CURRICULUM VITAE

Personal Details:

Name : Dr. Manojit De

Father's Name : Mr. Alok Kumar De Mother's Name : Mrs. Subhadra De

Sex : Male

D o B : September 6th, 1989

Nationality : Indian
Marital Status : Unmarried

Language known : English, Hindi, Bengali



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VIDWAN profile: https://vidwan.inflinet.ac.in//profile/126449 (ID: 126449)

Skype ID: live:.cid.a8a1f99b406cafe4

A) Educational Qualification:

Class	Board/University	Year of Passing	Percentage	Division
$10^{ m th}$	W.B.B.S.E	2005	83.87	$1^{ m st}$
10+2 th	W.B.C.H.S.E	2007	73.40	1 st
B.Sc.(Annual System)	The University of Burdwan	2011	54.37	$2^{ m nd}$
M.Sc.(Physics) Semester System	Guru Ghasidas Vishwavidyalaya	2013	69.83	1 st
Pre-Ph.D. Course Work	Guru Ghasidas Vishwavidyalaya	2014 (Date of Registration: 14.12.2014)	73.00	$1^{ m st}$
Ph.D.	Guru Ghasidas Vishwavidyalaya	2019 (Date of final viva: 15.11.2019)		Degree Awarded

B) Ph. D. details:

Thesis title: Synthesis, Structural and Dielectric Characterization of Bismuth

Ferrite Based Solid Solutions

Supervisor: Dr. H. S. Tewari, Associate Professor, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G.

- C) Research Interest: Experimental materials science, Ferroelectric materials, Perovskite materials, Lead-free piezoelectric materials, Spinel based Magnetic materials system, Multiferroic materials system, Energy Storage, and energy harvesting materials, Nano-composites basically for an environmental application like wastewater treatment, Gas sensors, etc. Nanomaterials for biological applications and drug delivery.
- **D)** Technical Experience: I have good experience with the following techniques.
 - i. Well Known Characterization Techniques: X-ray Diffraction (XRD), Scanning Electron Microscopy (SEM), Fourier Transform Infrared Spectroscopy (FTIR), Micro-Raman Spectroscopy, LCR meter, Ferroelectric loop tracer.
 - ii. *Materials Synthesis / Thin Film Growth Techniques:* Solid-state ceramic method, Combustion method, Sol-Gel method, Spin Coating Technique.

E) Teaching/Academic Experience:

- i. Besides my research work, I was fully involved in teaching activities in our department at GGU. I generally took the practical classes of B.Sc. and M.Sc. students during the semester. I have also helped the M.Sc. /M. Tech. final semester students during their project work. I was also involved in academic works like unit tests, semester exams, university entrance exam (VET), counseling of students during their admission process. [During whole research period]
- ii. Started working as an Assistant Professor (Ad-hoc) at the Department of Physics in Lakshmi Chand Institute of Technology (LCIT Groups of Institutions), affiliated Atal Bihari Vajpayee Vishwavidyalaya, Bilaspur, C.G. [From 13.08.2018 to 28.02.2019] Job objective: Teaching of B.Sc. students
- iii. Started working as an Assistant Professor at the Department of Applied Physics (engineering) in Chouksey Engineering College (Chouksey Group of Colleges, affiliated Chhattisgarh Swami Vivekanand Technical University, Bhilai), Bilaspur, C.G. [From 25.07.2019 to till date]

 Job objective: Teaching of B. Tech. students; research and development.
- iv. Co-convener of international webinar series "Recent Trends in Material Science (RTMS-2020)"; Organized by Department of Applied Physics, Chouksey Engineering College, Bilaspur, in association with Indian Association of Physics Teachers (RC-10); July 13-14 2020.

F) Academic Responsibilities:

- i. Class in charge of B.Sc. third-year students; LCIT College of Commerce and Science, Bilaspur, C.G.
- ii. Coordinator for a one-day excursion for B.Sc. 2nd and 3rd-year students to the Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya (A Central University); LCIT College of Commerce and Science, Bilaspur, C.G.
- iii. Class in charge of different branches (1st & 2nd Semester); Chouksey Engineering College, Bilaspur, C.G.
- iv. Member of Research and Development Cell; Chouksey Engineering College, Bilaspur, C.G.
- v. Teacher-in-charge of 'Smart Club' in Chouksey Group of Colleges

G) List of Publications:

In refereed journals

1. Studies on Electrical Behavior of Multiferroic Based Double Doped Bismuth Ferrite System.

H. S. Tewari, Aarti Mishra, and Manojit De.

Adv. Sci. Lett., Vol. 21, Number 9, 2807-2810, (2015)

DOI: 10.1166/asl.2015.6391.

2. Characterization of Cadmium substituted Nickel Ferrites nano-particles synthesized using combustion technique.

Manojit De, Aniruddha Mukherjee and Hari S. Tewari.

Processing and Application of Ceramics 9 [4], 193–197, (2015)

DOI: 10.2298/PAC1504193D.

3. Strain induced structural phase transition in NaNbO₃ doped BiFeO₃

Manojit De, Shiv P. Patel, and H. S. Tewari

J Mater Sci: Mater Electron, 28: 6928–6935, (2017)

DOI: 10.1007/s10854-017-6393-9.

4. Synthesis and structural characterization of A-site doped NiFe₂O₄

Manojit De, Ananya Rout, and H. S. Tewari

AIP Conference Proceedings, 1837, 040042 (2017)

DOI: 10.1063/1.4982126.

5. $R_{0.5}Bi_{0.5}TiO_3$ (R = Na and K): Synthesis, structural and polarization study

Rashmi Tiwari, **Manojit De**, and H. S. Tewari

AIP Conference Proceedings, 1837, 040046 (2017)

DOI: 10.1063/1.4982130

6. Structural Characterization of Magnesium Substituted Nickel Ferrites NiFe_(2-x)Mg_xO₄ Nano-particles Synthesized Using Combustion Technique.

Manojit De, Soumen Bera and H. S. Tewari.

Emerging Materials Research, Volume 6, Issue 2, 265-269, (2017)

DOI: 10.1680/jemmr.15.00070

7. A Comparative Study on Structural Characterization of Mg Substituted on A/B sites in NiFe₂O₄ Nano-particles Using Auto-Combustion Method.

Manojit De and H. S. Tewari

Pramana – J. Phys. 89:3, (2017)

DOI: 10.1007/s12043-017-1394-z.

8. Synthesis and structural characterization of NaNbO₃ doped BiFeO₃ multiferroics **Manojit De** and H. S. Tewari

Ferroelectrics, 519:1, 43-48, (2017)

DOI: 10.1080/00150193.2017.1362284.

9. Structural and electrical characteristics of Barium modified Bismuth-Sodium Titanate $(Bi_{0.49}Na_{0.49}Ba_{0.02})TiO_3$

Sugato Hajra, Sushrisangita Sahoo, **Manojit De**, Pravat Kumar Rout, H. S. Tewari, R. N. P. Choudhary

J Mater Sci: Mater Electron, 29:1463–1472, (2018)

DOI: 10.1007/s10854-017-8054-4.

10. Resistive, Capacitive and Conducting properties of Bi_{0.50}Na_{0.50}TiO₃- BaTiO₃ solid solution

Sushrisangita Sahoo, Sugato Hajra, Manojit De, R N P Choudhary

Ceramics International, 44, 5, 4719–4726, (2018)

DOI: 10.1016/j.ceramint.2017.12.054.

11. Studies of structural, dielectric and electrical characteristics of BaTiO₃-BiFeO₃-CaSnO₃ electronic system

Sugato Hajra, Sushrisangita Sahoo, Twinkle Mishra, **Manojit De**, P. K. Rout, R. N. P. Choudhary

Journal of Materials Science: Materials in Electronics, 29, 9, 7876–7884, (2018) **DOI**: 10.1007/s10854-018-8787-8.

12. Structural, dielectric and electrical characteristics of BiFeO₃-NaNbO₃ solid solutions

Manojit De, Sugato Hajra, Rashmi Tiwari, Sushrisangita Sahoo, R.N.P. Choudhary, H.S. Tewari

Ceramics International, 44, 10, 11792-11797, (2018)

DOI: 10.1016/j.ceramint.2018.03.263.

13. Processing, dielectric and impedance spectroscopy of lead free BaTiO₃-BiFeO₃-CaSnO₃

Sushrisangita Sahoo, Sugato Hajra, **Manojit De**, Kalyani Mohanta, R. N. P. Choudhary

Journal of Alloys and Compounds, 766, 25-32, (2018)

DOI: 10.1016/j.jallcom.2018.06.284.

14. Investigation of resistive, capacitive and conductive properties of lead-free electronic material: 0.7Bi(Fe_{0.98}Ga_{0.02})O₃-0.30BaTiO₃

Romit Panigrahi, Sugato Hajra, **Manojit De**, Ajeet Kumar, A.R. Jems, R.N.P Choudhary

Solid State Sciences, 92, 6-12, (2019)

DOI: 10.1016/j.solidstatesciences.2019.04.002

15. Structural, electrical and ferroelectric properties of lithium niobate-bismuth ferrite solid solutions

Manojit De, Sugato Hajra, Rashmi Tiwari, Sushrisangita Sahoo, R.N.P. Choudhary, H.S. Tewari

Solid State Sciences, 93, 1-6, (2019)

DOI: 10.1016/j.solidstatesciences.2019.04.009

16. Studies on composition dependent structural and magnetic characterization of nanocrystalline cadmium doped nickel ferrite

Rashmi Tiwari, Manojit De, H. S. Tewari

AIP Conference Proceedings 2115, 030102 (2019)

DOI: https://doi.org/10.1063/1.5112941

17. Structural and magnetic properties of tailored NiFe₂O₄ nanostructures synthesized using auto-combustion method

Rashmi Tiwari, Manojit De, H. S. Tewari, S. K. Ghoshal

Results in Physics, 16, 102916 (2020)

DOI: https://doi.org/10.1016/j.rinp.2019.102916

18. BaTiO₃ and Ba_{0.9}R_{0.1}TiO₃ (R = Ni, Fe): low temperature synthesis, structural and phonon mode study

Manojit De, Soumitra Pal, Rashmi Tiwari, H. S. Tewari

AIP Conference Proceedings 2265, 030006 (2020)

DOI: https://doi.org/10.1063/5.0016648

19. Structural, morphological and vibrational studies of modified nickel ferrites Rashmi Tiwari, **Manojit De**, and H. S. Tewari

AIP Conference Proceedings 2265, 030088 (2020)

DOI: https://doi.org/10.1063/5.0016699

20. Structural and Dielectric Characterization of LiNbO₃ Substituted BiFeO₃

Manojit De, H. S. Tewari, and R. N. P. Choudhary

Proceedings of the 65th DAE Solid State Physics Symposium, 55, 817-818 (2022) ISBN No: 81-8372-085-4

In Book Chapter:

1. Chapter title: Lead-Free Perovskite Nanocomposites: An Aspect for

Environmental Application

Book title: Perovskite and Piezoelectric Materials, ISBN 978-1-78985-665-1

Author: Manoiit De

Publishers: IntechOpen, London, UK

Year of Publishing: 2020

DOI: http://dx.doi.org/10.5772/intechopen.93052

2. Chapter title: Theoretical calculations based results for plant extract as green Corrosion inhibitors

Book Title: Computational Modelling and Simulations for Designing of Corrosion

Inhibitors (Fundamentals and Applications)
Authors: Vinita Tamrakar, Manojit De
Publishers: Elsevier (Sciencedirect)

Year of Publishing: 2022 Status: Under review

H) Conferences, Seminars & Workshops attended:

i. Characterization of nickel substituted bismuth ferrites (Bi_{1-x}Ni_xFe_{1-y}Ni_yO₃; x=y=0.0 &/or 0.05) nano-particles synthesized using combustion technique

Manojit De, Rupam Kumar Pal and H. S. Tewari

DAE-BRNS National Conference on Current Trends in Advanced Materials (CTMat-2014), November 19-21, 2014

Variable Energy Cyclotron Center, Kolkata, W.B. (Poster presentation).

ii. Characterization of Magnesium Substituted Nickel Ferrites Nano-Particles Synthesized Using Combustion Technique

Manojit De, Ganesh Bera, and H. S. Tewari

National Conference on Environmental Radiation and Functional Materials (NCERFM-2015), February 28-March 01, 2015.

Department of Physics, Osmania University, Hyderabad, Telangana State. (Poster presentation).

iii. Structural characterization of magnesium and cadmium substituted nickel ferrites nanoparticles synthesized using combustion technique

Manojit De, Ganesh Bera, Aniruddha Mukherjee and H. S. Tewari

One-day national seminar on Advanced Synthesis and Characterization of Materials for Technological Application (ASCMTA-2015), March 30, 2015. Department of Pure and Applied Physics, GGV, Bilaspur-495009 (C.G.). (Poster presentation).

iv. Structural characterization of magnesium substituted nickel ferrites $NiMg_xFe_{(2-x)}O_4$ nanoparticles synthesized using combustion technique

Manojit De, Soumen Bera and H S Tewari

International Conference on Multifunctional Materials for Future Applications (ICMFA-2015), October 27-29, 2015

Department of Chemistry, IIT-BHU, Varanasi. (Poster presentation).

v. Synthesis and Structural Characterization of Vanadium doped Sodium Niobate [Na (Nb_{1-x}V_x) O₃, x = 0.30]

Manojit De, Babai Patra and H. S. Tewari

National Seminar on Energy Harvesting Materials and Techniques for Sustainable Development (URJA-2015); 2-3 Dec 2015

Department of Physics; Govt. V. Y. T. PG. Autonomous College, Durg, C.G. (Oral presentation).

vi. Synthesis and structural characterization of NaNbO₃ doped BiFeO₃ multiferroics Manojit De and H. S. Tewari

14th Chhattisgarh Young Scientist Congress-2016.

Organized by Chhattisgarh Council of Science and Technology and Bilaspur University on 28-29th February 2016. (**Oral presentation**).

vii. Two days workshop on "Intellectual Property Rights, IP Commercialization and Prevention of Plagiarism"

Guru Ghasidas Vishwavidyalaya, 26-27 Feb., 2016.

Jointly organized by Chhattisgarh Council of Science and Technology (CGCOST) and Guru Ghasidas Vishwavidyalaya.

viii. Synthesis and strain-induced structural modification of NaNbO₃ doped BiFeO₃ multiferroics

Manojit De and H. S. Tewari

International Conference on Technologically Advanced Materials and Asian Meeting on Ferroelectricity (ICTAM-AFM-10); 7-11 November 2016. Department of Physics, University of Delhi, New Delhi. (Poster Presentation)

ix. Synthesis and structural characterization of A-site doped NiFe₂O₄

Manojit De, Ananya Rout and H. S. Tewari

International Conference on Functional Oxides and Nano-materials (ICFONM-2016); 11-13, November 2016.

Department of Nanoscience and Advanced Materials, Saurashtra University, Rajkot, Gujrat. (Poster Presentation)

- x. Skill Development Training on "Materials Characterization Techniques"
 Jointly organized by School of Physical Sciences and Skill Development Cell;
 Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)
 February 16-17, 2017.
- xi. Synthesis and Strain induce structural characterization of NaNbO₃ modified BiFeO₃ multiferroics

Manojit De and H. S. Tewari

20th International Conference of International Academy of Physical Sciences (CONIAPS-XX): Recent Advances in Physical Sciences and Future Challenges; 14-16 July 2017

Faculty of Science (Departments of Mathematics, Physics & Chemistry), University College of Science, Osmania University, Hyderabad-500007, Telangana State, India. (Oral Presentation)

xii. Synthesis and structural characterization of A-site Ba-doped BiFeO₃

Manojit De, Pinki Kumari, Rashmi Tiwari, Gurupada Maity, Shiv P Patel, and H. S. Tewari

International Conference on Nanotechnology: Ideas, Innovations and Initiatives-2017 (ICN:3I-2017); 06-08 December 2017

Department of Mechanical and Industrial Engineering & Centre for Nanotechnology, Indian Institute of Technology Roorkee, Roorkee 247667, Uttarakhand, India. (Oral Presentation)

xiii. Nano-structured spinel ferrites: Synthesis and Characterization

Manojit De, Rashmi Tiwari, S. Suganya and H. S. Tewari

3rd International Conference on Recent Advancements in Chemical, Environmental & Energy Engineering; 15-16 February 2018

SSN College of Engineering, Chennai, Tamilnadu, India. (Oral Presentation) (Received Best Paper Award)

- xiv. Eco-friendly biocatalyst immobilized onto activated carbon obtained from agricultural waste
 - S. Suganya, P. Senthil Kumar and Manoiit De
 - 3rd International Conference on Recent Advancements in Chemical, Environmental & Energy Engineering; 15-16 February 2018
 - SSN College of Engineering, Chennai, Tamilnadu, India. (Poster Presentation)
- xv. Studies on Structural, Vibrational and Dielectric characterization of NaNbO₃ modified BiFeO₃

Manojit De and H. S. Tewari

16th Chhattisgarh Young Scientist Congress-2018.

Organized by Chhattisgarh Council of Science and Technology and Durg University on 27-28th February 2018. (**Oral presentation**).

xvi. Low-Temperature Synthesis and Structural Characterization of $BaTiO_3$ and $Ba_{0.9}R_{0.1}TiO_3$ (R = Ni, Fe)

Manojit De, Soumitra Pal, Rashmi Tiwari, S. Suganya and H. S. Tewari DAE-BRNS 7th Interdisciplinary Symposium on Materials Chemistry (ISMC-2018), BARC, Mumbai, 4-8th December, (2018). (Poster presentation)

xvii. Synthesis, Structural, dielectric and electrical characteristics of BiFeO₃-NaNbO₃ solid solutions: A case study for Bi_{0.8}Na_{0.2}Fe_{0.8}Nb_{0.2}O₃

Manojit De, Sugato Hajra, Rashmi Tiwari, Sushrisangita Sahoo, R.N.P. Choudhary, H.S. Tewari

XX National Seminar on Ferroelectrics and Dielectrics (XX NSFD-2018), 14-16th December 2018. (Oral presentation)

- xviii. Structural, Morphological and Vibrational Studies of modified Nickel Ferrites Rashmi Tiwari, **Manojit De**, H. S. Tewari 5th International Conference on Nanoscience and Nano-technology (ICONN-2019), Department of Physics and Nano-technology, SRM-IST, Chennai, 28-30th January 2019. (**Poster presentation**)
 - xix. BaTiO₃ and Ba_{0.9}R_{0.1}TiO₃ (R = Ni, Fe): Low-temperature synthesis, structural and phonon mode study

Manojit De, Soumitra Pal, Rashmi Tiwari, and H. S. Tewari 64th DAE-Solid State Physics Symposium, Indian Institute of Technology

xx. Studies of LiNbO₃ modified BiFeO₃: Structural, Vibrational, Dielectric, Impedance, and Polarization Study

Manojit De, H.S. Tewari, R.N.P. Choudhary

Jodhpur, 18-22nd December, (2019). (Poster presentation)

National Seminar on Advanced Materials for Sustainable Industrial and Social Applications (NSAMSISA-2020), Faculty of Science, Govt. Pt. Shyamacharan Shukla College Dharsiwa, Raipur, (CG), January 17-18, 2020. (Oral presentation)

I) Invited Talks / Session Chair:

- i. Invited as a speaker in national webinar on "Advances on Modern Physical Sciences" (AMPS-2020) at Panchmura Mahavidyalaya (affiliated to Bankura University), West Bengal, September 14, 2020.
- ii. Chaired a session in 1st Odisha International Conference on Electrical Power Engineering, Communication and Computing Technology (ODICON-2021)

- organized by Department of Electrical Engineering, Siksha O Anusandhan Deemed to be University, Bhubaneswar, India; January 8-9 2021.
- iii. Invited to deliver a talk in the International Online Conference on Nano Materials (ICN 2021) held at Mahatma Gandhi University, Kottayam, Kerala, India, from April 9-11 2021.
- iv. Chaired a session in the International Online Conference on Nano Materials (ICN 2021) held at Mahatma Gandhi University, Kottayam, Kerala, India, from April 9-11 2021.
- v. Deliver an invited talk in the two days National Conference on Recent Progress and Developments in Pharmaceutical Science organized by Expert Pharmacy Association (A Unit of Expert Group of Education and Welfare Trust) Registered under I.T.A (Govt. of India), New Delhi, India, May 15-16, 2021.
- vi. Invited to deliver a talk in International Conference on Recent Innovation and Modern Advancements in the field of Pharmaceutical Technology organized by SCPM College of Pharmacy Haripur Gonda in association with Indian Pharma Educational Society, May 29-30, 2021.
- vii. Chaired a Scientific Session entitled "Environmental Disasters and Newer Technologies to Reduce the Burden" as Honorable Chairperson at the National Seminar on "Environmental Sciences, Newer Technology, and Natural Products" Organized by Expert Pharmacy Association in collaboration with Durgesh Nandini College of Pharmacy, Charera, Ayodhya, Uttar Pradesh on June 5, 2021.
- viii. Invited to deliver a talk in the International Online Conference on Nano Materials (ICN 2022) held at Mahatma Gandhi University, Kottayam, Kerala, India, from August 12-14, 2022.

J) Course / School / FDP attended:

- Selected as a participant for "Fourth Refresher Course in Materials Preparation and Measurement of Properties" at Indian Academy of Science, Jalahalli, Bangalore-560013, February 10-25, 2015.
- Selected as a participant for "DST Nano-mission School on Nano-science and Nano-technology- Physical Science: Emerging Materials and Methods in Nanoscience & Nano-technology" at Centre for Nano and Soft Matter Sciences, Jalahalli, Bangalore-560013, Oct 23- Nov 3, 2017.
- iii. Faculty Development Program (FDP) under the scheme of AICTE Training and Learning (ATAL) Academy on Nano-materials, Characterization & their Application organized by Department of Physics, Indira Gandhi National Tribal University, Amarkantak, December 06-10, 2021.

K) Award Received:

- Received '<u>Best Paper Award</u>' (oral presentation category) at 3rd International Conference on Recent Advancements in Chemical, Environmental & Energy Engineering; SSN College of Engineering, Chennai, Tamilnadu, India; 15-16 February 2018.
- ii. Received the certificate of "*Excellence in Academics*" in the session 2019-2020 from Chouksey Group of Colleges, Bilaspur, C.G. 2nd February 2021.
- iii. 3rd position in oral presentation category at National Seminar on Characterization and Processing of Advanced Materials (NSCPAM-2021); Department of Physics, Govt. Pt. Shyamacharan Shukla College, Dharsiwa, Raipur (CG) June 26, 2021.

L) Membership:

➤ Life member of Indian Society for Particle Accelerators (ISPA) (Membership no. LM-384).

Other Information:

Journal refereed: i) Scientific Report (Nature Publishing Group)

- ii) Artificial Cells, Nanomedicine, and Biotechnology (Taylor & Francis Group)
- iii) Journal of Physics and Chemistry of Solids (Elsevier)
- iv) Journal of the Australian Ceramic Society (Springer)

Research Collaboration:

- a) Dr. V. S. Tiwari, Scientist-D; Raja Ramana Center for Advanced Technology, Indore; India.
- b) Dr. Rachana Selvamani, Scientist-F; Raja Ramana Center for Advanced Technology, Indore, India.
- c) Dr. Ajay Kumar Himanshu, Scientific Officer-D; Variable Energy Cyclotron Centre, Kolkata, India.
- d) Dr. Vanga Ganesh, Assistant Professor, Department of Physics College of Science, King Khalid University, Post Box- 9004, Abha-61413, Kingdom of Saudi Arabia.

References:

1. Dr. H. S. Tewari, Associate Professor, Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G.

Email: tewari.hs@gmail.com; Mob: +91-9424140587

2. Prof. P. K. Bajpai, Head of the Department, Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G.

Email: bajpai.pk1@gmail.com; Mob: +91-9424154024

- 3. Prof. G. D. Varma, Professor, and Head of the Department, Department of Physics, Indian Institute of Technology, Roorkee, Roorkee, Uttarakhand 247667 Email: gdvarfph@iitr.ac.in; Mob: +91-9456318358
- 4. Prof. R. N. P. Choudhary, Professor, Department of Physics, Siksha O Anusandhan University (Deemed to be University), Bhubaneswar, Odisha-751030 Email: crnpfl@gmail.com; Mob: +91-6201955198

Declaration:

I hereby declare that the above-written particulars are true to the best of my knowledge and belief.

Date: 22.03.2022 Place: Bilaspur, C.G.

(Dr. Manojit De)