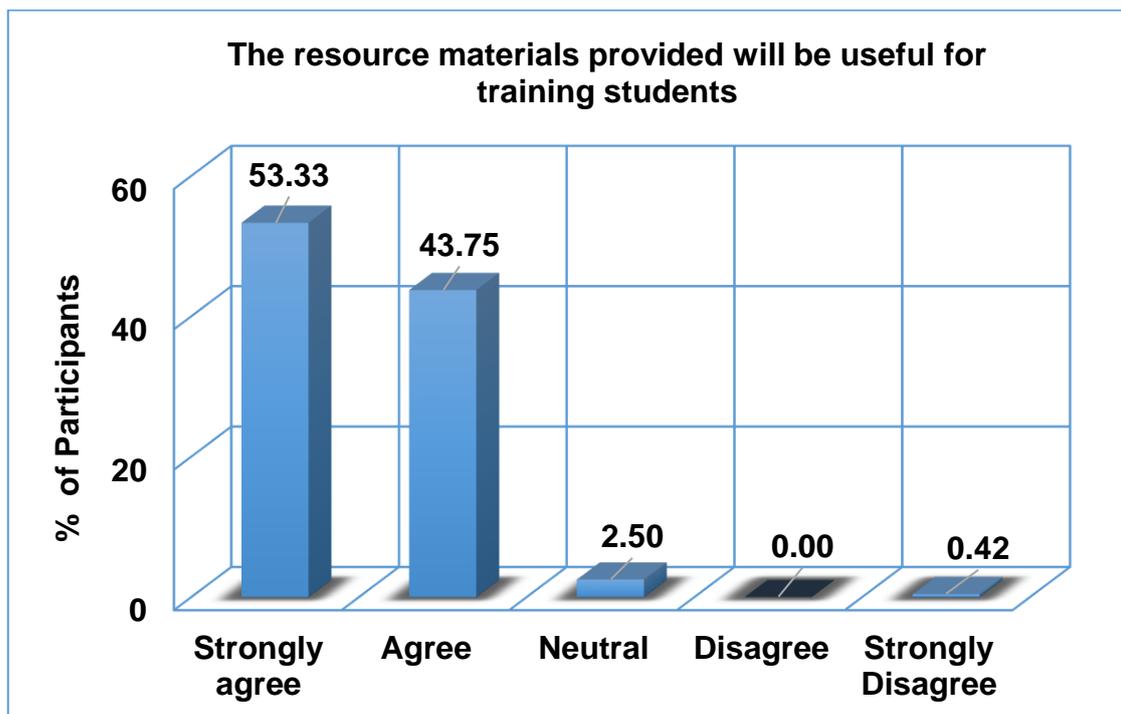
93.52% of the participants responded that the contents of the lectures in the training programme were easy to follow. This was an important criterion based on which the contents of the training programme was designed as the teachers were being introduced to a totally new topic, hence the lectures had to be kept as simple as possible. Over 95% of the participants felt that the lectures were simple and easy to follow, and that the trainers were able to clearly explain the concepts of plasma.

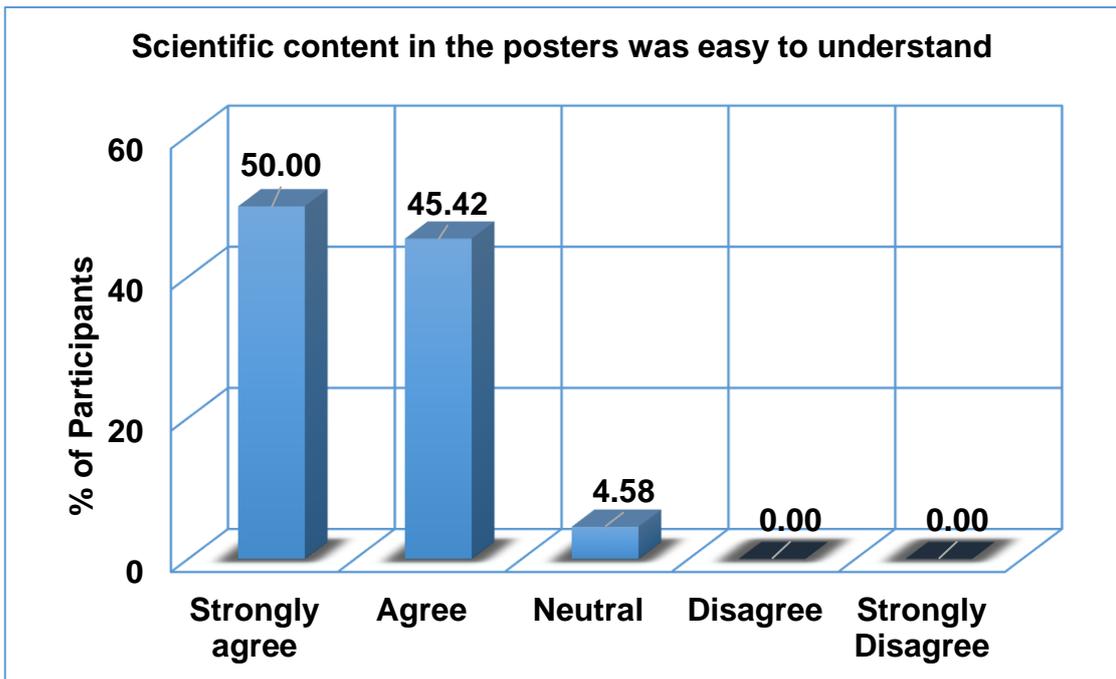
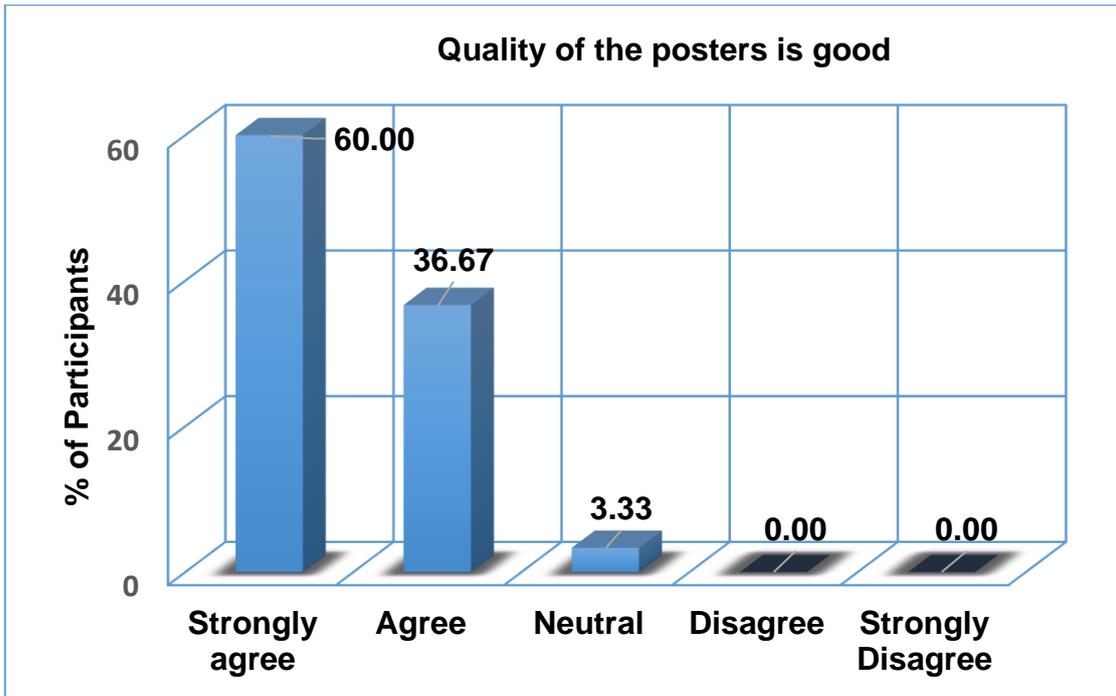


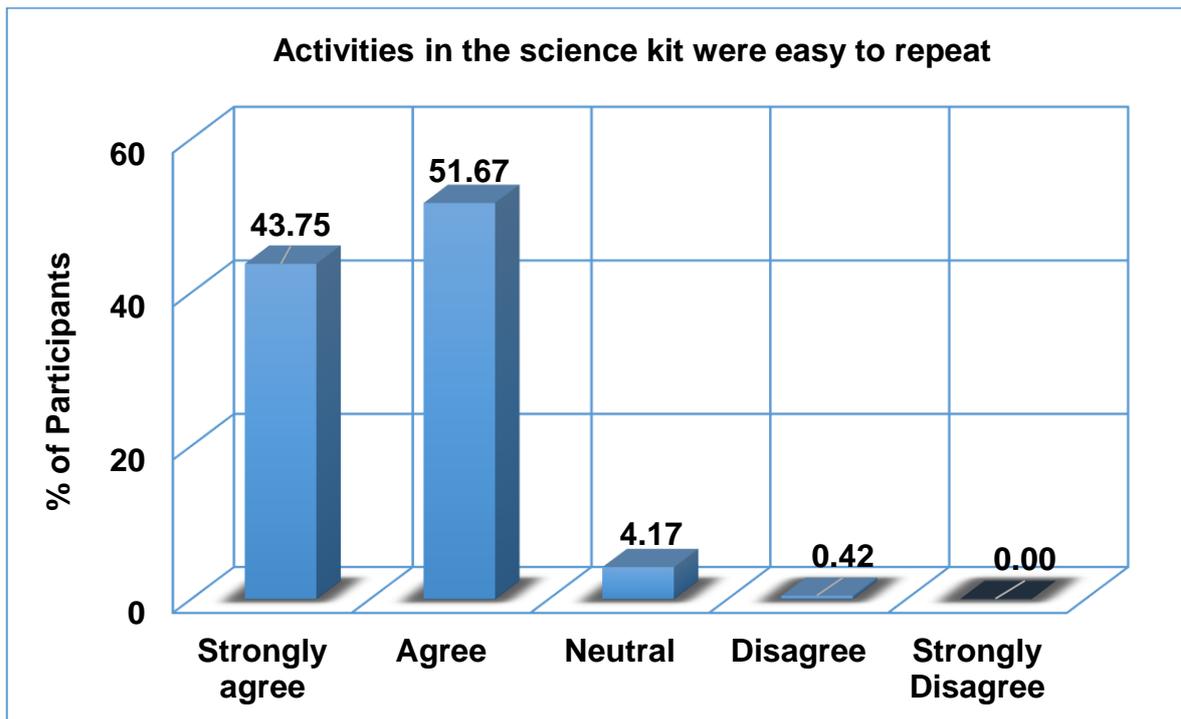
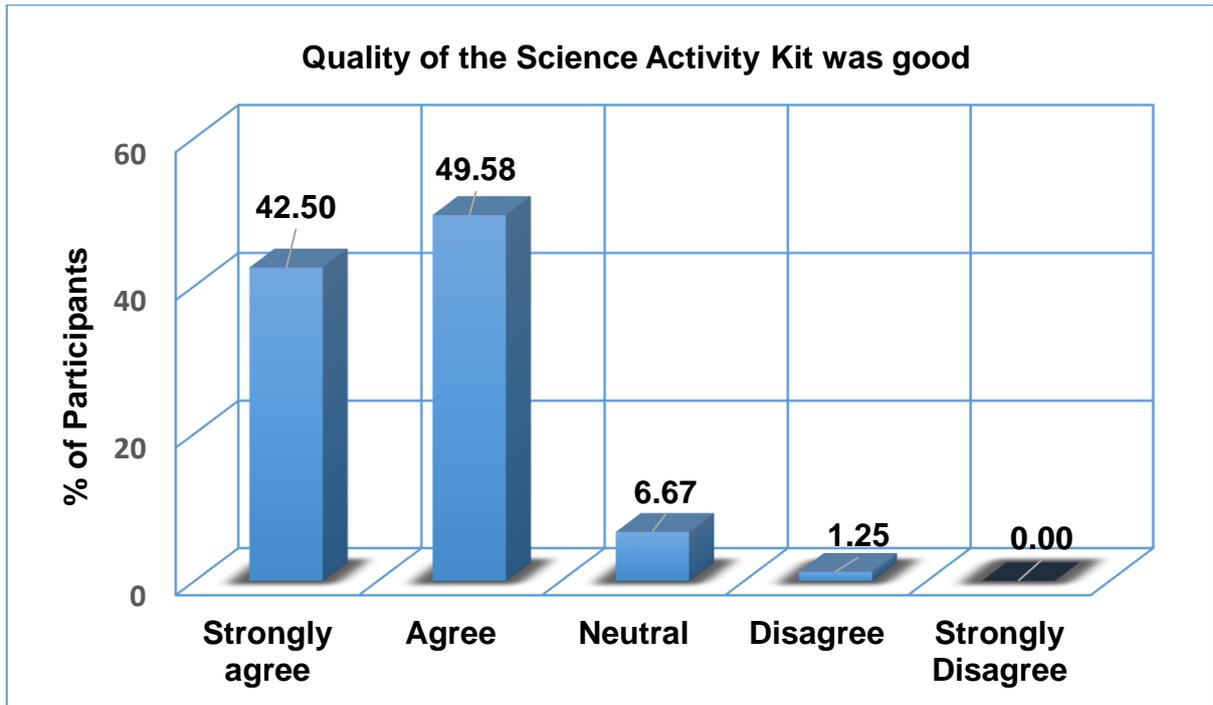


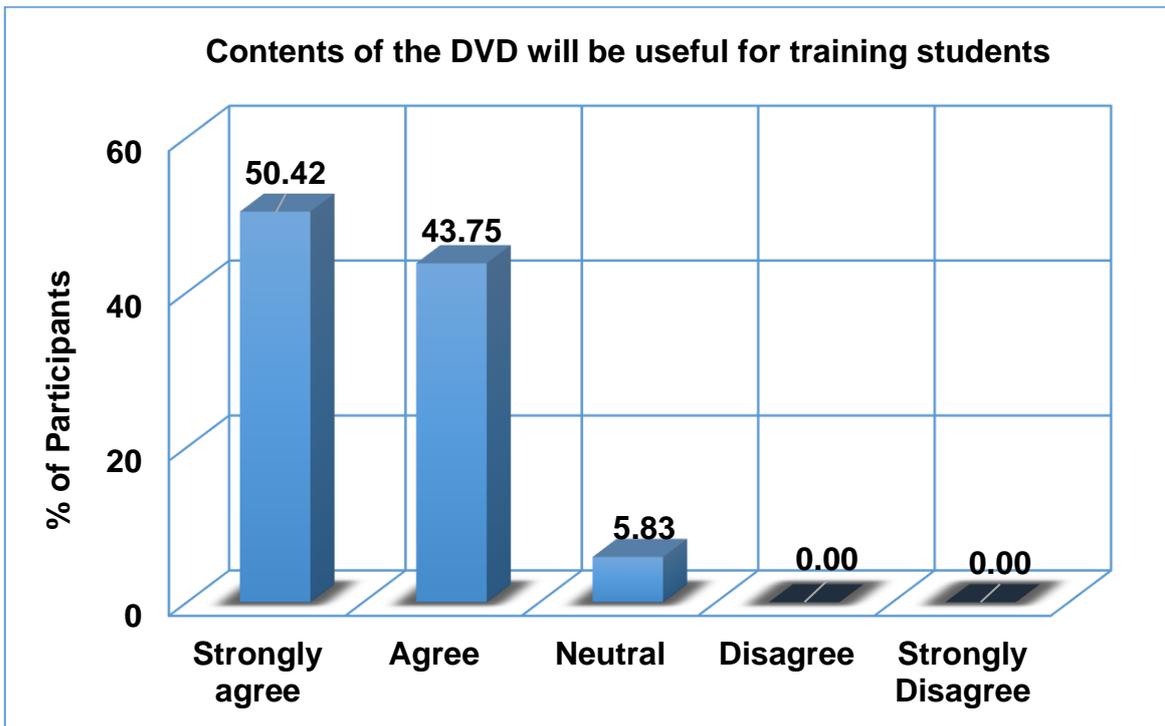
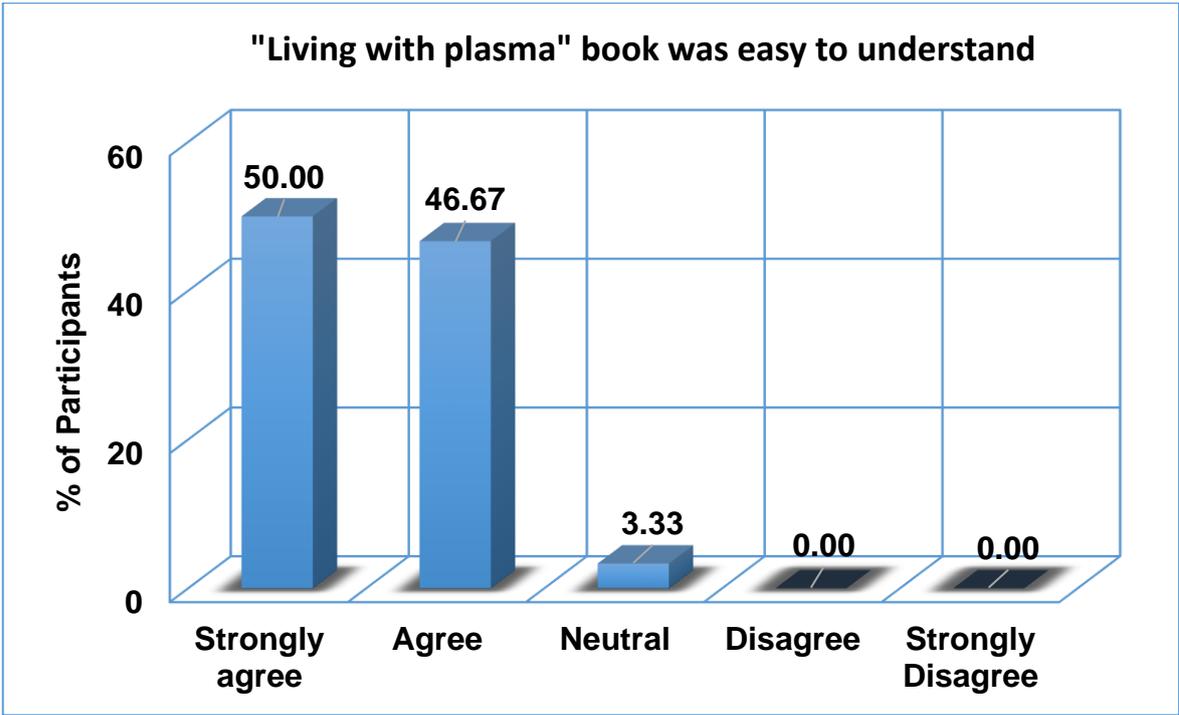
4. Quality of resource materials

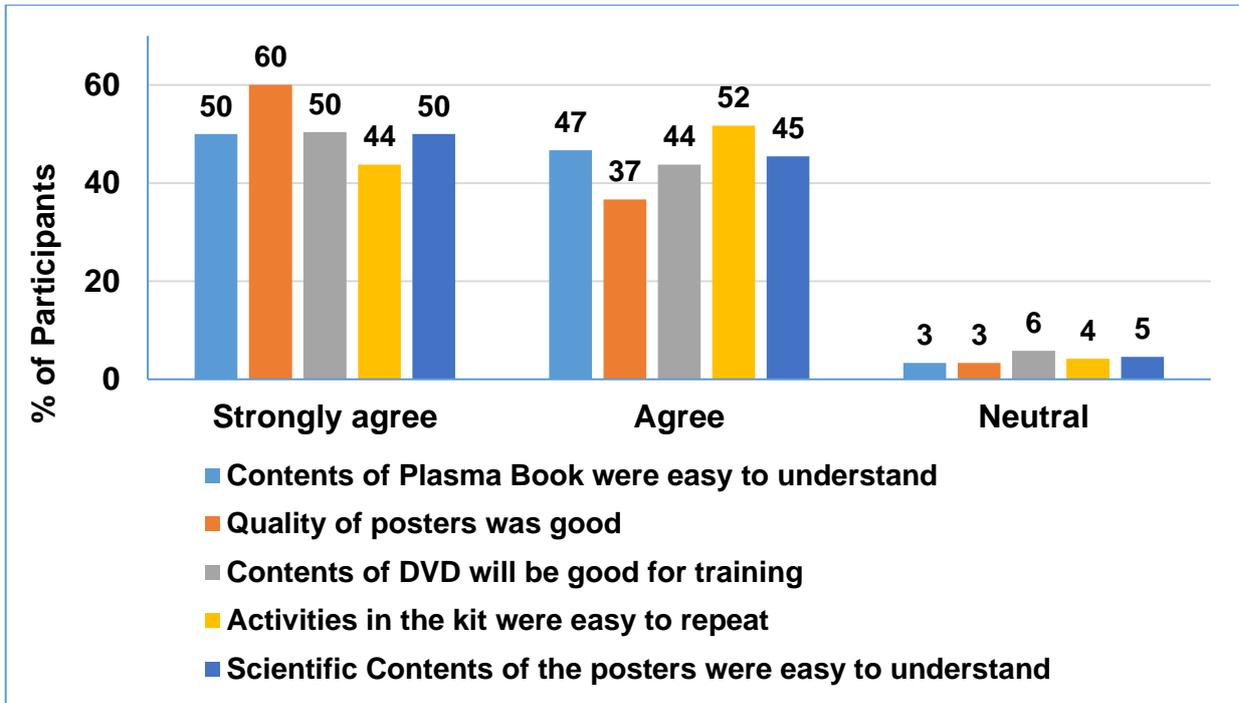
Scientific quality and ease of understanding of the resource materials also play a very important role in the continuity of the programme. The teacher must be able to first understand the contents of the resource materials provided to him/her in order that they can efficiently train others without any further assistance from the resource persons. Majority of the participants responded that the quality of the resource materials provided were of good quality and easy to understand. Over 97% of the participants agreed that the resource materials provided to them will help them train students.





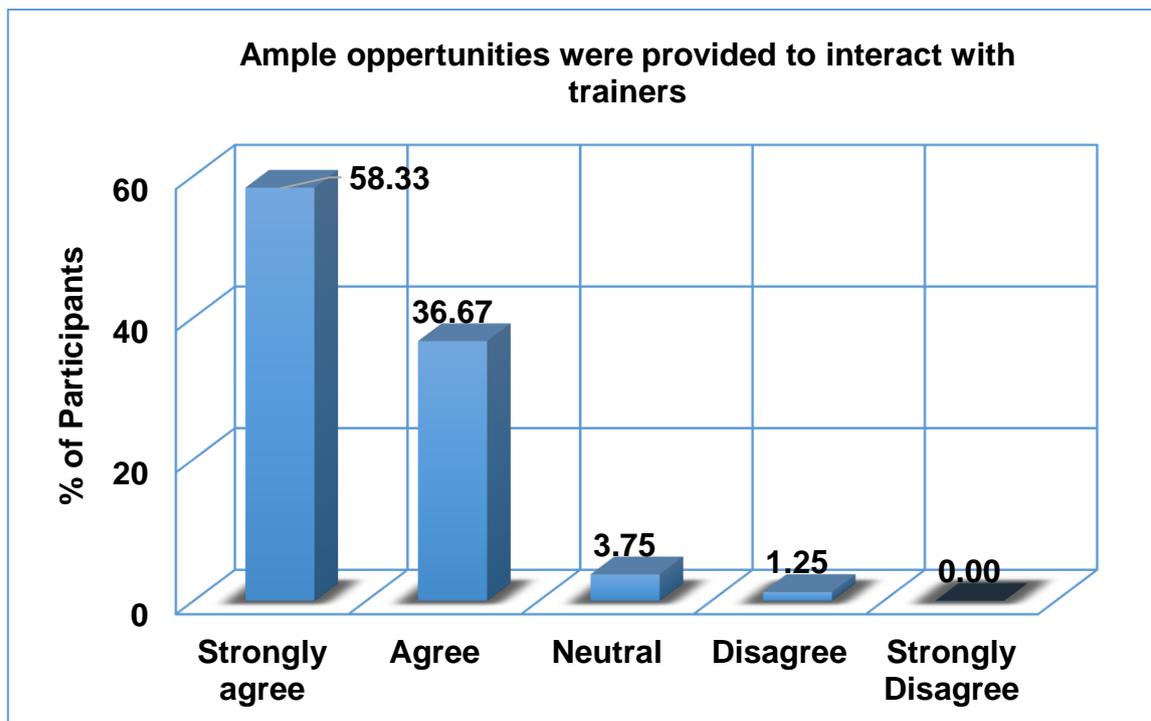


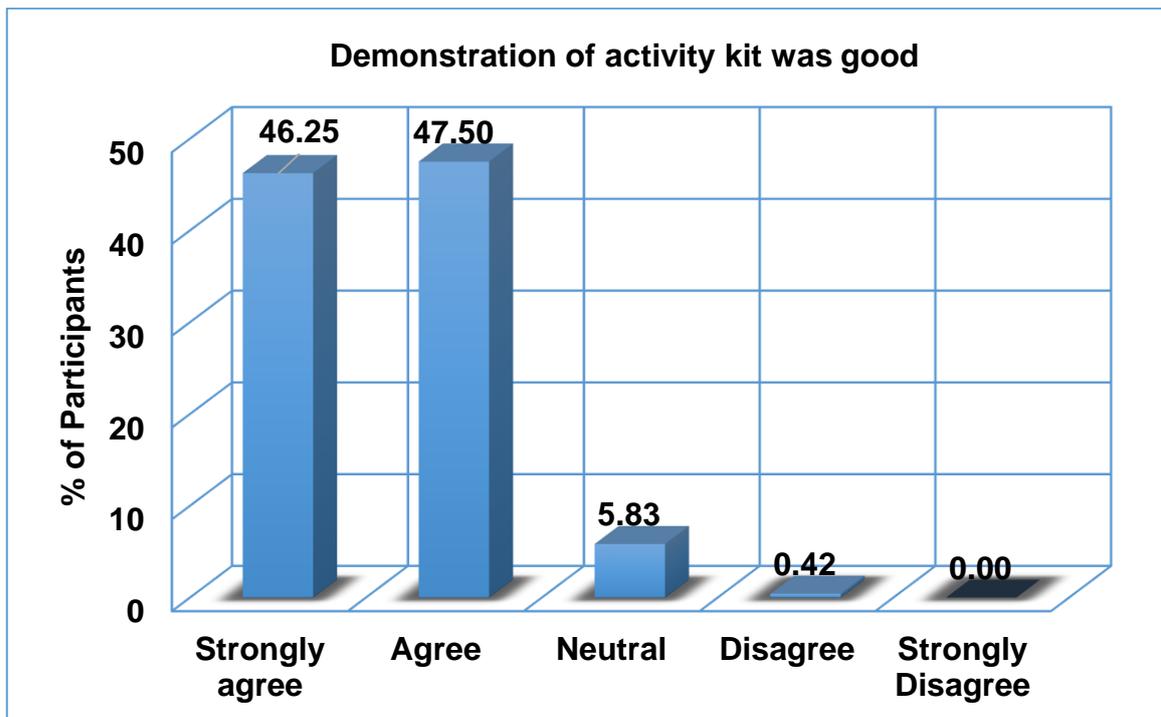
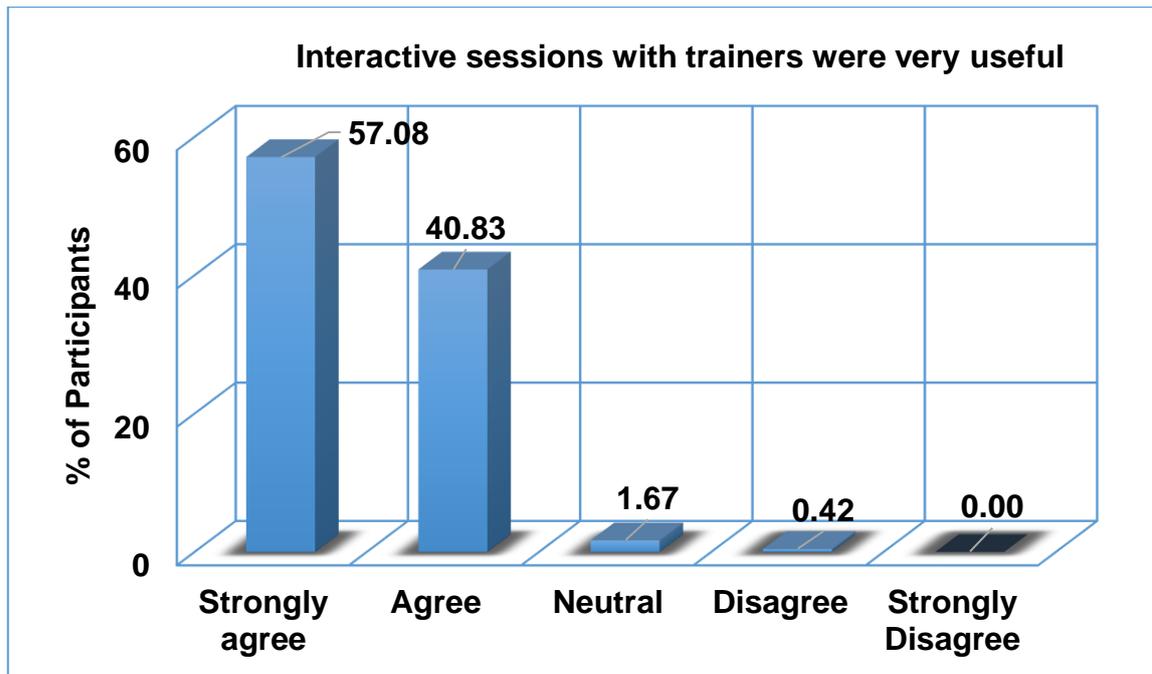




5. Interaction with trainers

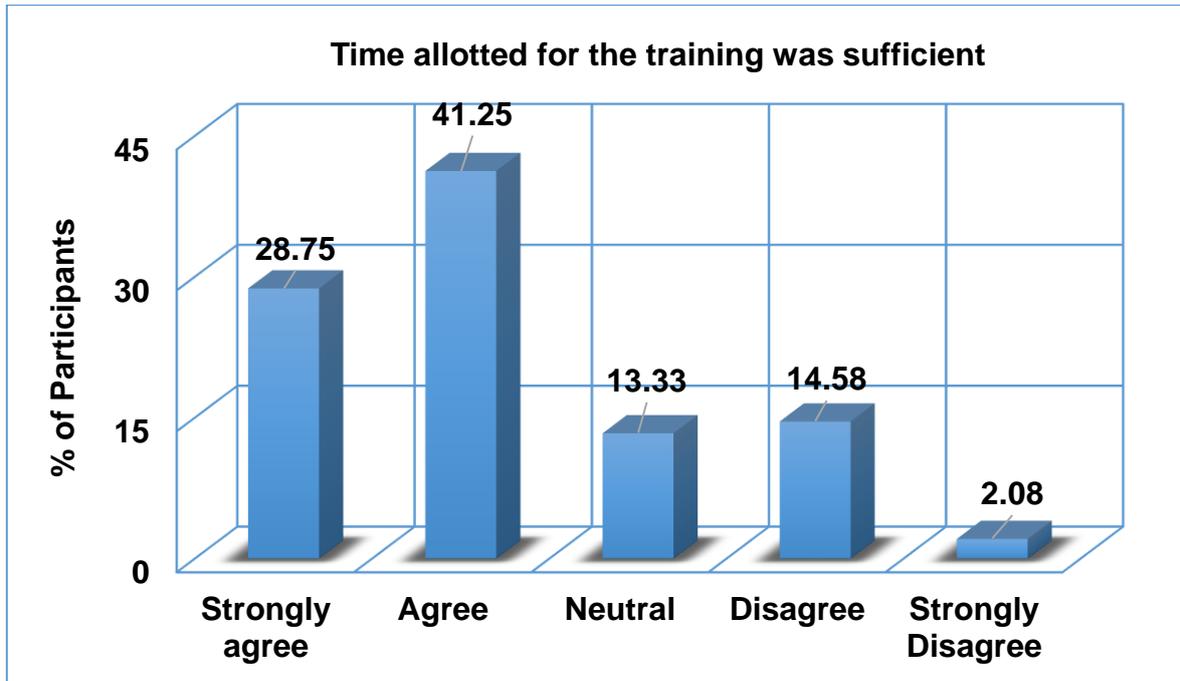
For the training programme to be a success, it is mandatory that there is ample interaction between the trainers and the participants. Special emphasis was laid down during this training to ensure that the participants engaged with the trainers as much as possible. Questions from participants were encouraged at all times, and to encourage them, prizes were given to answers of interesting questions posed by the trainers. This builds confidence in the participants to interact more. One full session was dedicated to demonstration of the science activity kit so that the teachers could repeat the same without any error.





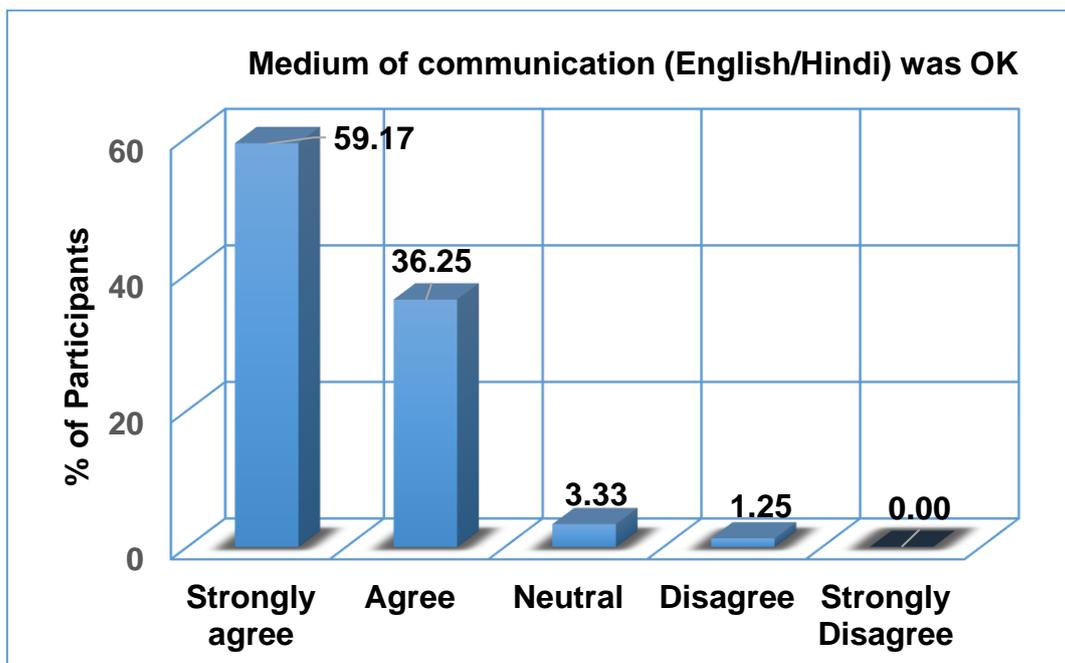
6. Time allotted for the training programme

While 70 % of the participants agreed that the 2 days allotted for the training programme was sufficient, 17% responded that the programme should have been longer, at least 3 days. We as trainers also realized that 2 days was not really sufficient, especially since participants wanted to spend more time with the hands-on experiments and wanted to have more interaction with trainers to understand how to develop hands-on experiments for teaching plasma. Future training programmes will be modified keeping this aspect in mind.



7. Choice of language for training

While the lectures were in English/Hindi and the posters and book were also printed in both the languages, we found that even in the Hindi dominated areas of North, East and Central India, there was more demand for the English versions and very few takes for Hindi versions. During these training programmes, no regional language resources were used. However, in future programmes, it is planned to generate the resource materials in regional languages also, with the help of respective state science councils.

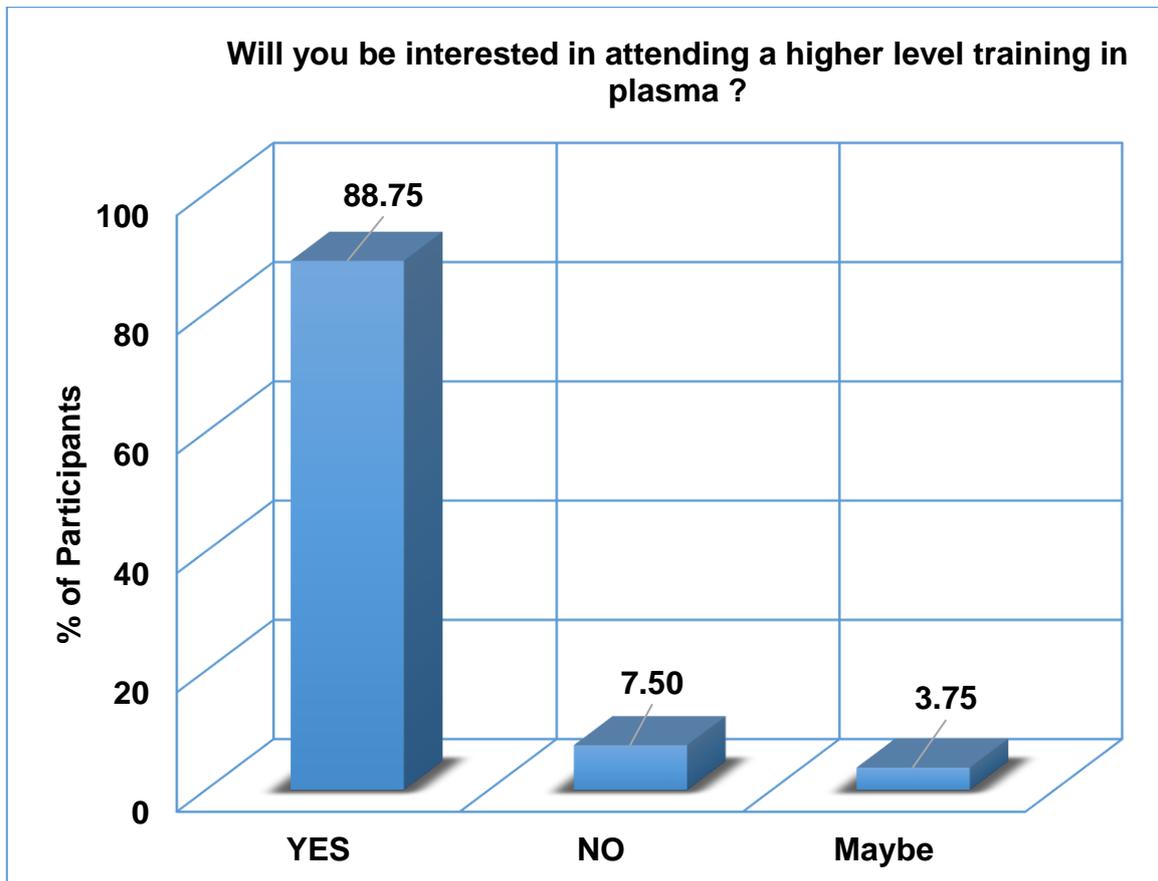


8. Interest in advanced training in Plasma

Due to the overwhelming response to this basic training programme, the participants were asked if they would be interested in a next-level advanced training on plasma. 88.75% of participants

responded that they would like to attend if such a programme were to be organized. Outreach Division of IPR is planning to design and conduct such a programme in the near future.

After the completion of the training programme, several teachers who were trained, conducted training programmes in their localities for students as well as other teachers. This is important as continuity of the programme is essential to ensure that more students are trained. Resource persons from IPR will offer technical assistance whenever required.



9. Participant Feedback Data

| No. | Feedback (241 / 250 Participants) | Agree (%) | Neutral (%) | Disagree (%) |
|-----|--|-----------|-------------|--------------|
| 1 | Objectives of the training were clearly defined | 95.83 | 2.50 | 1.67 |
| 2 | Lectures were simple and easy to understand | 95.83 | 3.75 | 0.42 |
| 3 | Topics covered were relevant to the training | 97.50 | 2.08 | 0.42 |
| 4 | The contents of the talks were well organized and easy to follow | 93.33 | 5.83 | 0.83 |
| 5 | The resource materials distributed will be helpful to introduce the topic of plasma to my students | 97.08 | 2.50 | 0.42 |
| 6 | The trainers were knowledgeable about the topic and could explain concepts very well. | 96.67 | 2.92 | 0.42 |
| 7 | Time allotted for the training was sufficient | 70.00 | 13.33 | 16.67 |

| No. | Feedback (241 / 250 Participants) | Agree (%) | Neutral (%) | Disagree (%) |
|-----|---|-----------|-------------|--------------|
| 8 | The experimental demonstrations of plasma were interesting and useful | 97.50 | 2.08 | 0.42 |
| 9 | The trainers were well prepared | 92.50 | 7.08 | 0.42 |
| 10 | Interactive sessions with the trainers were informative and useful | 97.92 | 1.67 | 0.42 |
| 11 | The training objectives were met | 95.83 | 3.33 | 0.83 |
| 12 | The quality of the posters provided were good | 96.67 | 3.33 | 0.00 |
| 13 | Scientific content in the posters were easy to understand | 95.42 | 4.58 | 0.00 |
| 14 | The quality of the science activity kit was good. | 92.08 | 6.67 | 1.25 |
| 15 | The various activities in the kit were easy to understand and to repeat. | 95.42 | 4.17 | 0.42 |
| 16 | Contents of the book "Living with Plasma" is simple and informative. | 96.67 | 3.33 | 0.00 |
| 17 | The resource materials in the DVD will be useful to teach plasma to students. | 94.17 | 5.83 | 0.00 |
| 18 | The training location and facilities were adequate and comfortable | 94.17 | 3.75 | 2.08 |
| 19 | There was ample opportunity to interact with the trainers during the training. | 95.00 | 3.75 | 1.25 |
| 20 | Accommodation provided was adequate and comfortable | 91.25 | 7.08 | 1.67 |
| 21 | Food provided during the training was adequate and of good quality | 95.42 | 3.75 | 0.83 |
| 22 | The demonstration and explanation of the science activity kit was good. | 93.75 | 5.83 | 0.42 |
| 23 | The medium of language (Hindi/English) used by the trainers was clear and understandable. | 95.42 | 3.33 | 1.25 |

| No. | Feedback (241 / 250 Participants) | YES (%) | NO (%) | Maybe (%) |
|-----|---|---------|--------|-----------|
| 24 | Would you like to attend an advanced training programme on Plasma in future? | 88.75 | 7.50 | 3.75 |
| 25 | Were you aware about Institute for Plasma Research before this training programme? | 43.75 | 56.25 | |
| 26 | Did you have difficulty in getting official leave to attend this training programme? | 9.58 | 90.42 | |
| 27 | Do you think that similar training programme should be organized at a district level in your home state ? | 82.50 | 17.50 | |

10. Conclusions & Future plans

From the feedback obtained after the completion of the training program, it can be concluded that the training programme managed to achieve its objectives, that is, to ensure that the teachers were

introduced to the topic and were given sufficient training so as to be able to train students. Having trained a total of around 250 teachers in the five training programmes, we expect these teachers to train, in turn over 100 students every year. However, in order to ensure that more teachers are trained, there should be a continuity of this programme, especially at district levels and with resource materials in the local language and more time allotted for the hands-on experiments. Communicating with teachers for such programme was the major hurdle in conducting this programme. The state science councils were not all that forthcoming in nominating participants. However, it must be mentioned that the Kerala State Physics Teachers' group on WhatsApp was found to be a very efficient method to reach out to the physics teachers in that state and disseminate information regarding the program and this was reflected in the high number of registrations that were received from Kerala.

IPR, as part of its outreach programme is planning to expand this training programme to state/district levels. Also, based on the feedback from participants, a higher-level training programme on plasma is also being planned for high school and graduate physics teachers.

11. Suggestions

- (a) Time for the training programme should be increased to three days in order to provide more time for hands-on experiments
- (b) This programme should be extended to district levels in different states with resource materials in the local languages.
- (c) More involvement of state science councils in organizing such training programmes.
- (d) Resource persons should help participants to build hands-on experiments

12. Acknowledgements

The PI, Co-PI and the members of this project team wish to thank the Director, Institute for Plasma Research, Gandhinagar for the administrative support as well as partial financial support for this programme. The authors acknowledge the NCSTC (DST) for partial financial support for this training programme.

The guidance from Dr. Vinay B Kamble, Former Adviser NCSTC/DST and Former Director, Vigyan Prasar, New Delhi, during the initial stages of the project is also gratefully acknowledged.

The team also wishes to acknowledge the members of PSCST, MPCOST, ASCST, NCSM, GUJCOST and KSCST for all the help rendered in organizing this training programme at the five respective venues.

Annexure-2

Newspaper reports

Newspaper report of the training event at Bhopal, M P



Annexure – 3

Continuity of the Programme

Several of the teachers trained in this programme have started introducing the topic of plasma science & technology to their students / teachers using the resource materials provided to them. Some of them are listed below. **This is one of the notable achievements of this project and clearly indicates the success and effectiveness of this training programme.**

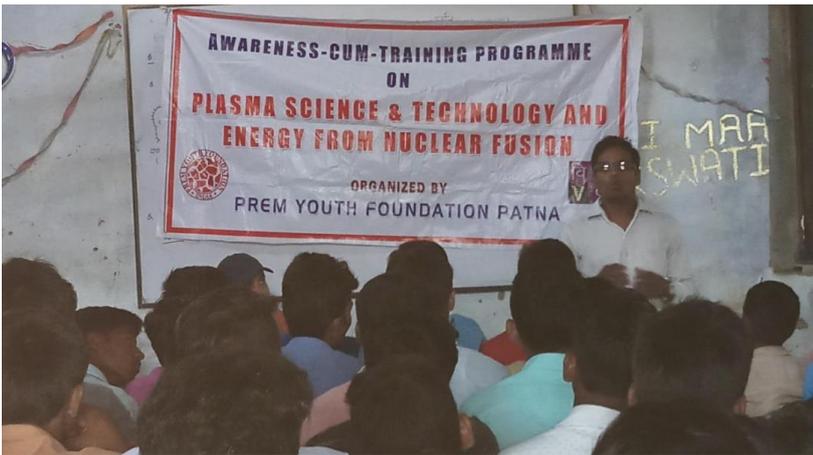
Shri. Lakshmi Kant Sharma from Shri Banwasi High School, Ekta Nagar who was trained in the Bhopal Training programme, conducted plasma Knowledge & popularization programmes at Sushil Mandal School, Bareilly, UP



Workshop on the topic of Plasma Science and Nuclear Fusion by Prem Youth Foundation was organized at Shivam School, Fulbaria, by Shri. Nitish Kumar who was trained at the Bhopal meeting. Four hundred students took part in the workshop conducted at this school.



A second workshop on Plasma Science and Nuclear Fusion was conducted by Shri Nitish Kumar at the Gyan Bharti Coaching Center, Khusarupur.



Shri. Ramesh Chandra Patel of Chhatrapati Shivaji Inter College, Gogidher, Milight, UP, who attended the Bhopal training programme, conducted introduction programme of plasma and its applications for students from villages around Philibit, UP.





Ms. Sangeeta Maun of Govt. Uctar Madhyamik Vidhyalaya, Bastar one of the teachers trained at the Bhopal meeting conducted “Plasma Bhowtik” for students.



Mrs. Anjali Mane of Kharghar, Maharashtra, who attended the Gandhinagar training programme conducted introductory lectures in plasma and its applications for 11th and 12th class students of the Ramsethi Public School, Kharghar using the resource materials provided to her during the Gandhinagar training programme.



She also conducted four other programmes for students in and around Navi Mumbai.

| Sr No | Name Of The School | Programme conducted on |
|-------|--------------------------------------|----------------------------------|
| 1. | Mahalakshmi Vidyala,Pimpalgeon,Akole | 25 th November, 2017 |
| 2. | Ramsheth Public School,Kharghar | To be conducted on 12 Dec,2018 |
| 3 | Kanya Shala,Akole | 28 th April, 2018 |
| 4. | Ramsheth Public School,Kharghar | 29 th September, 2018 |



रामशेठ ठाकूर पब्लिक स्कूलमध्ये विज्ञान कार्यशाळा

खारघर : रामप्रहर वृत्त-

जनार्दन भगत शिक्षण प्रसारक संस्थेच्या राष्ट्रीय महोत्सवानिमित्त रामशेठ ठाकूर पब्लिक स्कूल खारघर येथे विज्ञान कार्यशाळेतर्फे शनिवारी (२९ सप्टेंबर) प्रयोग, प्रात्यक्षिके आयोजित करण्यात आली होती. कार्यशाळेसाठी संस्थेतील अनेक शाळांतील विद्यार्थ्यांनी सहभाग घेतला होता.

अंजली माने यांनी विज्ञान कार्यशाळेत, विज्ञानातील अनेक प्रयोगाची प्रात्यक्षिके करून दाखविली व विद्यार्थ्यांकडून विज्ञान प्रयोगाची प्रात्यक्षिके करून घेतली. विद्यार्थ्यांनी स्वतः



हून सहभाग घेतल्यामुळे नवीन पद्धतीने शिकण्याचा आनंद लुटला. विद्यार्थ्यांनी घरी जाताना विज्ञानातील अनेक अनुभव, आठवणी, विज्ञानाबद्दलची माहिती घेऊन गेले. वरील विज्ञान कार्यशाळेसाठी, शाळेच्या

मुख्याध्यापिका राज अलोनी मंडम यांनी मोलाचे मार्गदर्शन केले. तसेच संस्थेचे चेअरमन लोकनेते रामशेठ ठाकूर यांनी विज्ञान कार्यशाळेसाठी हजर असलेल्या विद्यार्थ्यांना शुभेच्छा दिल्या.



Mr Panduru Venugopal, Physics Teacher from Govt High School, Srikakulam (AP)

On 5th August 2018, a participant from the training conducted at Bengaluru, Mr. Panduru Venugopal, physics teacher from Govt high school, Srikakulam, Andhra Pradesh, organized workshop for 65 Physical Science teachers. He explained the fourth state of matter i.e., plasma state, with live examples. He also informed them about applications of plasma in our daily life. Briefly explained what is ITER ,and objectives of ITER.



Participants live experience of plasma effects



Mr Venugopal also organized another workshop on 8th Oct 2018 for Zilla Parishad High School, G Sigadam, Srikakulam, AP, where, along with live plasma experiments, he also showed the video of the working of a fusion machine.

On 9th Oct 2018, one more workshop was organized by Mr. Venugopal for Sri Prakash Vidyaniketan, TPT Colony, Visakhapatnam for 110 students from 9th class and 25 Science teachers attended the workshop.



Mr. Nitish Kumar / Mr. Dilip Kumar of Nav Gyan Convent, Adilpur, Phatuha, Patna, who also runs Prem Youth Foundation, who was trained at the Bhopal training programme has introduced the topic of plasma to over 2000 students of several schools in the state of MP/ Bihar.



कार्यशाला का आयोजन

फतुहा। प्रेम यूथ फाउंडेशन की ओर से प्लाज्मा विज्ञान एवं न्यूक्लियर फ्यूजन के विषय पर कार्यशाला का



आयोजन शिवम इंटरनेशनल स्कूल के दशम वर्ग के छात्र छात्राओं ने भाग लिया। मौके पर उपस्थित रिसोर्स प्रशान नीतीश कुमार ने बताया कि प्लाज्मा हमारे लिए बहुत ही उपयोगी सिद्ध होगी आने वाले समय में जब प्राकृतिक संसाधनों का आभाव होगा या समाप्त हो जायेगी उस समय प्लाज्मा से ही सब कुछ होगा। उन्होंने बताया कि हम टमाटर को तीन से चार दिन ही रख सकते हैं लेकिन प्लाज्मा के लेप लगाने से यह महीनों तक खराब नहीं होगा। उन्होंने लोगों से वैज्ञानिक सोच अपनाने का सलाह दिया। मौके पर फाउंडेशन के संस्थापक प्रेम कुमार, स्कूल के प्राचार्य राजेश कुमार सिंह, दिलीप कुमार, देवानन्द कुमार, आशुतोष कुमार, अनिल राज, ब्रज मोहन, पंकज ने भी अपने-अपने विचार प्रकट किये।



प्लाज्मा साइंस एवं न्यूक्लियर फ्यूजन पर कार्यशाला आयोजित

दनियावां ■ संवाददाता

प्रेम यूथ फाउंडेशन की ओर से खुसरूपुर के ज्ञान भारती कोचिंग सेंटर में प्लाज्मा साइंस एवं न्यूक्लियर फ्यूजन के विषय पर कार्यशाला का आयोजन किया गया। इसमें दनियावां के छात्रों ने भी शिरकत की। मौके पर उपस्थित विज्ञान कर्मी नीतीश कुमार ने बताया कि पदार्थ की ठोस, द्रव्य और गैस के बाद की चौथी अवस्था को प्लाज्मा कहते हैं। वर्ष 2060 तक अधिकांश प्राकृतिक संसाधनों का अभाव हो जायेगा। पेट्रोल, डीजल, गैस की भारी किल्लत हो जायेगी तो प्लाज्मा हमारे लिए वरदान साबित होगी। प्लाज्मा से हम असाध्य रोगों का इलाज भी आसानी से कर सकते हैं। कृषि के लिए भी ये नयी तकनीक बहुत ही उपयोगी साबित हो रही है। हम टमाटर एवं फलों को प्लाज्मा से कोटिंग कर महीनों



खराब होने से बचा सकते हैं। इस मौके पर प्रेम यूथ के संस्थापक गांधीवादी प्रेम जी ने कहा कि सभी विद्यालयों में विज्ञान क्लब क्लब खोले जायेंगे। उन्होंने लोगों से वैज्ञानिक सोच अपनाने पर जोर देते हुए कहा कि आज जब अमेरिका मंगल ग्रह पर बसने की तैयारी कर रहा है तब भारत में लोग डायन, ओझा, भगत एवं बाबाओं के जाल में फंस कर अपना समय और धन बर्बाद कर रहे हैं। मौके पर साकार देव, उपेन्द्र सिंह, आकार निरंकर ने भी अपने विचार प्रकट किये। कार्यक्रम में सैकड़ों छात्र-छात्राओं ने भी भाग लिया।

प्रेम यूथ फाउंडेशन की ओर से प्लाज्मा साइंस एवं न्यूक्लियर फ्यूजन के विषय पर आयोजित कार्यक्रम की प्रतिवेदन :

- 1) स्थान शिवम इंटरनेशनल स्कूल, फुलबरिया, पटना
प्रतिभागियों की संख्या 640, प्रोग्राम ऑफिसर नीतीश कुमार
- 2) स्थान उज्जवल वर्ड स्कूल, हरदासबीघा, पटना
प्रतिभागियों की संख्या 365, प्रोग्राम ऑफिसर गोपी कुमार
- 3) स्थान विराट साइंस क्लब, खुसरूपुर, पटना
प्रतिभागियों की संख्या 278, प्रोग्राम ऑफिसर दिलीप कुमार
- 4) वाल विकास सहयोगी स्कूल, आदिलपुर, पटना
प्रतिभागियों की संख्या 196, प्रोग्राम ऑफिसर दीपक कुमार
- 5) मल्टी प्वाइंट साइंस क्लब, फतुहा, पटना, प्रतिभागियों की संख्या 345
प्रोग्राम ऑफिसर नीतीश कुमार
- 6) मिलेनियम साइंस क्लब, सम्मसपुर, फतुहा, प्रतिभागियों की संख्या 234
प्रोग्राम ऑफिसर राहुल कुमार

Shri. Laxmikant Sharma of Shri Banwasi High School, Gali No. 5, Ekta Nagar, MP conducted several training programme in plasma for students.

दिनांक 11 मई राष्ट्रीय प्रौद्योगिकी दिवस के अवसर पर व 12 मई को कार्यक्रमों का आयोजन किया गया वर्क कक्षा 10 11 12 के छात्रों छात्राओं को प्लाज्मा के बारे में जानकारी दी गई। आने वाला कल प्लाज्मा पर ही निर्भर करेगा।। विद्यालयों में मेरे द्वारा पोस्टरस वह पुस्तकें विद्यालय को हिसाब से से दी गई निरंतर विद्यालय में चर्चा होती रहे आगे और भी कार्यक्रम प्रस्तावित है उचित होगा कि हिंदी में दैनिक जीवन में प्लाज्मा 20 पुस्तक पोस्टर कैसेट वाइट उपलब्ध करा दें जिससे कार्यक्रम और प्रभावी हो सके। मीडिया ने कार्यक्रम को बहुत महत्व दिया है।



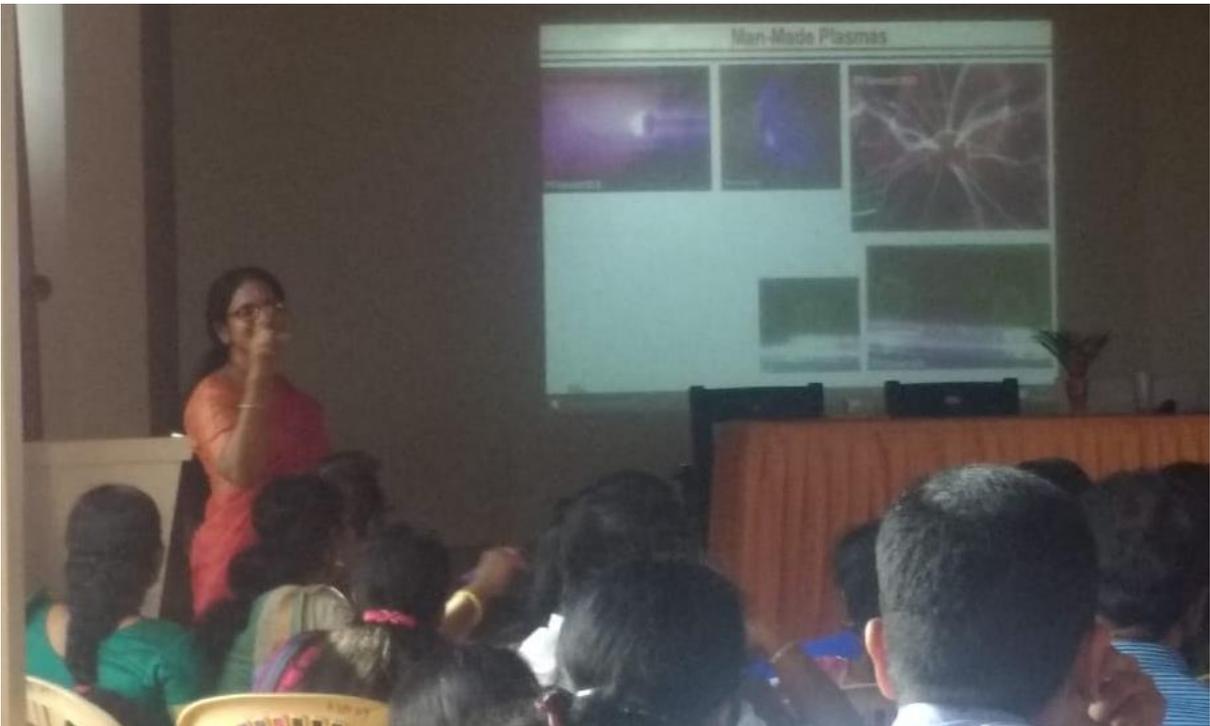
Mr. Pritam Singh from Govt HSS Akingam, Anantnag, Srinagar conducted a training programme for students at his school.



Shri. Rajeev Kumar, Govt. Sen. Sec. School, Chandrahan, District-Mandi, H.P, who attended the Chandigarh training programme, conducted a training programme on plasma and its applications for students on 24 April 2018.



Ms. Jyothi Pradeep of Bhavan's Vidya Mandir (BVM), Girinagar, Kochi, who was training at the Bangalore meeting, held a series of training programme on plasma and its applications for science teachers of the various BVM schools in Kochi.



Mr. Prabhakar P from ZPHS, Mandipeta Kotur, Palamaner, Chittoor Dt. (AP), who attended the training at Bengaluru conducted interactive classes in plasma for students of 11th and 12th class from Gove Govt Model School:



Mr. Kodai Anilkumar from ARN College Gudivada, Bhushanagulla 521302, who attended the Bengaluru training, conducted training programme for 11 and 12th students on plasma using plasma globe during JNANABHERI education summit at Vijaywada on 20-9-2018



Ms. Beena Antony from Christ Junior college, Hosur Road, Bangalore - 560029, Karnataka, who attended the training at Bengaluru explained concepts of plasma and its applications to high school students using interactive experiments.



Mr. Kirubananad N. from Bhagavathy Govt Hr. Sec. School, Vannamadai, Palakkad, Kerala, who attended the training programme at Bengaluru displayed the posters of plasma permanently in the physics lab. Students were learning the matters at their own interest. Questions about plasma were answered by the teacher. A detailed seminar on plasma is being planned.



Ms. Maryan Francis Pearl from Government Appavu Pillai High School Elappully, Palakkad, Kerala, who attended the training programme at Bengaluru, conducted lectures for students of her school on plasma and its applications.



Mr. Rajkumar Nabakumar Singh, from Mangolganbi College Ningthoukhong, Manipur, who attended the training programme at Guwahati, conducted training for students of plus 11th and 12th.



Ms. Pavitra N. R. from Sree Krishna Higher Secondary School, Nallepilly , Palakkad, who attended the training programme in Bengaluru, encouraged students of class 11th of her school to develop an exhibit based on applications of plasma, ie, Plasma Pyrolysis. Their exhibit was selected for display at the district level science fair.



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Annexure -4**List of All Participants**

| IPR-NCSTC Awareness-Cum-Training Programme on Plasma Science & Technology and Energy from Nuclear Fusion | | | | | | |
|---|--------------------------------|--------------|-------------------------|------------|------------|--|
| No. | Name of the Participant | State | Meeting Location | Age | M/F | Name & address of School / College of the participant |
| 1 | Abhilasha Jain Bhangre | MP | Bhopal | 47 | F | Govt. H.S. School, Khajri, Chhindwara |
| 2 | Amar Nath Singh | UP | Bhopal | 63 | M | Kendriya Vidyalay Sangathan/Raj English School, Rajgarh, Mirzapur |
| 3 | Anil Kumar | UP | Bhopal | 46 | M | Krashak Samaj Engg. College, Gola Khiri |
| 4 | Anil Kumar Tiwari | CG | Bhopal | 53 | M | Govt. Boys Uchar Madhyamik Shala, Sarkanda, Bilaspur |
| 5 | Anurag Chaurasia | MP | Bhopal | 23 | M | Research Scholar in Department of Anthropology, Dr. Hari Singh Gour Central University Sagar |
| 6 | Anurag Pandey | MP | Bhopal | 42 | M | Govt. Uchar Madhyamik School, Jaruvakheda, Sagar |
| 7 | Arvind Kumar Verma | UP | Bhopal | 45 | M | Rajkiya Jubilee Easter College, Near City Railway Station, Lucknow |
| 8 | Ashok Singh Rajput | MP | Bhopal | 28 | M | Tagore Public Hr. Sec. School, Near Chatri Mandir, Seoni, Malwa, Hoshangabad |
| 9 | Bajrangi Jha | UP | Bhopal | 54 | M | Saraswati Shishu Mandir Varishth Madhyamik Vidhyalaya, Shubhashchandra Bose Nagar, Surya Kund, Gorakhpur |
| 10 | Bharti Dwivedi | MP | Bhopal | 47 | F | Govt. Shubhash Uchar Madhyamik Excellence School, Bhopal |
| 11 | Brajesh Dixit | UP | Bhopal | 68 | M | Shri Narayan Engg. College, Vipnet Club, Vadera |
| 12 | Chandrashekhar Prasad | JH | Bhopal | 26 | M | Eklavya Public School, Salona, B, Devghar |
| 13 | Deepak Devangan | CG | Bhopal | 47 | M | Govt. H.S. School, Sankra, Block Pithora |
| 14 | Devanand Kumar | BR | Bhopal | 39 | M | Radha Krishna High School, Baikathpur, Patna 803205 |
| 15 | Devesh Kumar | UP | Bhopal | 29 | M | U.P.S. Bhagwamtpur, Vikas Khand, Sakel Eta |
| 16 | Dilip Kumar | BR | Bhopal | 29 | M | Gyan Bharti H.S. School, Khushrepur |
| 17 | Dinesh Kumar Sharma | MP | Bhopal | 42 | M | Govt. Excellence HSS, Sehore, MP |
| 18 | Dinesh Kumbhkar | MP | Bhopal | 43 | M | Govt. H.S. School, Tanodia, Agara, Malwa |
| 19 | Gajendra Singh Patel | MP | Bhopal | 45 | M | SICA S.S. School No. 2, Scheme No. 54, Vijay Nagar, Indore |
| 20 | Ghanshyam Yadu | CG | Bhopal | 38 | M | Govt. Adarsh Uchar Madhyamik Vidhyalaya, Mahasamund |
| 21 | Humraj Patle | MP | Bhopal | 51 | M | Govt. Excellence School, Balaghat |
| 22 | Koushal Kishore Choubey | MP | Bhopal | 45 | M | P.L.S.B.S. Model Uchar Madhyamik School, Near High Court, Jabalpur |

| No. | Name of the Participant | State | Meeting Location | Age | M/F | Name & address of School / College of the participant |
|-----|--------------------------|-------|------------------|-----|-----|--|
| 23 | Kundan Kumar | BR | Bhopal | 26 | M | Sarvodya High School, Phatuha (Patna) |
| 24 | Lalit Mehta | MP | Bhopal | 48 | M | Govt. School of Excellence, Sagod Road, Ratlam |
| 25 | Luxmi Kant Sharma | UP | Bhopal | 63 | M | Shri Banwasi High School, Gali No. 5, Ekta Nagar |
| 26 | Mahendra Kothari | MP | Bhopal | 54 | M | Campion School, Bhopal |
| 27 | Manoj Kumar | UP | Bhopal | 45 | M | JHS Sisola Kalan Jani, Meerut |
| 28 | Mohd. Shahid Ansari | MP | Bhopal | 42 | M | Govt. High School, Khirsageh, Panransiya, Chhindwara |
| 29 | Mukesh Nigam | MP | Bhopal | 42 | M | Govt. Excellence School, Dewas |
| 30 | Narendra Singh | UP | Bhopal | 22 | M | National Young Science Club, Mahoba, Gandhinagar, Mahoba |
| 31 | Neha Nath | CG | Bhopal | 45 | F | Govt. H. Sec. School, Kuakonda, Dantewada |
| 32 | Nitish Kumar | BR | Bhopal | 26 | M | Nav Gyan Convent, Adilpur, Phatuha, Patna |
| 33 | Pawan Kishore Sharan | BR | Bhopal | 54 | M | CMG High School, Bhagalpur, Bihar |
| 34 | Prem Kumar | BR | Bhopal | 44 | M | P.P. Public School, Ashok Nagar, Patna |
| 35 | Rajesh Kumar | UP | Bhopal | 50 | M | Dr. Ambedkar Institute of Technology for Handicaped, Avadhपुरi, Kanpur |
| 36 | Rajneesh Porwal | MP | Bhopal | 46 | M | Govt. H.S. School, Siya |
| 37 | Raju Singh | UP | Bhopal | 28 | M | U.P.S. Rajthal Block, Isha Nagar |
| 38 | Ramanand Prasad Singh | BR | Bhopal | 58 | M | National College, Barauli, Gopalganj, Bihar |
| 39 | Ramesh Chandra Patel | UP | Bhopal | 27 | M | Chhatrapati Shivaji Inter College, Village+Post = Gogidher, Milighit, UP |
| 40 | Ravi Pratap Singh | UP | Bhopal | 26 | M | Anglo Vedic Convent School, Bahjoi (Sambhal) |
| 41 | Sadhana Singh | UP | Bhopal | 37 | F | Govt. Girls Inter College, Hoshiyarpur, Goutambudh Nagar |
| 42 | Sangeeta Maun | CG | Bhopal | 56 | F | Govt. Uctar Madhyamik Vidhyalaya, Bastar |
| 43 | Sanjay Kumar Upadhyay | UP | Bhopal | 48 | M | Rajkiya Easter College, Pailani |
| 44 | Sanjay Sharma | UP | Bhopal | 42 | M | Vidhya Mandir Inyter College, Shastri Nagar, Mertha |
| 45 | Sanjiv Kumar | BR | Bhopal | 48 | M | CKK High School, Kairia, Kahalgaon, Bhagalpur, Bihar |
| 46 | Satyabhan Singh Bhadoria | MP | Bhopal | 47 | M | Govt. Uctar Madhyamik School, Bhind |
| 47 | Shivendra Kumar Parihar | MP | Bhopal | 49 | M | P.L.S.S.S. Model Uctar Madhyamik School, Near High Court, Jabalpur |
| 48 | Shoeb Khan | MP | Bhopal | 44 | M | Govt. Girls H.S. School, Pipliya Mandi, Mandsaur |
| 49 | Upkar Dutt Sharma | UP | Bhopal | 45 | M | Adarsh Inter College, Nali Husainpur, Hapuda |
| 50 | Aboobacker Siddiq V. K. | KL | Bangalore | 48 | M | PTMHSS Thrikkatiri, Thrikkatiri P.O, Palakkad Dt. Kerala |
| 51 | Aboothahir Afzal | KL | Bangalore | 36 | M | Govt. arts and Science college, Kozhikode-673018, Kerala |
| 52 | Ajith Sankar K. | KL | Bangalore | 41 | M | CHSS Chalavara, Chalavara PO, Palakkad 679505 |
| 53 | Anil Kumar K. | AP | Bangalore | 44 | M | ARN College Gudivada, Bhushanagulla 521302 |
| 54 | Aparna L. R. | KL | Bangalore | 35 | F | Department of Physics, TKM College of Arts and Science, Kollam |

| No. | Name of the Participant | State | Meeting Location | Age | M/F | Name & address of School / College of the participant |
|-----|----------------------------|-------|------------------|-----|-----|--|
| 55 | Arulalan | TN | Bangalore | 38 | M | Govt. High School, Vadukampatti, Salem Dt. |
| 56 | Bahuguna Saradhi B V | TG | Bangalore | 56 | M | Wesley Boys Jr. College, Secunderabad |
| 57 | Basim M. B. | KL | Bangalore | 32 | M | PSMO College, Tirurangani, Malappuram 676306, Kerala |
| 58 | Beena Antony | KA | Bangalore | 47 | F | Christ Junior college, Hosur Road, Bangalore - 560029, Karnataka, India |
| 59 | Bhagiratha Somayaji | KA | Bangalore | 23 | M | Chendady House, Jodumarga Banhuala-574219 |
| 60 | Bharani Kumar | TG | Bangalore | 37 | M | ZPHS, Dudivenkatapur, Yadadri Bhongir Dist |
| 61 | Channappa K. M. | KA | Bangalore | 42 | M | Govt Junior College Devanahalli. Bangalore Rural Dist. |
| 62 | Chithira M. S. | KL | Bangalore | 34 | F | TKM Centenary Public School, Karicode, Kollam - 691005 |
| 63 | Chithranjan Das B. | AP | Bangalore | 48 | M | Noble College, Machilipatanam 521001 |
| 64 | Deepak C. Cherikallingal | KL | Bangalore | 34 | M | Govt Boys Higher secondary school Malappuram |
| 65 | Dineshan.T | KL | Bangalore | 41 | M | Government Sanskrit Higher Secondary School, Vadakara, Kozhikkode, Kerala, 673104 |
| 66 | E. Manikandan | KA | Bangalore | 40 | M | Dept. of Physics, Thiruvalluvar University, College of Arts and Science, Thennangur-604408 |
| 67 | Ganesh | KA | Bangalore | 24 | M | IISc, Bangalore |
| 68 | Geetha Thankam V. T. | KL | Bangalore | 44 | F | Govt.Higher Secondary School, Mezhathur, Palakkad Dist, Kerala - 679 533 |
| 69 | Gurunatha Rao V. | TG | Bangalore | 47 | M | ZPHS, Kambalapalli, Mahabubabad Dist |
| 70 | Gurusiddappa J. | AP | Bangalore | 42 | M | B.I.T-I.T, Hindupur, Andhra Pradesh |
| 71 | Hareeshkumar K. | KA | Bangalore | 37 | M | Government High School, Malavalli TQ,Mandya Dt,Huskur |
| 72 | Harith Unnikrishnan | KA | Bangalore | 23 | M | IISc, Bangalore |
| 73 | Hashim Firoz C. H. | KL | Bangalore | 27 | M | PTMHSS Thrikkatiri, Thrikkatiri P.O, Palakkad Dt. Kerala |
| 74 | Jagadeshchandra bharani | KA | Bangalore | 25 | M | IISc (CCT) |
| 75 | Jayaraj K. | KL | Bangalore | 41 | M | Parudur Higher Secondary School,Pallippuram, Karambathur P.O, Palakkad Dt.679305 |
| 76 | Jincy Poulouse | KL | Bangalore | 38 | F | North American International school.Mizhar 1,AI Khawaneej Behind Arabian Center - Dubai. |
| 77 | Jincy Thomas | KL | Bangalore | 43 | F | Kerala government Poly Technic College Kozhikode ,Westhill, Kozhikode 673005 |
| 78 | Jyothi Pradeep | KL | Bangalore | 44 | F | Bhavan's Vidya Mandir,Girinagar Kadavanthara P O,Kochi 682020 |
| 79 | Kingson Solomon Jeevaraj A | TN | Bangalore | 39 | M | Department of Physics, LRG Government Arts College for Women, Tirupur 641 604 |
| 80 | Kirubanand N | KL | Bangalore | 42 | M | Bhagavathy Govt Hr. Sec. School, Vannamadai , Palakkad, Kerala – 678555 |
| 81 | Krishna Mohan N | AP | Bangalore | 50 | M | ARN College Gudivada, Bhushanagulla 521301 |

| No. | Name of the Participant | State | Meeting Location | Age | M/F | Name & address of School / College of the participant |
|-----|-------------------------|-------|------------------|-----|-----|--|
| 82 | Lajo Shaji | KA | Bangalore | 25 | M | IISc, Bangalore |
| 83 | Madesh Kumar M. | KA | Bangalore | 42 | M | Reva University, Yelahanka, Bangalore 560064 |
| 84 | Madeshkumar Kumar | KA | Bangalore | 42 | M | Reva University, Yelahanka, Bangalore 560064 |
| 85 | Madhukar K. | TG | Bangalore | 44 | M | ZPSS, Areguda, Komarambheem Asifabad Dist. |
| 86 | Manikandan V.P.G. | TN | Bangalore | 33 | M | Govt. Higher Secondary School Thamaraipalayam, Erode Dt. |
| 87 | Manju L. | KL | Bangalore | 40 | F | TKM Centenary Public School, Karicode, Kollam - 691005 |
| 88 | Marutha Senthil S. | TN | Bangalore | 41 | M | Government Arts College, Udumalpet, Tirupur 642 126, TN |
| 89 | Maryan Francis | KL | Bangalore | 43 | F | Government Appavu Pillai High School Elappully , Elappully, Palakkad, 678622. |
| 90 | Mayakrishnan M. | TN | Bangalore | 39 | M | Govt. Higher Sec School, Viringapuram, Vellore District |
| 91 | Mayur A Shetti | KA | Bangalore | 24 | M | IISc, Bangalore |
| 92 | Mohamed Sherif K. | KL | Bangalore | 38 | M | Govt. HSS Irimbiliyam, Valiyakunnu Po, Malappuram Dist, Kerala - 676552 |
| 93 | Mohammed Salim. M | KL | Bangalore | 35 | M | Department of Physics,TKM College of Arts and Science, Kollam |
| 94 | Muhammed Abdurahman K | KL | Bangalore | 33 | M | MES Ponnani College Ponnani South PO, Malappuram 679586, Kerala |
| 95 | Muhammed Shafi | KL | Bangalore | 27 | M | T.K.M. collee & engineers, Kollam, Kerala` |
| 96 | Narasaiah J. R. | KA | Bangalore | 54 | M | J R Government High School Kanasavadi, Doddaballapur |
| 97 | Parvathalu K. | TG | Bangalore | 41 | M | Jr.Lecturer in Physics, Govt. Jr.College, Rajendranagar, Hyderabad |
| 98 | Prabhakar P. | AP | Bangalore | 45 | M | School Assistant, ZPHS, Mandipeta Kotur, Palamaner, Chittoor Dt. |
| 99 | Pramodan.P | KL | Bangalore | 42 | M | Government Vocational Higher Secondary School, Kadiroor, Thalassery, Kannur,Kerala, 670691 |
| 100 | Prasad R. N. A. | AP | Bangalore | 37 | M | ARN College Gudivada, Bhushanagulla 521303 |
| 101 | Pravitha N. R. | KL | Bangalore | 38 | F | Sree Krishna Higher Secondray School (09124), Nallepilly , Palakkad |
| 102 | Preeth M V | KA | Bangalore | 25 | F | IISWc, Bangalore |
| 103 | Rajarathinam L. | TN | Bangalore | 47 | M | Govt. Higher Secondary school, Valasaiyur, Salem |
| 104 | Rajeev Gopalan Nair | TN | Bangalore | 43 | M | Atomic Energy Central School, Kudankulam, Tirunelveli District, TN |
| 105 | Ramana Rao V. | TG | Bangalore | 53 | M | Principal, Govt. Jr. College, Dindi, Nalgonda |
| 106 | Rishabh Singh | KA | Bangalore | 21 | M | IISc, Bangalore |
| 107 | Roopa H Narayan | TN | Bangalore | 46 | F | K C High, OMR, Olympia Panache, Navalur, Chennai |
| 108 | Safir T. K. | KL | Bangalore | 29 | M | Department of Physics,TKM College of Arts and Science, Kollam |

| No. | Name of the Participant | State | Meeting Location | Age | M/F | Name & address of School / College of the participant |
|-----|-------------------------|-------|------------------|-----|-----|---|
| 109 | Santhosh Thatikonda | TG | Bangalore | 34 | M | Indus International School, Kondakal Village, Rangareddy District, Shankarpally, Telangana 501203 |
| 110 | Sanuja V. J. | KL | Bangalore | 36 | F | GHSS Tholanur, Tholanur PO., Palakkad 678722, Kerala |
| 111 | Sathiya Kumar R. | TN | Bangalore | 37 | M | Govt. High School Kappal Vaadi, Krishnagiri District |
| 112 | Selvakumar K. | TN | Bangalore | 34 | M | Bannari Amman Institute of Technology, Alathukombai PO, Sathyamangalam 638401 |
| 113 | Sharath Krishna P. | TG | Bangalore | 53 | M | ZPHS, Sallonipalli, Mahaboobnagar Dist |
| 114 | Smitha D. Pillai | KL | Bangalore | 38 | F | TKM Centenary Public School, Karicode, Kollam - 691005 |
| 115 | Sreenivas Vineel M. | AP | Bangalore | 38 | M | School Assistant, ZPHS, Kandregula, Pedapudi (M) |
| 116 | Srinivasan R. | TN | Bangalore | 57 | M | Tamilnadu State Council for Science and Technology, DOTE Campus, Chennai -25 |
| 117 | Sudakar S | TN | Bangalore | 43 | M | Govt. Higher Secondary school, Anjoor Jagadevi, Krishnagiri Dt. |
| 118 | Sundaraj P.B.T | TN | Bangalore | 51 | M | Govt. High School Kasapapettai, Erode Dt. |
| 119 | Umamahesha A | KA | Bangalore | 38 | F | Govt. High School, Hebbagodi, Ankeltq, Bangalore South |
| 120 | Venu Gopal P. | AP | Bangalore | 50 | M | School Assistant, ZPHS, Pogiri, Rajaam. |
| 121 | Visweshwara Rao N.V.K. | TG | Bangalore | 56 | M | Principal, Govt, Jr. College, Vijayanagar Colony, Hyderabad |
| 122 | Vivek G.A. | KA | Bangalore | 28 | M | CCT, IISc, Bangalore |
| 123 | Ajay Sharma | HP | Chandigarh | 44 | M | Govt. Sen. Sec. School, Jakhera, District–Una, H.P. |
| 124 | Amandeep Deora | PB | Chandigarh | 34 | M | Govt. Middle School Ghaniewala Tehsil – Kotkapura, District – Faridkot - 151207 |
| 125 | Amit Mittal | HR | Chandigarh | 44 | M | GM Sanskriti Sr. Sec. School, Taraori, District - Karnal, Haryana |
| 126 | Amreesh Sharma | HP | Chandigarh | 43 | M | District Science Supervisor, Solan, H.P. |
| 127 | Arshad Hussain | JK | Chandigarh | 46 | M | Govt. Model Higher Sen. Sec. School, Kishtwar, J&K |
| 128 | Arun Gupta | JK | Chandigarh | 47 | M | GHSS, Bhalwal, Jammu |
| 129 | Ashwani Chandel | HP | Chandigarh | 52 | M | Govt. High School, Ghiyal, District – Bilaspur, H.P. |
| 130 | Binoy Bhattacharjee | CH | Chandigarh | 53 | M | Govt. Model Sen. Sec. School, Sector-46, Chandigarh |
| 131 | Deep Shikha | PB | Chandigarh | 39 | F | SGTB Khalsa College, Sri Anandpur Sahib Punjab |
| 132 | Deepa | HR | Chandigarh | 54 | F | Govt. College for Women, Rohtak, Haryana |
| 133 | Deepak Kumar | PB | Chandigarh | 35 | M | Govt. Sen. Sec. School, Daroli Bhai, District - Moga |
| 134 | Deepak Sharma | HP | Chandigarh | 43 | M | Lecturer-Physics, Govt. Sen. Sec. School, Sirkund, District – Chamba, H.P. |

| No. | Name of the Participant | State | Meeting Location | Age | M/F | Name & address of School / College of the participant |
|-----|-------------------------|-------|------------------|-----|-----|---|
| 135 | Dev Kumar | HP | Chandigarh | 42 | M | Govt. Sen. Sec. School, Nirmand, District –Kullu, H.P. |
| 136 | Hardeep Kaur | CH | Chandigarh | 48 | F | Govt. Model Sen. Sec. School, Dhanas, Chandigarh |
| 137 | Jasvinder Kaur | PB | Chandigarh | 47 | F | Govt. Sen. Sec. School (Boys), Karandi, District – Mansa, Punjab |
| 138 | Jasvinder Singh | CH | Chandigarh | 32 | M | Lecturer – Physics, Govt. Model Sen. Sec. School, Sector – 22 (A), Chandigarh |
| 139 | Jaswinder Sigh | PB | Chandigarh | 51 | M | Govt. Sen. Sec. School, Sekhupur, District – Patiala |
| 140 | Joginder Kumar | HP | Chandigarh | 48 | M | Govt. Boys Sen. Sec. School, Lalpani, District – Shimla, H.P. |
| 141 | Karamjit Singh | PB | Chandigarh | 42 | M | Govt. Sen. Sec. School (Boys), Kotkapura, District – Faridkot, Punjab |
| 142 | Madan Lal | HP | Chandigarh | 45 | M | Govt. Sen. Sec. School, Berthin, District – Bilaspur, H.P. |
| 143 | Nalini Raina | JK | Chandigarh | 45 | F | GHSS, Bhalwal, Jammu |
| 144 | Neelam Sheoran | HR | Chandigarh | 54 | F | Govt. College for Women, Rohtak, Haryana |
| 145 | Om Parkash | CH | Chandigarh | 42 | M | TGT – Physics, Govt. Model Sen. Sec. School – MHC, Manimajra, Chandigarh |
| 146 | Om Prakash Verma | HP | Chandigarh | 44 | M | Govt. Sen. Sec. School, Bajaura, District–Kullu, H.P. |
| 147 | Paramjeet Singh | CH | Chandigarh | 51 | M | Govt. Model Sen. Sec. School, Sector - 8 (B), Chandigarh |
| 148 | Pardeep Singh | CH | Chandigarh | 52 | M | TGT Science, Govt. Model Sen. Sec. School, Sector – 40 (B), Chandigarh |
| 149 | Parveen Kumar | HR | Chandigarh | 32 | M | Govt. Sen. Sec. School, Patli Dabar, District - Sirsa, Haryana |
| 150 | Pawan Kumar | HP | Chandigarh | 47 | M | Govt. Sen. Sec. School, Kohlari, District – Chamba, H.P. |
| 151 | Pawan Thakur | HP | Chandigarh | 41 | M | Govt. Sen. Sec. School, Lalpani, District – Shimla, H.P. |
| 152 | Pritam Singh | JK | Chandigarh | 58 | M | GHSS Dhakhar, J&K |
| 153 | Raj Kumar Parashar | HP | Chandigarh | 47 | M | Govt. Sen. Sec. School, Deothi, District-Solan, H.P. |
| 154 | Rajan Bharti | JK | Chandigarh | 40 | M | GMS Sudhmahadev, District – Udhampur Jammu |
| 155 | Rajeev Kumar | HP | Chandigarh | 41 | M | Govt. Sen. Sec. School, Chandrahan, District-Mandi, H.P. |
| 156 | Rajiv Kr. Shukla | HP | Chandigarh | 41 | M | Govt. Sen. Sec. School, Sarahan, District – Sirmour, H.P. |
| 157 | Rakesh Bansal | HP | Chandigarh | 43 | M | Govt. Sen. Sec. School, Paonta Sahib, District –Sirmour, H.P. |
| 158 | Rakesh Kr. Walia | HP | Chandigarh | 45 | M | Govt. Sen. Sec. School, Gahlain, District – Kangra, H.P. |
| 159 | Rakesh Ramgotra | JK | Chandigarh | 36 | M | Govt. High Sen. Sec. School, Nagrota, Jammu |
| 160 | Ran Singh | HR | Chandigarh | 58 | M | Retd. Science Teacher, 102, Patel Nagar, Bhiwani, Haryana |
| 161 | Ranjeet Kumar | JK | Chandigarh | 35 | M | GHS, Hathal, J&K |
| 162 | Sachin Thakur | HP | Chandigarh | 41 | M | Govt. Sen. Sec. School, Sarkaghat, District – Mandi, H.P. |

| No. | Name of the Participant | State | Meeting Location | Age | M/F | Name & address of School / College of the participant |
|-----|-------------------------|-------|------------------|-----|-----|--|
| 163 | Sakshi Katyal | DL | Chandigarh | 33 | F | Salwan Public School, Rajendra Nagar, New Delhi-110061 |
| 164 | Sanjeev Rana | HP | Chandigarh | 40 | M | Govt. Sen. Sec. School, Shahpur, District Kangra, H.P. |
| 165 | Sukhdev Singh | PB | Chandigarh | 38 | M | Govt. Girls Sen. Sec. School, Kot Ise Khan, District – Moga - 142043 |
| 166 | Susheel Kumar | JK | Chandigarh | 37 | M | Govt. High Sen. Sec. School, Baja Bain, Jammu |
| 167 | Sushil Katna | HP | Chandigarh | 43 | M | Govt. Sen. Sec. School, Karot, Tehsil – Sujanpur, District –Hamirpur, H.P. |
| 168 | Vani Ranga | DL | Chandigarh | 33 | F | Salwan Public School, Rajendra Nagar, New Delhi-110060 |
| 169 | Ved Priya | HR | Chandigarh | 66 | M | Retired, Govt. Sen. Sec. School, Patikara Narnaul, Mohindergarh, Haryana |
| 170 | Veerpal Kaur | PB | Chandigarh | 27 | F | Govt. Sen. Sec. School, Kotala, District - Ludhiana |
| 171 | Vimal Mehta | PB | Chandigarh | 40 | M | SGTB Khalsa College, Sri Anandpur Sahib Punjab |
| 172 | Aktaria Khatun | WB | Guwahati | 31 | F | R. B. M. Govt. Girls' School, Jhargram, Jhargram 721507 |
| 173 | Alokananda Ghosh | WB | Guwahati | 55 | F | Kamrabad Girls' High School (HS), Kamrabad, Sonarpur, Rajpur Sonarpur, West Bengal 700150 |
| 174 | Aparajita Roy | WB | Guwahati | 23 | F | Govt. Sponsored Multipurpose School For Boys, Taki House, 299B, A P C Road Kolkata-700009 Kolkata-700009. |
| 175 | Devendra Charan Dwary | JH | Guwahati | 51 | M | SEDO Science Club, B.Deoghar-814112, Jharkhand |
| 176 | Dhruba Banerjee | WB | Guwahati | 37 | M | Swami Vivekananda Institute of Science and Technology, Dakshin Gobindapur, Pin-700145, 24 Parganas(S), West Bengal |
| 177 | Forchiba Kichu | NL | Guwahati | 28 | M | Phek Government College, Phek, Nagaland 797108 |
| 178 | Hage Doley | AR | Guwahati | 35 | M | Dera Natung Govt. College, Itanagar - 791113 |
| 179 | Jayanti Selvaraj | AR | Guwahati | 43 | F | Jawaharlal Nehru College,P.O. Hill Top,Dist. East Siang,Pasighat: 791 103 |
| 180 | Jintu Kumar Deka | AS | Guwahati | 46 | M | Ghanakanta Baruah College Dist-Morigaon,Assam Pin-782105 |
| 181 | Jyoti Prasad Gogoi | AS | Guwahati | 34 | M | Kaziranga University (KU) Koraikhowa, NH-37, Jorhat, Assam 785006 |
| 182 | Kabita Baruah | AS | Guwahati | 34 | F | Nalbari Polytechnic, Chandkuchi Dist:Nalbari, State: Assam Pin: 781335 |
| 183 | Konsam Santoshkumar | MN | Guwahati | 43 | M | C.C. Higher Sec. School, Santhong, Imphal East District. PIN-795001 |
| 184 | Lalremtluanga R. | MZ | Guwahati | 31 | M | Govt. Zemabawk Higher. Secondary School,Saitual, Aizwal |
| 185 | Laltlanzuala C | MZ | Guwahati | 29 | M | Mizoram Science, Technology & Innovation Council, Mizoram |
| | | | | | | |

| No. | Name of the Participant | State | Meeting Location | Age | M/F | Name & address of School / College of the participant |
|-----|--------------------------|-------|------------------|-----|-----|---|
| 186 | Latika Kalita | AS | Guwahati | 36 | F | Kamrup Polytechnic, Baihata Chariali, Dist: Kamrup, State: Assam, PIN: 781381 |
| 187 | Maisnam Premchand Singh | MN | Guwahati | 37 | M | T.G.. Higher Sec. School, Jail Road, Imphal West District. PIN-795001 |
| 188 | Mamani Kalita | AS | Guwahati | 35 | F | Lakhimpur Polytechnic, Bihpuria, Lakhimpur |
| 189 | Monzurul Kader Ahmed | AS | Guwahati | 41 | M | Golpara Polytechnic, Dist: Goalpara (Assam), PIN: 783121 |
| 190 | Moumita Dasgupta | WB | Guwahati | 32 | F | Techno India Group Public School, 5, North Nowdapara Road, Ariadaha, Kolkata 700056. |
| 191 | Nongmaithem Sanjiv Singh | MN | Guwahati | 30 | M | Langmeidong Higher Sec. School, Kakching District. |
| 192 | Padmeswar Senapati | AS | Guwahati | 41 | M | Nowgong College, Dist-Nagaon, Assam Pin-782001 |
| 193 | Palash Kumar Saha | WB | Guwahati | 43 | M | Sudhir Memorial Institute, Ganganagar, Doltala, Madhyamgram, Kolkata-700132 |
| 194 | Prabhakar Behera | OR | Guwahati | 41 | M | DAV Public School, Chandrasekharpur, Sailashree Vihar, Bhubaneswar, Odisha |
| 195 | Pradip Kr. Singha Deo | JH | Guwahati | 43 | M | Science & Mathematics Development Organization, Bidhu Bhushan Sarkar Road, B. Deoghar-814112, Jharkhand |
| 196 | Pranab Biswas | WB | Guwahati | 36 | M | Omdayal Group of Institutions, Uluberia Industrial Growth Centre Birshibpur Dist. Howrah 711 316 |
| 197 | Pranab Kalita | AS | Guwahati | 39 | M | Pandit Deendayal Upadhyaya Adarsha Mahavidyalaya (PDUAM), Dalgaon, Darrang, Assam-784116 |
| 198 | Pukhrambam Sarju Singh | MN | Guwahati | 27 | M | Kakching Higher Sec. School, Kakching District. |
| 199 | Rajkumar Nabakumar Singh | MN | Guwahati | 50 | M | Mangolganbi College, Ningthoukhong, Bishnupur District |
| 200 | Ranjit Kumar Kalita | AS | Guwahati | 48 | M | Morigaon College, Dist: Morigaon(Assam), PIN: 782105 |
| 201 | Rebecca Lalngaihawmi | MZ | Guwahati | 33 | F | Mizoram University, Aizawl, Mizoram |
| 202 | Rinku Das | WB | Guwahati | 36 | F | Garden Reach Nut Behari Das Girls' High School(Govt Sponsored), N-96 Paharpur Road, Kolkata-700024 |
| 203 | Rumi Chaharia | AS | Guwahati | 34 | F | Miles Bronson Residential School, Borjhar, Guwahati, Assam |
| 204 | Sanjana Khawas | NL | Guwahati | 28 | F | Mount Sinai Hr. Sec. School, Kohima, Nagaland |
| 205 | Sanjeeb Kalita | AS | Guwahati | 32 | M | Baksa Polytechnic, Belguri Pathar, Dist: Baksa, State: Assam, PIN: 781372 |
| 206 | Shib Ranjan Paul | WB | Guwahati | 49 | M | St. Xavier's School, Karnajora PO, Raiganj, U. Dinajpur Dist, WB- 733130. |
| 207 | Suraj Mohan Lal Das | JH | Guwahati | 51 | M | Omsatyam Science & Geography Development Organization, Ghorlas, Deoghar, Jharkhand |
| 208 | Syed Hamidul Islam | AS | Guwahati | 41 | M | Cotton Collegiate Govt. Higher Secondary School |
| 209 | Trishna Moni Das | AS | Guwahati | 27 | F | Nalbari Polytechnic, Chandkuchi Dist:Nalbari, State: Assam Pin: 781335 |

| No. | Name of the Participant | State | Meeting Location | Age | M/F | Name & address of School / College of the participant |
|-----|------------------------------|-------|------------------|-----|-----|---|
| 210 | Upasha Sarma | AS | Guwahati | 25 | F | The Assam Kaziranga University, Koraikhowa, NH 37, Jorhat 785006, Assam |
| 211 | Vivekananda Singh A | MN | Guwahati | 27 | M | Jiribam Higher Sec. School, Jiribamt District. PIN-795116 |
| 212 | Aesha B Pandya | GJ | Gandhinagar | 25 | F | shri B.K.K.P.S.M B.Sc College , Palanpur |
| 213 | Anal Kiritkumar Patel | GJ | Gandhinagar | 33 | F | Shri Sarvajani Science College, Mehsana |
| 214 | Anit B. Narang | GJ | Gandhinagar | 41 | M | Shree Narayana Higher Secondary School, Gurudev Nagar, Naroda, Ahmedabad-382345. |
| 215 | Anjali Sudam Mane | MH | Gandhinagar | 45 | F | Ramsethi Public School, Kharghar Sector 19, Plot 1, 11A, Navi Mumbai |
| 216 | Anu Sebasitan N. | GJ | Gandhinagar | 35 | F | St.Xavier's High School-Hansol-Ahmedabad |
| 217 | Arvind Purohit | RJ | Gandhinagar | 38 | M | PGT, physics, Shankar Vidya, Peeth, Mount Abu, Sirohi |
| 218 | Ashish Prasad K | GJ | Gandhinagar | 26 | M | Christ College, Vidhyaniketan PO near Saurashtra University Munjka Village Rajkot-5 |
| 219 | Bamania J. B. | DD | Gandhinagar | 32 | M | Govt. Higher Secondary School-Diu, PGT (physcs) |
| 220 | Bariya M. N. | DD | Gandhinagar | 49 | M | Govt. Higher Secondary School-Diu, PGT (Maths) |
| 221 | Bhim Bahadur | RJ | Gandhinagar | 46 | M | Mathematics, st. Anthony sr. sec.school, Udaipur |
| 222 | Chetan M Patel | GJ | Gandhinagar | 27 | M | Adarsh Science College, Palanpur |
| 223 | Devayaniben S Patel | GJ | Gandhinagar | 24 | F | Un Vibhag Kelavani Mandal Science College, Un 385560, Banaskantha |
| 224 | Dinesh Kumar Lodha | RJ | Gandhinagar | 35 | M | HOD, Mathematics, BSN Academy, KOTA |
| 225 | Dinesh V Suthar | GJ | Gandhinagar | 64 | M | Diwan Ballubhai Higher Secondary School, Kankaria, Ahmedabd |
| 226 | Foram M Joshi | GJ | Gandhinagar | 33 | F | G H Patel College of Engineering and Technology, Vallabh Vidyanagar |
| 227 | Gohil Hitendrasinh Kiritsinh | GJ | Gandhinagar | 37 | M | Kalapi Vinay Mandir, Near Bus Stand, Lathi, Amreli 365430 |
| 228 | Harsh Pandit | GJ | Gandhinagar | 34 | M | Shankersinh Vaghela Bapu Institute of Technology Vasan PO., Gandhinagar 382650 |
| 229 | Hitarthi Patel | GJ | Gandhinagar | 31 | F | Shri Maneklal M. Patel Institute of science and research |
| 230 | Ishan Johari | RJ | Gandhinagar | 29 | M | PGT Physics, Central Academy Shikshanter, Senior Secondary School, Kota-324001 |
| 231 | Karan Rathod | GJ | Gandhinagar | 30 | M | R. K. University, Bhavnagar Highway, Kasturbadham, Rajkot, Gujarat 360020 |
| 232 | Kinjalben Dashrathlal Patel | GJ | Gandhinagar | 31 | F | Shri Sarvajani Science College, Mehsana |
| 233 | Krunal Devangkumar Trivedi | GJ | Gandhinagar | 35 | M | Mount Carmel High School, Gandhinagar |
| 234 | Kushal Bhatt | GJ | Gandhinagar | 26 | M | Shri Maneklal M. Patel Institute of science and research |

| No. | Name of the Participant | State | Meeting Location | Age | M/F | Name & address of School / College of the participant |
|-----|--------------------------------|-------|------------------|-----|-----|--|
| 235 | Makwana R. J. | DD | Gandhinagar | 31 | M | Govt. Higher Secondary School-Diu, PGT (physics) |
| 236 | Mukesh Shrimali | RJ | Gandhinagar | 44 | M | The Study senior secondary school, udaipur |
| 237 | Panchal Loyeshkumar Ambalal | GJ | Gandhinagar | 42 | M | C V M H S E Complex (Sciene Stream) R P T P, Nr.Post Office,Mota Bazar, Vallabh Vidyanagar,388120 |
| 238 | Patel Chiragkumar Dasharathbai | GJ | Gandhinagar | 32 | M | R. S.P.M. Vividhlakhi S. V. High School, Kadi |
| 239 | Priyanka Satish Aradhye | MH | Gandhinagar | 53 | F | Nutan Prashala,Vijapur Road,Solapur.Dist.Solapur,Maharashtra. |
| 240 | Rakhi Trivedi | RJ | Gandhinagar | 42 | F | Lecturer, Maharana Mewar public school, Udaipur |
| 241 | Rami Jitesh Mukesh Bhai | GJ | Gandhinagar | 26 | M | Gokul Science College, Siddhpur Palnpur Highway, Siddhpur |
| 242 | Sanjay B. Bosamiya | GJ | Gandhinagar | 42 | M | PRK Vidhya Sankul,District Community Science Center- Surat, Vasudev Smart School no.4, Piplod Surat |
| 243 | Smita B Joshi | GJ | Gandhinagar | 49 | F | G H Patel College of Engineering and Technology, Near Bakrol Gate,Valabh Vidyanagar-388120, Dist Anand |
| 244 | Solanki Jayesh. D. | DD | Gandhinagar | 32 | M | Govt. Higher Secondary School-Diu, PGT (Maths) |
| 245 | Solanki Kalpesh. J. | DD | Gandhinagar | 32 | M | Govt. Higher Secondary School-Diu, PGT (Maths) |
| 246 | Sonam Navinchandra Brahmhatt | GJ | Gandhinagar | 27 | F | Shri Sarvajani Science College, Mehsana |
| 247 | Sumi Anil | GJ | Gandhinagar | 39 | F | Shree Narayana Higher Secondary School, Gurudev Nagar, Naroda, Ahmedabad-382345. |
| 248 | Vishwas S. Korde | MH | Gandhinagar | 67 | M | Mazagaon Dock Ltd,Dockyard Road, Mumbai, 400010,Maharashtra |
| 249 | Yogendra Chaturvedi | GJ | Gandhinagar | 39 | M | Aadharshila School Valad Gandhinagar |
| 250 | Zalak B Dalasaniya | GJ | Gandhinagar | 24 | F | Kendriya Vidhyalaya, junagadh |