



Workshop “Innovative Experiments in Physics” Venue:
Conference Hall HFRI, Panthagati, Shimla H.P. 15th -19th
May, 2018

Background:

H.P. Council for Science, Technology & Environment (HIMCOSTE), Shimla works for the popularisation of Sciences in the State. The workshop titled “Innovative Experiments in Physics” was successfully organised from 15th May - 19th May, 2018 at Himalayan Forest Research Institute (HFRI), Panthagati, Shimla for Science Graduate/ Post Graduate teachers from tribal regions & others district of H.P.

The five day workshop was a residential program organised by H.P Council for Science, Technology & Environment (HIMCOSTE), under Science Popularisation Program, in collaboration with Vigyan Prasar, Department of Science & Technology (DST), Govt. of India (GoI).

Inauguration of workshop:

The workshop was inaugurated by **Dr. Amar Dev**, Hon’ble Director, Higher Education in presence of **Sh. Kunal Satyarthi, Member Secretary, HIMCOSTE**.

Sh. Kunal Satyarthi, Member Secretary, HIMCOSTE, in his key note address was very much influenced by Artificial Intelligence Workshop, so he quoted that everything surrounding us is related Physics in one way or other. He emphasised that Physics is very vast and innovative subject. He also suggested teachers to be “Curious” throughout life and that they must inculcate the habit of reading. He suggested to read book “Curious” – The desire to know & why your future depends on it.

He also assured that HIMCOSTE would organise such workshops in future to all the students who are living in hard areas, so that they might not be deprived of Knowledge due to difficult geographical terrains or due to non availability of internet connectivity.

Sh. Kunal Satyarthi further appreciated the efforts of Vigyan Prasar, particularly of Dr. B.K. Tyagi for organising such informative & useful workshops during the last one year in different parts of Himachal Pradesh. He also appreciated Mr. Manish Yadav, the resource person for his energetic and unique teaching skills.

Dr. B.K Tyagi, Scientist ‘F’, VIGYAN PRASAR, DST, GoI in his key note address said that Vigyan Prasar and Department of Physics, Indian Institute of Technology, Kanpur, have jointly developed innovative open-ended experiments in Physics for school students and teachers This module is an attempt on the part of VIGYAN PRASAR to supplement formal science education through new approaches and methods using low cost or no cost material. The proposed five-day workshop is to develop Master Resource trainers as part of capacity building programme. Majority of the participants have been trained in previous workshops organised earlier in a

different district of Himachal Pradesh. Besides the feedback, the skill of the participants will be sharpened in communicating formal science to children outside the classroom situation.

Dr. Amar Dev, Director, Higher Education, Himachal Pradesh, in his Inaugural speech appreciated the contribution of TGT teachers in building the future of coming generation of our nation. He appreciated the efforts of “HIMCOSTE & VIGYAN PRASAR” towards organising workshop on “Innovative experiments in Physics”. He also emphasised to use technology in a positive & innovative way to teach students. Also stated that more responsibilities lies on the shoulder of TGT teachers to uplift the students.



Resource Persons:

The resource persons for the workshop were from Vigyan Prasar, DST, GoI, New Delhi, namely

- 1) **Dr. B.K Tyagi**, Scientist 'F';
- 2) **Mr. Manish Yadav**, Science Communicator;
- 3) **Sh. Darshan Lal Baweja**, Science communicator.

Participants:

Total number of participants who attended this workshop were 50, out of which 29 participants were from districts of Kinnaur, Chamba, Lahaul & Spiti and Kangra and 21 participants were from other districts of H.P.

Objectives:

The main objective of the workshop "Innovative Experiments in Physics" was to develop Master Resource Trainers. This was organised to train & empower especially tribal Science Teachers in Schools located in far flung inaccessible regions where there is no access to internet & mass media facility, for undertaking easy & simple experiments in the classroom so that students are able to understand the difficult concepts of Science. The objective was to teach Physics with fun and ease through new approaches & methods using low cost or no cost materials. The workshop was aimed at ensuring that the students from such region are not deprived of the knowledge related to the advancements taking place in the field of Science & Technology.

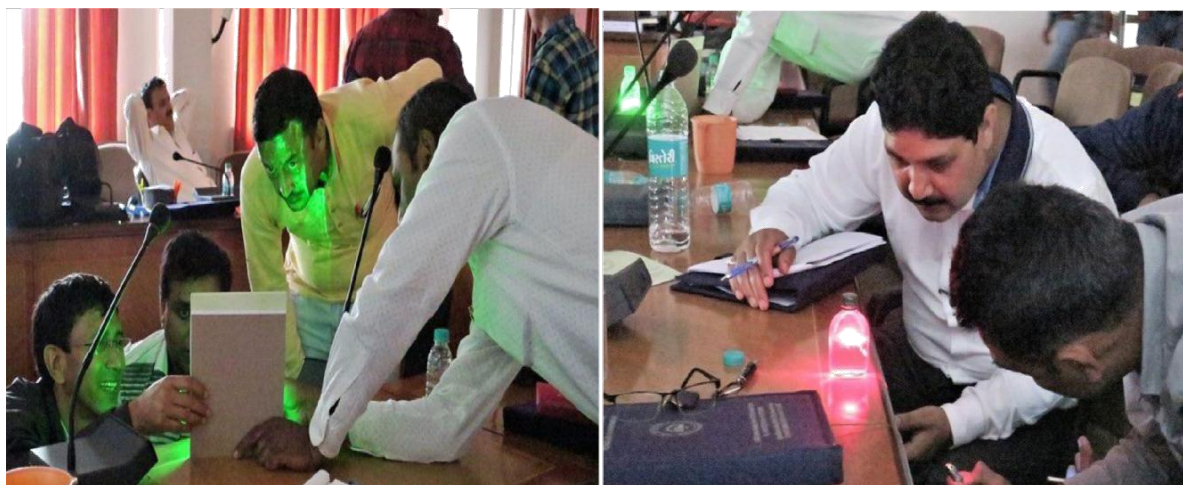
Day wise proceedings of the five day Workshop are given below:

Day 1 (15th May, 2018)

The workshop commenced with the ice breather session by Dr. B. K. Tyagi with a talk on the objectives of workshop and need of teaching 'Physics' in innovative way, using no cost and low cost materials. Subsequently all the participants were divided into seven groups. Afterwards Mr. Manish Yadav gave presentation, basically to expand our vision and to understand the basic thing that all questions should be welcome from the students and they should be encouraged to ask them. A pre test-1 was distributed to all participants and workbook-1 based on optics was also given to all the participants. The activities of workbook-1 were first explained by Mr. Manish Yadav and all activities were carried out by participants in groups. The observations were recorded by them along with their explanations. Workbook-1, based on optics was carrying very interesting activities. Topics like U-V relation of convex lens using candle as the source was one of simplest but effective activity to see where real and virtual images are formed. All the participants performed the activities like a curious student. The pre test-1 was also discussed at end of the session.



DEMONSTRATION OF U-V RELATION OF CONVEX LENS USING CANDLE SOURCE



ACTIVITIES BASED ON OPTICS

Day 2 (16th May, 2018)

The second day workshop started at 9.30 am with discussion session on workbook -1 with Mr. Manish Yadav. The participation of participants with lot of queries was remarkable. All the participants discussed the workbook-1 with convergent and divergent modes. Pre test-2 and workbook-2 were distributed to all participants. The workbook-2 was based on activities related to electrostatic and electromagnetic force. After discussion of the topics with Mr. Manish Yadav, all participants started doing the activities curiously. This day was different from the previous one in the sense that all participants were trying to find some different results, since they started thinking in divergent ways, trying to do something innovative. The very second day of workshop started achieving the objective of the workshop. The workshop continued till 8.00 pm. Pre test-2 and workbook-2 was discussed at the end of second day session.



DEMONSTRATION OF ELECTROSTATIC FORCE

Day 3 (17th May, 2018)

The third day workshop began with the talk by Dr. B. K Tyagi and wonderful activities were performed by resource person Mr. Darshan Lal Baweja based on laws and principles of Physics. These activities helped to understand laws, concepts and principles of Physics and were performed by using very simple and locally available, no cost or low cost materials. The special feature of this session was that it covered very simple activities, different from the given examples in books to explain physics laws and principles of Physics. The most interesting one was, using a knitting needle, potato and hammer, to explain Newton's third law (Action-Reaction) instead of giving bookish example of swimming. After this innovative demonstration, the workbook-3 based on Mechanics was distributed to all participants who were eagerly waiting for it. This third day session was more interesting than the previous one as now in the discussion session with Mr. Manish Yadav, participants started raising their doubts and ideas. This session was interactive, two way-process, exactly what a learning should be. All participants actively performed activities and discussed all the results with the resource person. This session went long as flood of questions and answers came as it was all about pressure and force. So a very interesting topic was discussed in a very interesting way. Pre test-3 given at the beginning of the session was also discussed at end of the session.



DEMONSTRATION BY SH. DARSHAN LAL BAWEJA



Day 4 (18th May, 2018)

The forth day session started at 9.30 a.m. with a motivational talk by Mr. Bachan which was followed by performing various activities by Dr. Darshan Lal Bawega based on Physics laws and theories. All teachers were behaving like a curious child by touching things and doing activities themselves. This session went long and Mr. Manish Yadav conducted a “Query Session”. This session was conducted on request from the participants. Lots and lots of queries with lot of discussions showed that students are now going to learn things in new and easy to understand fashion.



INTERACTIVE SESSION DURING WORKSHOP

Day 5 (19th May, 2018)

The last and final day of workshop started with talk by Mr. Manish Yadav and then a national award winning documentary film was played which showed how children themselves have done a simple activity of blowing paper in air like a parachute. The closing session was chaired by Chief Guest **Dr. Manmohan Sharma, Director Elementary Education**. The feedback was taken from participants and their efforts were awarded by giving them participation certificates and science kits. The concluding day of the workshop ended with a conclusion that such workshops on every subject should be organised by HIMCOSTE.

Closing ceremony:

The closing ceremony of the workshop was chaired by **Dr. Manmohan Sharma, Hon'ble Director, Elementary Education**. Participation Certificates were distributed to all participants. The complete workshop was very well organised by complete organising committee from HIMCOSTE under the able guidance & support of Member Secretary, HIMCOSTE.

Dr. Manmohan Sharma, Director, Elementary Education, in his speech appreciated the efforts of the workshop organised by HIMCOSTE, on basis of feedback of participants. He also very politely listened all the problems of the participants and assured to solve them to make future of nation brighter. He said, teacher is the only weapon who can revolutionise the education system with peace.



CLOSING CEREMONY



CERTIFICATES AND SCIENCE KIT DISTRIBUTION



Summary:

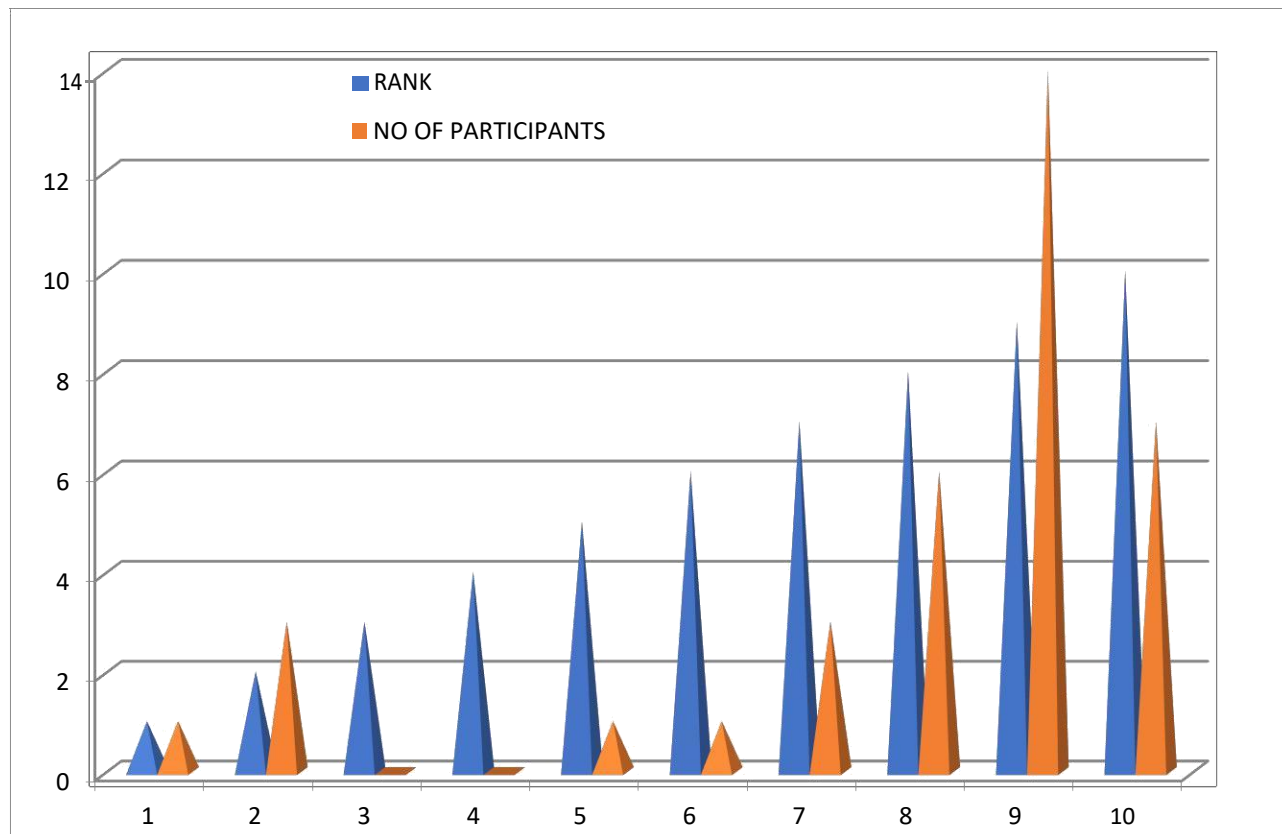
The feedback received from the Resource persons & Participants was very encouraging, proving that the objective of the workshop was achieved successfully. It can be summarised that such workshop are really very beneficial in achieving the objectives set under “Science Popularisation Programme of HIMCOSTE” for making students from the Schools across the state of H.P, more creative and innovative despite all limitations and hurdles.

15 से 19 मई तक कार्यशाला

शिमला, 11 मई (ब्यूरो): प्रदेश विज्ञान, प्रौद्योगिकी और पर्यावरण (हिमकोस्ट) भौतिकी में अभिनव प्रयोग पर 15 से 19 मई तक कार्यशाला आयोजित करने जा रहा है। इस कार्यशाला का उद्घाटन मनीषा नंदा, अध्यक्ष हिमकोस्ट-कम-अतिरिक्त मुख्य सचिव (पर्यावरण, विज्ञान और प्रौद्योगिकी) द्वारा किया जाएगा। इसमें डॉ. बी.के. त्यागी, वैज्ञानिक, मनीष यादव विज्ञान संचारक, विज्ञान प्रसार, डी.एस.टी., भारत सरकार कार्यशाला के लिए मुख्य संसाधन व्यक्ति होंगे। कुणाल सत्यार्थी आई.एफ.एस., सदस्य सचिव हिमकोस्ट, कार्यशाला के दौरान उपस्थित रहेंगे।

Feedback

Graph Representing the Rankings of the Workshop



Reflections by Participants:

The 5 day Workshop helps to understand the basic principles of Lesson Planning:-

- i. It is valuable to know the aims & objectives of the subject. It helps for the planning of Lesson.
- ii. Demonstration by the Resource person was effective.
- iii. Workshop cleared the basic phenomenon of Physics.
- iv. Workshop should be of more than 5 days (1 week).
- v. Such workshops should be organised especially concerning lower classes.
- vi. Workshops should be organised at district level.
- vii. Workshops should be organised for other subjects also like Mathematics, Chemistry and Biology.

Annexure – A

List of participants

S. No.	Name	Address (School)	Address (Residence)	Mobile/Phone Number	E-mail	District
1.	Sh. Manoj Mahajan	Lecture Physics, GSSS Kothipura, Distt. Bilaspur, HP174001	VPO Kandroul Tehsil Sadar, Distt. Bilaspur, HP 174004	94180-50785 70185-20791 9816550785 (W)	prabhukripa.mahajan@gmail.com	Bilaspur
2.	Sh. Madan Lal	Lecture Physics, GSSS Berthin, Distt. Bilaspur, HP 174029	Vill. Mihara, P.O. Marhana, Tehsil Chumarwin, Distt. Bilaspur, HP 174028	94184-72008 7018441008	cantanphy@gmail.com	Bilaspur
3.	Sh. Surinder Dhiman	TGT (NM) GSSS Lakhnoo Distt. Bilaspur, HP 174015	VPO Lakhnoo via Behal Tehsil Shri Naina Devi Ji Distt. Bilaspur HP 174015	94181-48194 70186-72194	surinderdhiman940@gmail.com	Bilaspur
4.	Sh. Shiv Kumar Negi	TGT (M) GMSSS Kalpa		9805629391 8219596977	kozangneg964@gmail.com	Kinnaur
5.	Sh. Anil Negi	TGT (M) GSSS Kothi		9816952290	negianil627@gmail.com	Kinnaur
6.	Sh. Ankush Negi	TGT M GHS Yulla		9418589896		Kinnaur
7.	Sh. Virender Negi	TGT NM GMS Chini Gaon		9418327987	virenderbhandari197@gmail.com	Kinnaur
8.	Sh. Zalamber Singh	Lect Physics DIET Reckong-Peo		9418862433 8627079433 (W)	zalambarsinghnegi@gmail.com	Kinnaur
9.	Sh. Rakesh Bhardwaj	TGT NM GMS Powari		9459667557	bhardwajrakesh9@gmail.com	Kinnaur
10.	Sh. Ramesh Lal	Lect. Physics GSSS Jaunaji	Flat No. B-I Amit Avenue Dhobighat Road, Solan	01792-246037 9418169116	ramesh.jawani@gmail.com	Solan
11.	Sh. Shyam Lal	PGT Physics GSSS Mamligh	Vill. & P.O. Mamligh, Teh. Kandaghat Distt. Solan173222	9817385512 01792-289612	primamligh@rediffmail.com shyamlalbagi@yahoo.co.in	Solan
12.	Sh. Vijay Kumar	TGT (NM) GMS Kumarhati, u/c GSSS Nalagarh (G)	Vill. Nalka P.O. Manpura Teh. Baddi District Solan 174101	9817031892	prasharvk2004@gmail.com	Solan
13.	Sh. Sanjeev Kumar	TGT Science GHS Bandla, Distt. Chamba (HP) 176311	Vill. Lakra, P.O. Bandla Tesh, And, Distt. Chamba HP 176311	9805447201	sanjeevjariyal1978@gmail.com	Chamba

14.	Sh. Bhupender Singh	TGT Science GSSS Poolan V & PO Sirdi, Chamba, HP	V & PO Sarol, The. & District Chamba, HP	9816431857	braghuvanshi14@gmail.com	Chamba
		Teh. Bharmour, Distt. Chamba, HP 176315	176318			
15.	Sh. Gagan Kumar	TGT Science GMS Belly, U/c GHS Rajera, PO Rajera, Teh. Chamba, District Chamba, HP 176318	V & PO Sarol, Teh. & Distt. Chamba (HP) 176318	8894502015 9418655287 (W)	gagankmr33@gmail.com	Chamba
16.	Sh. Anil Kumar	TGT Science GMS Swai U/c GSSS Garola, Teh. Bharmour, Distt. Chamba (HP) 176309	S/o Sh. Rattan Chand V & PO Garola The. Bharmour, District Chamba (HP) 176309	9816594255	anilnmol1627@gmail.com	Chamba
17.	Sh. Deepak Kumar	TGT Science GHS Sapahan Vill. Banjwad PO Wangal Teh. Salooni, Distt. Chamba, HP-176308	S/o Sh. Chhabo Ram, Vill. Banjwad, PO Wangal, Teh. Salooni, Distt. Chamba HP 176308	9418497953	deepakraghuvanshi00986@gmail.com	Chamba
18.	Sh. Vinod Kumar	TGT Science GHS Dhanie PO Saru, Teh. & Distt. Chamba, HP 176310	Village Chhudra PO Matti, Tehsil & Distt. Chamba HP 176308	9418086995	1976vinodsharma@gmail.com	Chamba
19.	Sh. Ajay Kumar	TGT Science GMS Urei U/C GSSS Ranuhkothi	Vill. Manchhar, PO Tangnarwana Tehsil Dharamshala, Distt. Kangra HP	9816968938	ajjumachhan@gmail.com	Chamba
20.	Sh. Vinod Kumar	TGT Science GSSS Ullansa, PO Ullansa, Tehsil Bharmour, Distt. Chamba HP 176309	Vill. Garan, PO Gurial, Tehsil Nurpur, Distt. Kangra, HP 176051	9418448902	vinodbenoor84@gmail.com	Chamba
21.	Sh. Maninder Kumar	GSSS Chanhouta, V&PO Chanhouta, Tehsil Bharmour, Distt. Chamba, HP 176309	V & PO Pukhri, Tehsil and Distt. Chamba HP 176319	8894557982	mani4silp@yahoo.com	Chamba
22.	Ms. Manuj Gupta	Lect. Maths GSSS Phagli		9418209443	manujshimla@gmail.com	Shimla
23.	Mr. Rajesh Mokta	TGT- NM GGSSS Lakkar Bazzar		9418456265	rajeshmokta@gmail.com	Shimla
24.	Dr. Prashant Sharma	Lecturer (Physics) GBSSS Lalpani		9418088402	prashantshrm5@gmail.com	Shimla
25.	Sh. Kuldeep Sharma	TGT Science GSSS Sultanpur		8219044752 9418091455	kuldeepsharma5873@gmail.com	Kullu

26.	Sh. Vivek	TGT Science GHS Chansari		9817258585	vc_sml@yahoo.co.in	Kullu
27.	Sh. Lal Singh Chauhan	PGT Physics GSSS Manali		7018294700 8894881400	lschauhan444@gmail.com	Kullu
28.	Sh. Mahesh	TGT GSSS Kashimbeidha		9459043592	mahesh.gumna.mg@gmail.com	Mandi
29.	Sh. Rakesh Bansal	Lect. Physics GSSS Paonta Sahib, district Sirmour	C/o Chawla Enterprices, The Mall Nahan	9816239241	dr17sam@gmail.com	Sirmour
30.	Sh. Dinesh Kumar	PGT Physics GSSS Kaffota	Vill. Kaffota, P.O. Dugana	9418133111 9817233111	dineshtomar33111@gmail.com	Sirmour
31.	Sh. Anil Kumar Nagwal	Lect. Physics GMSSS Sataun, Distt. Sirmour, HP 173029	Vill. Thana, P.O. buffarin, Tehsil & Distt. Hamirpur HP 177029	9418172966	anilknagwal@gmail.com	Sirmour
32.	Sh. Surjeet Singh	Lect. Physics GSSS Dada Siba		9418161645	bubysingh72@gmail.com	Kangra
33.	Sh. Anil Kumar Azad	Lect. Physics GSSS Lahla Charri		9418463524	azadanilkumar@gmail.com	Kangra
34.	Sh. Shashi Kumar	TGT-NM GSSS Dola Kharyana		8894602703	shashichandro@gmail.com	Kangra
35.	Sh. Shashi Kant	TGT-NM GMS Balardu U/c GSSS Sehorpain		9418832731	meet2shashi@gmail.com	Kangra
36.	Sh. Ashu Dhiman	TGT- NM GBSSS Dharamshala		9418090055	ashu646@gmail.com	Kangra
37.	Sh. Ravinder Sharma	Lect. Physics GSSS Jawalamukhi		9418003372	ravindera1999@gmail.com	Kangra
38.	Sh. Sushil Kumar	PGT Physics GSSS Suliali		9418121162	sushilfuturefoundation@gmail.com	Kangra
39.	Sh. Arun Bakshi	Lect. Physics GSSS Gharana		9418495126	bakshi126@rediffmail.com	Kangra
40.	Sh. Milant Dogra	TGT-NM GHS Saddun		9418045700	milantdogra@gmail.com	Kangra
41.	Sh. Vinod Kumar	Lect. Physics GSSS Sujanpur		9418458087	vinodshrm973@gmail.com	Hamirpur
42.	Sh. Raj Kumar	TGT-NM GSSS Badhani		9418258783	gsssbadhani@rediffmail.com	Hamirpur
43.	Sh. Chander Kant	TGT NM GHS Baloh		9418466162	im27sthakur@gmail.com	Hamirpur
44.	Sh. Suresh	TGT (NM) GSSS Shakoli		9459015104		Lahaul & Spiti
45.	Sh. Anish	TGT (NM) GMS Yurnath		9459993555	anishtgt1@gmail.com	Lahaul & Spiti
46.	Sh. Surinder Thakur	TGT (M) GSSS Gwndhla		9418774555		Lahaul & Spiti

47.	Sh. Sandeep Kumar	TGT (M) GSSS Sicsu		9418844193	sandeaskh12@gmail.com	Lahaul & Spiti
48.	Sh. Sudershan	TGT (NM) GSSS Malang		9418203593	sudershanmalpa@gmail.com	Lahaul & Spiti
49.	Sh. Mukesh Kumar	TGT/ (NM)		9418701249	mksharmahmr@gmail.com	Hamirpur
50.	Sh. Karun Singh	TGT (NM)		9418018130	karunrana431977@gmail.com	Hamirpur

