



**Shri Ram College, Muzaffarnagar
(Faculty of Fine Arts)**

Date: 20 Nov 23

To,
The Director
Ram Jewellers,
Muzaffarnagr, UP

Subject: Heartfelt gratitude for supporting our students with ₹40,000 for designer collection of ornaments.

Dear Shri Ram Jewellers, Muzaffarnagar

On behalf of Dr Manoj Dhiman, Dir- Fine Art, I extend our heartfelt thanks for your generous contribution towards our heartfelt gratitude for supporting our students with ₹40,000 for designer collection of ornaments. Your support has been instrumental in empowering our talented student to bring their creative vision to life.

Your sponsorship not only facilitated the realization of this collection but also motivated students to strive for excellence. It is partnerships like yours that enable aspiring designers to achieve their dreams and set a foundation for their future success.

We deeply appreciate your commitment to nurturing creativity and supporting emerging talent. Please feel free to visit Fashion Splash 2023 to witness the results of your invaluable support.

Thank you once again for your generosity and belief in our mission. We look forward to staying connected and collaborating in future endeavors.

Warm Thanks & Regards,


Dr Manoj Dhiman
Director- Fine Arts
Shri Ram College, Mzn


Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar


Chairman
IQAC, Shri Ram College,
Muzaffarnagar

Fashion Splash 2023 (A Fashion Week) (International Fashion Show)
Organized By
Faculty of Fine Arts

Fashion Splash 2023, a vibrant fashion show, received generous sponsorship contributions for its **Student Fashion Show Collection** segment. The sponsor amounts were as follows:

The students who receive this amount as assistants are as follows:

₹40,000 (Ram Jewelers, Muzaffarnagar)

- 1- Ritik Kumar
- 2- Laiba Noor
- 3- Adeeba
- 4- Nishita
- 5- Shruti Gupta
- 6- Saloni
- 7- Seema
- 8- Anam khan
- 9- Akansha Sharma
- 10- Ritika Goel


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SHRI RAM COLLEGE, MUZAFFARNAGAR
DEPARTMENT OF BASIC SCIENCE AND HOME SCIENCE
REPORT

Two- Days International Seminar

on

Contemporary Health Challenges in the Current Social and Ecological Perspective
(30TH -31ST May, 2024)

Venue: Auditorium, Shri Ram College

Sponsored By: Indian Medical Association Muzaffarnagar

A two-day international seminar on the topic of "Contemporary Health Challenges in the Current Social and Ecological Perspective" was sponsored by Indian Medical Association, Muzaffarnagar and funded Rs. 11,000 for the successful organization of this programme. It was jointly organized by the Basic Science Department and the Home Science Department of Shri Ram College. The chief guest of the first day of seminar was Dr. Ishwar Chandra, Treasurer, Indian Medical Association, Muzaffarnagar. As special guests, Dr. S.C. Kulshreshtha, Founder, Shri Ram Group of Colleges, Dr. Perna Mittal, Principal, Shri Ram College, Dr. SN Chauhan, Director, Shri Ram Group of Colleges, Dr. Ravindra Pratap Singh, Director (Research), Muzaffarnagar, Dr. Vineet Kumar Sharma, Dean Academics, Shri Ram College, Dr. Suchitra Tyagi, Dean, Shri Ram College of Engineering lit the lamp. After lighting the lamp, Dr. Pooja Tomar, Head of the Basic Science Department and Dr. Shweta Rathi, Head of the Home Science Department welcomed all the guests by giving them bouquets.

Dietician Dr. Ayushi Agarwal, Chief Social Worker, Dr. Anuradha Verma and Professor Dr. Shuchi Mittal from SD College Muzaffarnagar were the chairpersons of the program, on the first day of this program, Poster exhibition and oral speech were organized. Various participants expressed the negative effects of current social scientific and environmental activities through their posters and the measures to prevent them. On this occasion, the chief guest of the program, Dr. Ishwar Chandra, while presenting his views, described the effects of current social and ecological activities on human health, diseases and efforts to prevent them and answered all the questions asked by the students in detail. He also told that maintaining physical and mental balance is also an essential task for health.

The main speaker of the program, dietician Dr. Ayushi Agarwal, in her speech also explained the importance of a balanced diet as well as a stress-free lifestyle. Dr. Shuchi Mittal, Professor, SD College Muzaffarnagar said in her speech that in the changing social and scientific life, physical exertion and other factors such as stress-free environment, adequate sleep, nutritious diet are also necessary. Expressing gratitude to the chief guest of the seminar, Dr. Ishwar Chandra, the founder Dr. SC Kulshreshtha presented him with the logo of the college.

Giving information on this occasion, the Head of the Department of Basic Science, Dr. Pooja Tomar said that in this seminar, about 200 students registered themselves and expressed their views on many topics in the form of their presentation. After this, prizes were also distributed by the chief guest for the presentation of the selected students.

In the end, Principal of Shri Ram College, Dr. Perna Mittal thanked all the chief guests, the students present and all the members of the organizing committee.

On the Second Day, The chief guest was Professor (Dr.) HS Singh, Vice Chancellor, Maa Shakumbhari University, Saharanpur. The special guests were Dr Poonam Sharma, President, Shri Ram College; Dr Naresh Malik, Principal, Chaudhary Chhotu Ram PG College, Muzaffarnagar; Dr Garima Jain, Principal, DAV College, Muzaffarnagar; Dr Sudhir Pundir, Principal, SD College Muzaffarnagar; Dr Perna Mittal, Principal, Shri Ram College Muzaffarnagar; Dr SN Chauhan, Director, Shri Ram Group of Colleges; Dr Ravindra Pratap Singh, Director (Research), Shri Ram Group of Colleges, Muzaffarnagar; Dr Vineet Kumar Sharma, Dean Academics & Dr Suchitra Tyagi, Dean of Shri Ram College of Engineering, Muzaffarnagar.

The program was started by lighting the lamp by the chief guest and all the special guests. After this, Whole Organizing team welcomed all the guests by giving them bouquets. Dr. Varun Chaudhary, Assistant Professor, Chalmers University, Sweden and Senior Researcher Dr. Richa Chaudhary, Assistant Professor, Chalmers University, Sweden, Dr. Seema Rani, Associate Professor, MLN PG College, Saharanpur, Senior Physiotherapist Neelam

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Agarwal, Chief Social Worker Mrs. Sonia Luthra and Senior Physician Dr. Mitali Agarwal were present as the speaker of the program,

On this occasion, Chief Guest Professor HS Singh, Vice Chancellor of Maa Shakumbhari University, Saharanpur, while encouraging the students, highlighted the ecological and social factors that affect our immunity. He said that the type of food we take affects our health.

After this, the main speaker of the program, Dr. Varun Chaudhary told about the research and efforts done at the scientific level to solve health challenges. He told that the use of magnetic nanomaterial has also proved to be very beneficial in today's physical diseases.

The keynote speaker, Dr. Richa Chaudhary in her speech talked about some functional diets used to prevent chronic diseases and keep the body healthy. After this, Dr. Shishupal Bamotra, a senior doctor from Jammu and Kashmir, talked about the prevention of today's health challenges.

The main social worker Dr. Sonia Luthra told in her speech that it is necessary to remain stress free to remain physically healthy. In today's environment, the most important thing is to remain stress free, apart from this; she also presented her views about some important measures of stress management.

After this, prizes were distributed to the winners of the poster exhibition and oral speech held on the first day. Simran got the first place in poster exhibition, Firdous Zaidi and Almisba of B.Sc. (Home Science) got the second and third place respectively. In oral speech, Sara Mehak and Anagha Kulshreshtha of MBA got the first and second place.

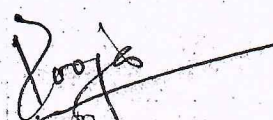
Dr. Naresh Malik, Principal of Chaudhary Chhotu Ram PG College, Muzaffarnagar, in his address, described the negative effects of the present-day social, scientific and ecological activities and the measures to prevent them, and encouraged all the participants.

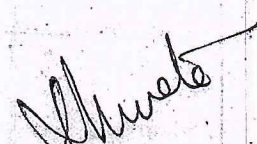
On this occasion, while thanking the chief guest of the seminar, Vice Chancellor of Maa Shakumbhari University Saharanpur, Professor HS Singh, the President of the college, Dr. Poonam Sharma and Principal of Shri Ram College, Dr. Prerna Mittal, honored him by presenting the insignia of the college and draping a shawl on him.

Giving information on this occasion, Dr. Pooja Tomar, Head of the Department of Basic Science, said that in this seminar, about 200 students registered themselves and expressed their views on many topics in the form of their presentation. After this, prizes were also distributed by the chief guest for the presentation of the selected students. T

At the end of the program, certificates were given to all the participants. In the end, Principal of Shri Ram Collège Dr. Prerna Mittal presented a Vote of Thanks to all the chief guests, students present and all the members of the organizing committee.


Dr. Manoj Kumar Mittal
Organizing Secretary


Dr. Pooja Tomar
Convener


Dr. Shweta Rathi
Convener


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National Seminar Report

on

“Empowering India: The Crucial Role of Micro, Small, and Medium Enterprises in the Viksit Bharat Mission by 2047”

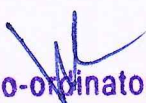
Sponsored By: Indian Industries Association, Muzaffarnagar Chapter

June 22, 2024



Organised By

Department of Commerce
Shri Ram College, Muzaffarnagar


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Muzaffarnagar


Chairman
IQAC, Shri Ram College,
Muzaffarnagar

Seminar Organising Committee

Patron-in-Chief:

Dr S C Kulshreshtha,
Founder Chairman, Shri Ram Group of Colleges

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Chairman IIA, Muzaffarnagar Chapter
Dr Mohammad Arif
Head & Assistant Professor Govt. PG College, Deoband
Saharanpur

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Dr Poonam Sharma,
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Seminar Vice-President

Dr Purna Mittal,
Principal, Shri Ram College, Muzaffarnagar

Seminar Director

Dr Saurabh Mittal,
Dean, Management Block Shri Ram College, Muzaffarnagar

Organizing Secretary

Dr Ashfaq Ali,
Head & Asso. Professor, Department. of Commerce Shri Ram
College, Muzaffarnagar

Convenor

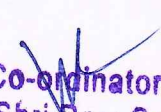
Dr Mohammad Shadab Khan,
Asso. Professor, Department. of Commerce Shri Ram College,
Muzaffarnagar

Co- Convenor

Ms Garima Singh,
Assistant Professor Department of Commerce Shri Ram College,
Muzaffarnagar

Member (s)

Mr. Mukesh Kumar, Ms. Shweta Garg, Mr. Abhishek Kumar, Mr.
Anuj Verma Ms. Madhavi Kaushik, Ms. Anika


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Dr Manoj Dhiman Director Shri Ram Girls College

Dr Vinit Kumar Sharma Dean, IQAC Shri Ram College

Dr Nishant Rathi Dean, Faculty of Computer Application Shri Ram
College

Dr Suchitra Tyagi Dean, Engineering Shri Ram Group of Colleges
(IC)

Dr Shweta Rathi Dean, Home Science, Shri Ram College

Er Kanupriya Chief Coordinator, CIFED, Shri Ram Group of College


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Seminar Report

One-Day National Seminar

on

"Empowering India: The Crucial Role of Micro, Small, and Medium Enterprises in the Viksit Bharat Mission by 2047"

On Dated 22nd June 2024

Organized by: Department of Commerce, Shri Ram College

Sponsored by: Indian Industries Association (IIA) Muzaffarnagar Chapter

The Department of Commerce, Shri Ram College, Muzaffarnagar successfully organized a one-day national seminar titled "Empowering India: The Crucial Role of Micro, Small, and Medium Enterprises in the Viksit Bharat Mission by 2047." Sponsored by the Indian Industries Association Muzaffarnagar chapter by Rs.11000/-. This seminar aimed to shed light on the pivotal role MSMEs play in achieving the ambitious vision of making India a developed nation by 2047. The main objectives of seminar are to explore the challenges and opportunities faced by MSMEs in India, to discuss innovative strategies for MSME growth and sustainability to identify policy-level changes required to strengthen MSMEs' contribution to the economy. to promote collaboration among stakeholders in the MSME ecosystem, including policymakers, industry leaders, and academia.

INAUGURAL SESSION

The seminar commenced with a formally lamp lighting in inaugural session through chief guest of Hon'ble Founder Chairman of Shri Ram Group of Colleges, Muzaffarnagar and guest of honour ADM(F) Mr. Gajendra Kumar, Chief Accountant Dehradun Dr Sateesh Pal, Chairman IIA Mr. Pawan Kumar Goel, Former Chairman IIA Mr. Kush Puri, President Shri Ram College Dr Poonam Sharma, SRGC(IC) Director Dr S N Chauhan, Director Research Dr RP Singh, Director Shri Ram College, Dr Ashok Kumar, Principal Shri Ram College, Dr Purna Mittal, Dean IQAC Dr Vineet Kumar & Dean Management Dr Saurabh Mittal.

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Seminar has started with the welcome note delivered by Dr Ravindra Pratap Singh & IIA Chairman Mr. Pawan Kumar Goel and Dr Ashfaq Ali, organizing secretary, outlined the objectives of the seminar, emphasizing the importance of MSMEs in achieving the Viksit Bharat Mission by 2047 and highlighted the need for collective efforts from all stakeholders to empower this sector.

KEYNOTE SPEECH:

Delivered by Dr Satish Pal on "Empowering India: The Crucial Role of Micro, Small, and Medium Enterprises in the Viksit Bharat Mission by 2047." Dr Pal provided an insightful overview of the transformative role of MSMEs in India's economic growth. He emphasized innovation, sustainability, and the need for robust government support to enhance MSMEs' contribution to the national GDP. Highlighting key challenges such as access to finance, technology adoption, and skill development, Dr Pal outlined a roadmap for empowering MSMEs to align with the Viksit Bharat Mission.

Inaugural session conclude remark delivered by Dr S C Kulshreshtha, Hon'ble Founder Chairman, Shri Ram Group of Colleges, it is my distinct honour and privilege to address this esteemed gathering today. As the Founder Chairman of Shri Ram Group of Colleges, I have always believed in the transformative power of education and the collective potential of our nation. Today, I wish to speak on a topic that is both inspiring and challenging: how India can achieve its aspirational targets in the years to come.

India, with its rich heritage and dynamic youth, stands on the cusp of unprecedented growth. Our aspirations encompass becoming a \$ 55 trillion economy by 2047, achieving net-zero carbon emissions, ensuring 100% literacy, providing universal healthcare, and fostering innovation to emerge as a global leader in technology and infrastructure.


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However, these ambitious goals demand a multifaceted approach and the active participation of every citizen. Let us delve into the strategies that can help us realize these aspirations. In next We must ensure that quality education reaches every corner of the nation, bridging the urban-rural divide. Introduce vocational training aligned with industry needs, fostering an ecosystem of entrepreneurship and employability. Leverage technology to make learning more inclusive and effective. Initiatives like digital classrooms, MOOCs, and AI-based learning tools can revolutionize education and he also highlighted the Modernizing roads, railways, ports, and digital connectivity to facilitate trade and mobility, small and medium enterprises are the backbone of our economy. Support through credit facilities, tax incentives, and skill-building will boost their growth Streamlining regulatory processes and fostering innovation through research and development. Expanding schemes like Ayushman Bharat to cover more citizens with quality medical services. Campaigns to raise awareness about hygiene, nutrition, and preventive healthcare. Use of AI, telemedicine, and mobile health apps to reach remote areas and many more and at last he said I urge each one of you to contribute in your capacity—be it as educators, policymakers, entrepreneurs, or students. Together, let us embark on this transformative journey and create a legacy that future generations will be proud of.

Thank you, and Jai Hind!

TECHNICAL SESSION (S) HIGHLIGHTS

The Technical Session focused on in-depth discussions and expert insights into the role of MSMEs in achieving the Viksit Bharat Mission by 2047. Chaired by **Dr Prerna Mittal** and co-chaired by **Dr Vineet Kumar**, the session featured a series of presentations by distinguished speakers, including policymakers, industry leaders, and academic experts. In this session Professor Dr Sudhanshu Joshi from Doon University highlighted detail contribution of Supply Chain Management and MSMEs contribution in Viksit Bharat Mission 2047. In sequence of


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session Professor, A K Mishra, MGKVP Banaras, highlighted role of economic development and how India achieves Viksit Bharat Mission by 2047. A panel of experts deliberated on "Innovative Strategies for MSME Growth and Sustainability, leveraging digital technology to enhance operational efficiency, promoting green and sustainable business practices within MSMEs, Facilitating better access to financial resources and credit facilities, Successful MSME entrepreneurs shared their experiences, providing real-world insights into overcoming challenges and capitalizing on opportunities. The audience actively participated in a Q&A session, addressing concerns related to regulatory hurdles faced by MSMEs, Strategies for skill development and workforce enhancement and Collaboration opportunities between academia and industry to foster innovation.

VALEDICTORY SESSION: This seminar concluded with a valedictory session address by Mr. Ankit Singhal, Chairman, Federation of Muzaffarnagar Commerce & Industry. Mr. Singhal appreciated the Department of Commerce, Shri Ram College, for organizing such an impactful seminar that brought together various stakeholders in the MSME ecosystem. He emphasized the crucial role of MSMEs as the backbone of India's economy, contributing significantly to GDP and employment. Highlighted the need for simplified regulatory frameworks to ease the burden on MSMEs. Advocated for enhanced access to financial resources and technology. Stressed the importance of fostering innovation and skill development within the sector. Mr. Singhal shared his vision of MSMEs driving India's transformation into a developed nation by 2047, with a focus on self-reliance, sustainability, and global competitiveness. He urged policymakers, industry leaders, and academic institutions to work collectively to empower MSMEs and achieve the goals of the Viksit Bharat Mission. Mr. Singhal's address concluded with a note of optimism and a commitment to continuous efforts in strengthening the MSME ecosystem.


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CONVENING EFFORTS

The seminar was convened by **Dr M.S. Khan** and **Ms. Garima Singh**, whose dedication and leadership were instrumental in the event's success. Dr Khan and Ms. Singh envisioned the seminar as a platform to bring together diverse stakeholders, ensuring alignment with the objectives of the Viksit Bharat Mission. They meticulously planned the agenda, selecting themes and topics that resonated with the seminar's goals, and invited speakers who could provide valuable insights. They actively engaged with attendees, encouraging participation in discussions, Q&A sessions, and networking activities.

PARTICIPANTS

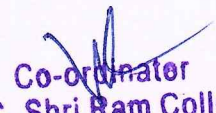
The seminar witnessed participation from 56 delegates, including:

- 400 plus students from department of Commerce and faculty members from various department of Shri Ram College.
- Industry professionals and entrepreneurs.
- Policy analysts and representatives from government agencies.

The seminar underscored the crucial role of MSMEs in the journey towards a developed India by 2047. It served as a platform for meaningful dialogue among policymakers, industry leaders, and academia, fostering collaboration and innovation within the MSME ecosystem. Participants gained valuable insights into overcoming challenges and leveraging opportunities to empower.

ACKNOWLEDGMENTS

On behalf of the Department of Commerce, I Dr Ashfaq Ali, Organizing Secretary expresses gratitude to the Indian Industries Association for their sponsorship and support. Special thanks to Hon'ble Founder Chairman SRGC, All Speakers, Panellists, and Participants for making the seminar a grand success. Thank You So Much!!!


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Muzaffarnagar


(Dr Ashfaq Ali)
Organising Secretary
Chairman
IQAC, Shri Ram College,
Muzaffarnagar



Report

on

“Design & development of a lines having resistance to bacterial leaf blight and blast through marker assisted selection in Rice”

An sponsorship based project between the

**Shri Ram College,
Muzaffarnagar**

Collaborated with

**Green Land Agro Pvt. Ltd.
Muzaffarnagar**

Session : 2023-24

**SUBMITTED BY:
Department of Agriculture
Shri Ram College, Muzaffarnagar**

**Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar**

**Chairman
IQAC, Shri Ram College,
Muzaffarnagar**

**GREEN LAND AGRI MARKETING INDIA PVT LTD.**Khasra No. 457, Village- Begrajpur, Meerut Road, Muzaffarnagar (U.P.)**Green Land**

To
The Principal,
Shri Ram College, Muzaffarnagar

Date: 20-05-2023

Respected Madam

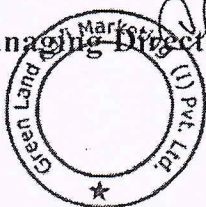
Greetings

Green Land Agro Pvt. Ltd. Known for developing genetically modified crops that are resistant to certain pests and herbicides. Green Land Agro produces and develops a wide variety of agricultural chemicals and crop protection products. Green Land Agro develops agricultural chemicals and crop protection products, including herbicides, insecticides, and fungicides. Produces a variety of agricultural chemicals and crop protection products, such as insecticides and fungicides. Green Land develops and produces agricultural chemicals and crop protection products, including herbicides and insecticides. Green Land Agro always aims to make and provide new methods as per the requirement of farmers. This time many farmers are in demand for natural disease resistant. So we want to create a positive natural disease resistant method by Shri Ram College, Muzaffarnagar. So that Green Land Agro Industries can provide this dryer to the farmers on time. Green Land Agro Industries requests to Shri Ram College to take a step forward in fulfilling its social responsibilities by helping in this work. The Green Land Agro Industries will always be ready to bear all the expenses incurred in this research.

Awaiting your reply on the above.

Vineet Kumar Baliyan

Managing Director



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Shri Ram College

Approved by UGC, NCTE and Affiliated to MS University, Saharanpur
Muzaffarnagar - 251001, NCR (U.P.)

A++ Grade Accredited by NAAC

Date: 24-05-2023

To

The Secretary

Green Land Agro Pvt. Ltd., Muzaffarnagar

Respected Sir

With reference to your letter, it gives me immense pleasure to inform you that Shri Ram College will be grateful to participate in Innovative contribution with Green Land Agro Pvt. Ltd. through the conduct of this research. We nominate Mr. Suraj Singh, Assistant Professor in the Department of Agriculture, as the Principal Investigator for the research.

Mr. Suraj Singh is a distinguished academician with extensive experience in teaching and research. His expertise in Plant Protection and significantly worker for this project. Mr. Suraj Singh has consistently demonstrated his ability to lead and deliver high-quality research outcomes. As the Principal Investigator, he will be responsible for overseeing the project, ensuring adherence to the proposed timeline and objectives, and contributing to the advancement of knowledge in the field. You are also requested to discuss regarding project expenses duration and total expected budget with him.

I am confident that Mr. Suraj Singh is expertise and commitment will make this project a success and bring significant recognition to our institution.

We extend our best wishes to him for the successful execution of this research endeavour.

Regards,

(Dr. Preena Mittal)

Principal, SRC

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Green Land

GREEN LAND AGRI MARKETING INDIA PVT LTD.

Khasra No. 457, Village- Begrajpur, Meerut Road, Muzaffarnagar (U.P.)

Date: 02-06-2023

To
The Principal
Shri Ram College, Muzaffarnagar

Subject: Sponsorship for Research Project and Requirement for Fund Utilization Report

Honourable Madam

The **Green Land Agro Pvt. Ltd., Muzaffarnagar**, is pleased to sponsor funds amounting to **20,000/-** for the research project titled **"Design & development of a lines having resistance to bacterial leaf blight and blast through marker assisted selection in Rice"** undertaken by your esteemed college. This initiative aligns with our vision of fostering innovation and contributing to the advancement of knowledge in areas critical to industrial and societal development.

We request that these funds be utilized strictly for the purpose outlined in the approved project proposal, including but not limited to (mention broad categories such as research materials, development, assessment & analysis, and reporting).

To ensure transparency and proper accountability, we kindly ask you to provide a detailed utilization report upon the project's completion. This report should include:

1. A summary of activities and outcomes achieved.
2. A financial statement detailing the allocation and expenditure of funds.
3. Copies of invoices, receipts, and any supporting documentation.

We value this collaboration and trust that the institution will make the most effective use of this sponsorship to achieve the desired outcomes. Should you require any additional assistance or clarification, please do not hesitate to reach out to us.

We look forward to receiving the utilization report and wish your institution great success in this research endeavour.

Yours sincerely,

Vineet Kumar Baliyan

Managing Director



Co-ordinator

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Muzaffarnagar

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IQAC, Shri Ram College,
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Contact - 9258263333, E-mail. - greenlandmzn@gmail.com



Shri Ram College

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Muzaffarnagar - 251001, NCR (U.P.)

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Project Fund and Completion Detail

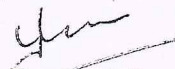
Date: 31-05-2024

1. Title of Project: "Design & development of a lines having resistance to bacterial leaf blight and blast through marker assisted selection in Rice"
2. Principal Investigator and Co-Investigator: Mr. Suraj Singh, Shri Ram College, Muzaffarnagar.
3. Implementing College and Sponsored Body: Department of Agriculture, Shri Ram College & Green Land Agro Pvt. Ltd., Mansurpur, Muzaffarnagar
4. Sanctioned Project Amount by Green Land Agro Pvt. Ltd., Mansurpur, Muzaffarnagar: Rs. 20,000/-
5. Project Duration: June 2023 to May 2024
6. Project Completion Date: May 31st, 2024

Statement of Expenditure

Amount Received	Rs. 20,000/-
Expenditure:	
Non Consumable Materials	12,000/-
Consumable Materials	3,000/-
Printing & Stationary	3,000/-
Travels	2,000/-
Grand Total	20,000/-


(Mr. Suraj Singh)
Research Project Coordinator


(Dr. Prerna Mittal)
Principal Shri Ram College


Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar


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REPORT

INTRODUCTION

Rice (*Oryza sativa* L.) is an oldest domesticated cereal grain (~10, 000 years) and is the top most consumed staple food for more than 65% of the world's population. Globally, rice is cultivated in an area of 162.34 million hectares with a production of 501.96 million metric tonnes and a productivity of 3.09 metric tonnes hectare⁻¹ where, 90% of the total rice comes from Asia (FAO, 2020). India stands first in area, second in production and contributing about 45% of cereals (Agricultural statistics at a glance, 2016). Rice is grown in diverse ecosystems of India. During 2019-20, India's rice production was 120 million tonnes from 44.5 million hectares area with an average productivity of 2.69 metric tonnes hectare⁻¹ (Department of Agriculture, Cooperation & Farmers Welfare, and Annual report, 2019-2020). Rice forms an important role in the dietary needs of Andhra Pradesh and is cultivated under 3.80 million hectares with 11.56 metric tonnes production and 2.85 tonnes hectare⁻¹ productivity.

Rice is economically and culturally the most important dietary food crop and sufficient rice production is considered as the solitary principle economic activity on the planet (Gnanamanickam, 2009). It plays a pivotal role as predominant nutritive energy source with 21% of calories in the average diet for two thirds of the population (Laskowski *et al.*, 2019). The productivity of rice is being seriously limited by a number of biotic and abiotic stresses and reports suggests that approximately 30% of global rice production is lost annually owing to the damage caused by biotic stress factors only (Vo *et al.*, 2021). Among the biotic stresses, blast and bacterial leaf blight are important diseases that are with the potential to significantly reduce the grain yield (or) value of crop worldwide.

Bacterial Leaf Blight (BLB) or Bacterial Blight (BB) is caused by *Xanthomonas oryzae* pv. *oryzae* (Xoo). It affects the rice plant at the seedling stage (kresek phase) and tillering stage (leaf blight phase) where affected leaves develops grayish green colour and roll up. As the disease advances, leaves turn yellow to straw coloured and wilt which leads to whole seedlings to dry up and plants will die. The disease occurrence is seen in both tropical and temperate conditions, especially in irrigated and rainfed lowland areas. It is also commonly seen in places where strong winds and continuous rains occurs. The disease is severe in susceptible rice varieties

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that are treated with high nitrogen fertilizer and causes yield losses ranging from 74-81% (Srinivasan and Gnanamanickam, 2005). It is one of the most destructive rice diseases in Asia and has historically been associated with major epidemics (Naqvi, 2019). It occurs in China, Korea, India, Indonesia, Philippines, Sri Lanka, Taiwan, Laos, Myanmar, Thailand and Vietnam (Singh *et al.*, 2001, Verdier *et al.*, 2011 and Yen, 2020). The disease has also presence in Africa and Northern Australia.

The current level of production may not be sufficient to feed the ever increasing population of our country indicating concerted efforts to increase the rice productivity and minimize production losses due to pests and diseases. Even though the introduction of high yielding varieties, development and adoption of modern rice production technologies led to progressive growth in rice production and it had also inadvertently increased the genetic vulnerability of the crop to pest and disease outbreaks leading to epidemics in several countries (Jamaloddin *et al.*, 2021). Chemical control measures of these rice diseases are cost ineffective and environmentally unsafe. Hence, development of resistant genotypes carrying major resistance (R) gene(s) has been the most effective and economical strategy to control diseases to have a neutral effect on the environment (Gous *et al.*, 2016). However, several resistant varieties bred for the disease resistance have shown breakdown in resistance for blast and BLB diseases and which lead to yield instability in rice growing areas. Of the various strategies tried, enhancing host-plant resistance is considered as one of the effective and attractive approaches to tackle these diseases (Chukwu *et al.*, 2020 and Angeles *et al.*, 2020). Pyramiding of two or more effective resistance genes/alleles into elite rice lines enhances the durability and broaden the spectrum of disease resistance.

Shri Ram College, Muzaffarnagar has earlier developed a high-yielding BLB resistant variety in the background of Samba Mahsuri named, Improved Samba Mahsuri (Sundaram *et al.*, 2008), which possess three major BLB resistance genes, viz., *Xa21*, *xa13* and *xa5*. It has the important characteristics of Samba Mahsuri i.e., fine-grain along with shorter duration (130 days). Similarly, Madhavi *et al.* (2012 and 2016) developed Samba Mahsuri lines having *Pi54*, *Pi1* and *Pi2* at ICAR-IIRR along with monogenic lines having single blast resistance genes in the background of Improved Samba Mahsuri (ISM) and Samba Mahsuri. Recently, Swarna line having

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Pi2 was considered for release in Orissa and Uttar Pradesh states (AICRP proceedings, 2017).

In view of the importance of durable resistance to blast and bacterial leaf blight breeding in rice, the present investigation was conceptualized to generate pyramided lines for blast resistance in the background of ISM to broaden the blast and BLB resistance. Four monogenic blast resistance genes (*Pi9*, *Pi20*, *Pi40* and *Pita*) were transferred into the genetic background of ISM possessing three BLB genes (*Xa21*, *xa13* and *xa5*) and one blast resistance gene (*Pi54*) through Marker-Assisted Backcross Breeding (MABB) strategy. The present investigation was executed with the aim to develop digenic lines having resistance to blast and BLB through MABB with the following objectives.

Objectives of Investigation

1. Development of lines with two blast resistance genes in the background of Improved Samba Mahsuri.
2. Pyramiding of two blast genes (in various combinations) with two bacterial leaf blight genes.
3. Assessment of agro-morphological traits of pyramided lines.
4. Evaluation of resistance for blast and bacterial leaf blight in the pyramided lines.

REVIEW OF LITERATURE

2.1 Rice - The model monocot plant

Rice ($2n=24$), belongs to the genus *Oryza*, of the family Graminae or Poaceae. It is a model plant for the study of cereal genetics and genome organization due to its diploid nature and a small genome size of 430 Mb (Causse *et al.*, 1994 and Kurata *et al.*, 1994). It possesses a significant level of genetic polymorphism (McCouch *et al.*, 1988; Tanksley *et al.*, 1989 and Wang *et al.*, 1992). It includes more than 25 wild species, either perennial or annual, which are either diploid or tetraploid (Gowda *et al.*, 2003). The cultivated grass species are *Oryza sativa* (Asian rice), grown all over the world and *Oryza glaberrima* (African rice), cultivated only in West Africa.

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Rice is the only cereal that can withstand flooding and produces more calories to sustain a larger number of persons per unit of land than any other cereal in monsoonal areas (Chang, 1984). More than 90% of rice is produced in Asia, where China and India are the lead producers (Ramkumar *et al.*, 2011). However, the total area under rice cultivation has remained stable since 1980 (Khush, 1995), hence, enhancing yield is the only possible alternative to meet the anticipated higher demand of rice (Hossain *et al.*, 1996 and Mishra *et al.*, 2003) but the rice crop is prone to several biotic (pest and diseases) and abiotic stresses (drought, salinity, heat and cold stress). Biotic stresses greatly limit crop yield due to the constant pressure of diseases and pests, thus, there is an urgent need to develop crop varieties that can tolerate multiple stress.

Rice blast and Bacterial Leaf Blight (BLB) are the two major diseases at various states in India, particularly in the irrigated, rainfed lowland ecosystems. Management of these two diseases through application of chemicals/antibiotics is not commercially feasible and not effective (Devadath, 1989). Therefore, host plant resistance offers the most effective, economical and environmentally safe option for management of blast and BLB (Khush *et al.*, 1989). A large number of varieties have been developed by incorporating host plant resistance for blast and BLB (Narayanan *et al.*, 2002 and Singh *et al.*, 2012b).

2.2 The Rice Blast

2.2.1 The Pathogen: *Magnaporthe oryzae*

Rice blast disease is caused by the ascomycete fungus, *Magnaporthe oryzae* Barr. (anamorph *Pyricularia grisea* Sacc, synonym *Pyricularia oryzae* Cav.). It is a haploid filamentous fungus with a relatively small genome of ~40 Mb divided into seven chromosomes (Dean *et al.*, 2005). *M. oryzae* is becoming an excellent model organism for studying fungal phyto-pathogenicity and host-pathogen interactions. The highly variable and virulence nature of the fungus and its genetic plasticity make its control and management difficult. In addition to rice, this fungus can attack more than fifty other species of grasses, including barley, wheat, pearl millet and turf-grasses (Valent and Chumley, 1994). Unlike many phyto-pathogenic fungi such as the mildews and rusts, the rice blast fungus can be cultured on defined media, facilitating biochemical and molecular analysis. Early stages of the infection process, including

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germination, appressorium formation and penetration, can be studied in explants. Tools for molecular genetic manipulation have been well developed in the last decade and many genomic resources such as EST, BAC, physical map and the draft sequence of the pathogen are now publicly accessible. One of the big issues resulting from the prediction of the genes encoded in the *M. oryzae* genome is that this pathogen contains more genes than its non-pathogenic cousins, *Neurospora crassa* and *Aspergillus nidulans* (Dean *et al.*, 2005).

2.2.2 History and Distribution of the disease

Rice blast was described over 350 years ago and it was known as rice fever disease in China as early as 1637. It was reported as Imochi-byo in Japan in 1704, and Brusone in Italy in 1828. It was reported in the USA as early as 1876. In India, blast was first recorded in 1913 and the first devastating epidemic was reported in 1919 in the Tanjore delta of Madras state. A four per cent reduction in yield due to blast was estimated for the first time in India and the total loss due to blast was 266,000 tonnes during 1960-1961 (Padmanabhan, 1965). Seven epidemics of blast were reported between 1980 and 1987 in the states of Himachal Pradesh, Andhra Pradesh, Tamil Nadu and Haryana resulting in huge yield losses (Sharma *et al.*, 2012).

Blast is found in approximately 85 countries throughout the world. In temperate and subtropical Asia, blast affects lowland and upland rice. Recurrent blast epidemics are reported from the Sub-Himalayan regions of Jammu and Kashmir, Himachal Pradesh, hill districts of Uttaranchal and West Bengal. It is one of the most destructive diseases in upland rice growing areas of Arunachal Pradesh, Manipur, Mizoram, Meghalaya, Assam, Chotanagpur region of South Bihar, Chhattisgarh and Bastar regions, and Jaipur tracts of Odisha. In peninsular India, blast epidemics were reported from Andhra Pradesh, Tamil Nadu and Coorg region of Karnataka. In Western India, it was of considerable importance in Karnataka, Maharashtra and Gujarat (Sharma *et al.*, 2012).

2.2.3 Economic Importance and Yield loss

Blast is common and predominant in all most all rice growing areas across the world and causes 97% yield loss under favorable conditions (Khush and Jena, 2009). Padmanabhan *et al.* (1963) reported a yield loss of 98% in Jammu and Kashmir while

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70% of yield loss was reported in Tamil Nadu by Rangaswamy and Subramanian, (1957) and in Uttar Pradesh by Mathur *et al.* (1964). Reddy and Bonman, (1987), reported a yield loss of 140,000 tonnes from three states, Andhra Pradesh, Karnataka and Tamil Nadu. Seven epidemics of blast were reported in Himachal Pradesh, Andhra Pradesh, Tamil Nadu and Haryana causing heavy yields losses during 1980 and 1984 (Nagarajan, 1988). Indeed, the Centers for Disease Control and prevention has recently recognized and listed rice blast as a potential biological weapon and no part of the world is safe from this disease. A 10% neck blast is reported to cause yield loss of 5-6% and causes chalky kernels. In India, more than 266,000 tonnes of rice were lost (about 0.8% of their total yield). In Japan, the disease was reported to occur in about 865,000 hectares of rice fields. In Philippines, yield losses ranging from 50-85% were reported before the introduction of resistant varieties (IRRI, 1983).

2.2.4 Favourable Conditions

Blast occurs under divergent agro-meteorological conditions in India. In high rainfall zones (Rainfall > 1500 mm, Temperature: 20-24°C) of North and North Eastern India, rice crop suffers due to this disease during June to September. In Western and Central India (Rainfall: 1000 mm, Temperature: 24-30°C) the disease occurs during August to October, whereas, blast incidence is primarily associated with dry periods and cooler nights (18-22°C) that are prevalent during November to February in Andhra Pradesh, Karnataka, Tamil Nadu and Kerala. The severity and damage caused by rice blast fluctuate year by year and from place to place. Early appearance of the disease was observed during April to July in Arunachal Pradesh, followed by West Khasi hills of Meghalaya during June-October, Cuttack, Ganjam and Koraput in Odisha during July to August, Hill Zones of Jammu and Kashmir during July to September, Manipur Central valley during July to October, most of the northern parts of the country during August to October, and in the Southern parts it continues up to February (Hashimoto, 1981 and Teng, 1994). In the tropics, blast spores are present in the air throughout the year, which makes the continuous development of the disease. The pathogen infects upland rice more severely than irrigated rice. Growing rice in aerobic soil in wetlands where drought stress is prevalent also favours infection. In the temperate countries, the pathogen exists over seasons in infected crop residues or in seed.

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2.2.5 Life cycle and Mode of infection

The life cycle infection by the rice blast fungus starts when the three-celled pyriform macro-conidium are produced on conidiophores which lands on a host leaf and anchors itself to the leaf cuticle with spore-tip mucilage. Germination proceeds with the extension of a germ tube, which undergoes hooking and swelling at its tip and then differentiates into an infection structure called the appressorium. During maturation, the appressorium becomes melanized, except for a well defined pore between the appressorium and the rice leaf (Howard and Valent, 1996). The formation of this infection structure on the host surface marks the onset of the disease. Fortuitously, *M. oryzae* is a tractable organism and has become the model fungus for studying appressorium driven infection reviewed by Talbot (2003) and Ebbole (2007). A penetration peg is then driven through the host surface and the infection hypha invades and grows through the rice leaf (Talbot, 2003). At this stage, the symptoms become evident and small oval lesions begin to appear, accompanied by local chlorosis. Eventually, the growing lesions become necrotic and may coalesce. Conidia are carried by air to neighboring plants and spreading the blast disease.

2.2.6 Symptoms of Rice blast

The fungus attacks the crop at all stages from seedlings in nursery to heading in main field. The typical symptoms appear on leaves, leaf sheath, rachis, nodes and even the glumes are also attacked. Ou (1985) and Pinnschmidt *et al.* (1994) described the typical symptoms of blast and the major symptoms of blast disease are shown in Plate 2.1.

2.2.6.1 Leaf blast: The symptoms on leaves may vary according to the environmental conditions, age of the plant, and the levels of resistance of the host cultivars. On the leaves of susceptible cultivar, the lesions may initially start as small water soaked bluish green specks, soon enlarge and form characteristic spindle shaped grey coloured lesion wide in center with dark brown margin and pointed towards either end. Under favorable conditions, as the disease progresses as the lesions expand rapidly and tend to coalesce, leading to complete necrosis of leaf and wither. Similar spots are also formed on the sheath. Severely infected nursery and field show a burnt appearance. On the resistant cultivars, lesions often remain small in size (1-2 mm) and brown to dark brown in color.

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2.2.6.2 Node blast and Collar blast: In infected nodes, irregular black areas that encircle the nodes can be noticed. The affected nodes may break up and all the plant parts above the infected nodes may die. The collar of a rice plant refers to the junction of the leaf and the stem sheath. Symptoms of infected collars consist of a general area of necrosis at the union of the two tissues. Collar infections can kill the entire leaf and may extend a few millimeters in and around the sheath. The fungus may produce spores on these lesions.

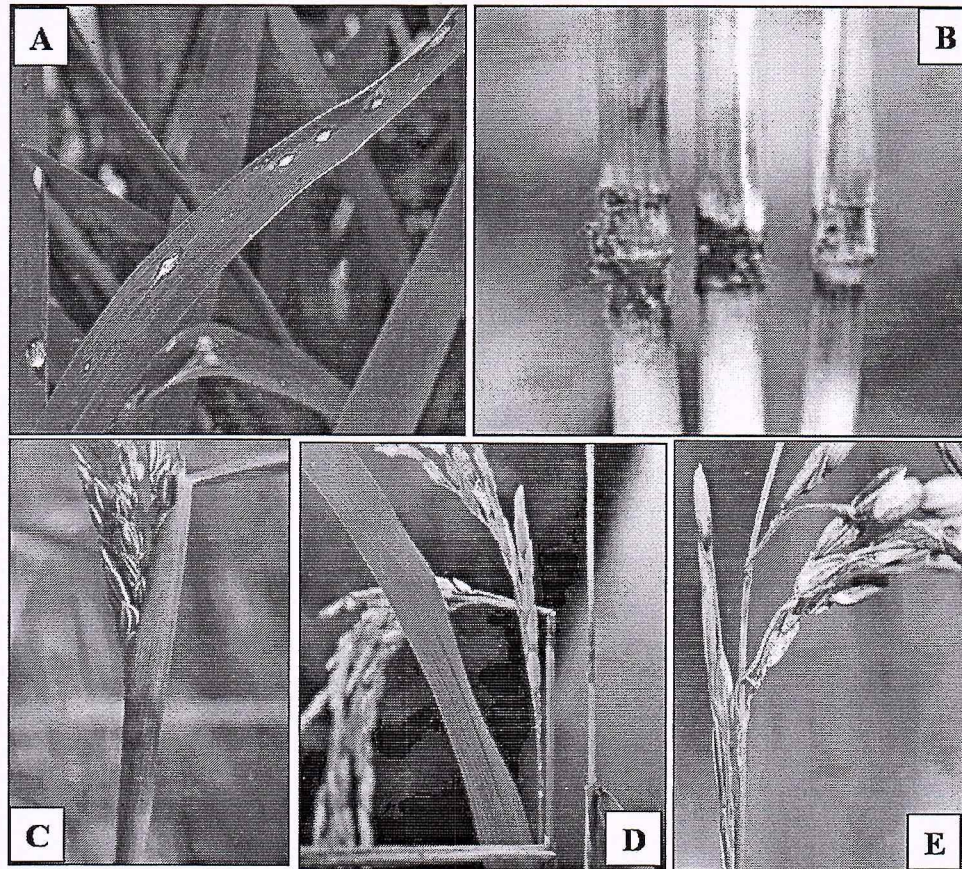


Plate 2.1: Symptoms of blast disease in rice (Source: Web images from Google)
(A) Leaf blast; (B) Nodal blast; (C) Collar blast; (D) Neck blast; (E) Panicle blast.

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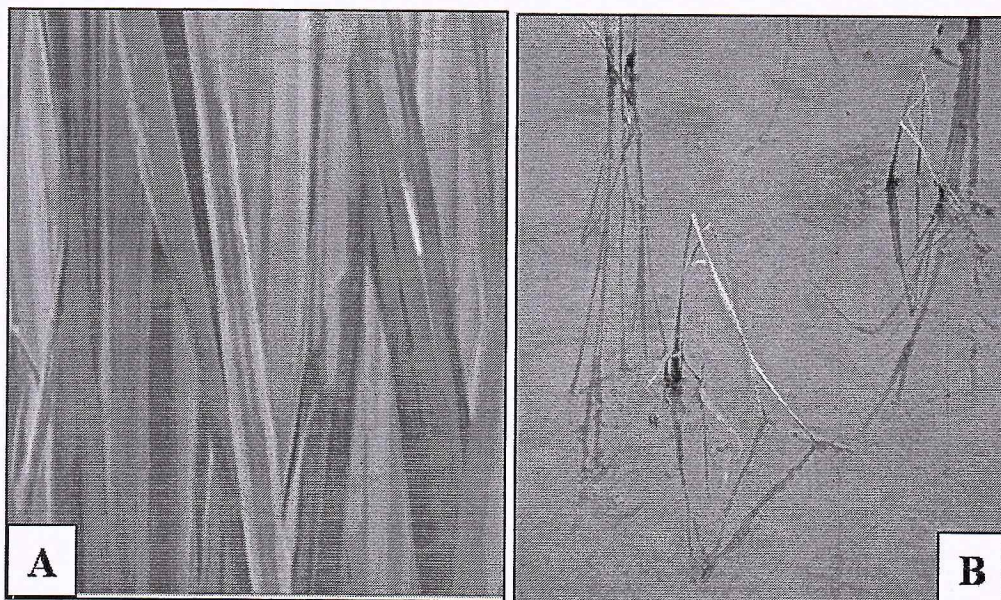


Plate 2.2. Symptoms of bacterial leaf blight disease in rice (Source: Web images from Google)

MATERIAL AND METHODS

3.1 Experimental location

The experiments of the present investigation entitled “Design & development of a lines having resistance to bacterial leaf blight and blast through marker assisted selection in Rice” were conducted at Crop Research Center, Shri Ram College, Muzaffarnagar, UP. The experiments were carried out for seven seasons from *kharif* 2023 to *kharif* 2024.

3.2 Plant materials

The plant materials used in the experiments were developed at and obtained from the Crop Research Center, Shri Ram College, Muzaffarnagar, UP. The monogenic line, ISM-ML^{Pi54}, which is high yielding, bacterial leaf blight (BLB) and blast resistant (*Xa21*, *xa13* and *xa5*; *Pi54*), medium slender grain stable improved line was used as recurrent parent while, four other monogenic lines viz., ISM-ML^{Pi9}, ISM-ML^{Pi20}, ISM-ML^{Pi40} and ISM-ML^{Pita} were used as donor parents. These lines are also of medium slender grain type, resistant to BLB (*Xa21*, *xa13* and *xa5*) and possess single blast resistance genes i.e., *Pi9*, *Pi20*, *Pi40* and *Pita* respectively. Detailed

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description of the plant materials along with target resistance genes and their chromosomal locations are presented in Table 3.1.

3.2.1 Recurrent parent

ISM-ML^{Pi54} is a monogenic line of Improved Samba Mahsuri possessing bacterial leaf blight genes *viz.*, *Xa21*, *xa13* and *xa5* and one blast resistance gene *i.e.*, *Pi54*. It is a high yielding, medium duration variety (124 days) with medium slender grain type possessing premium grain and cooking quality (Patroti *et al.*, 2019a).

3.2.2 Donor parents

Four donor parents *viz.*, monogenic lines of Improved Samba Mahsuri possessing three bacterial leaf blight genes (*Xa21*, *xa13* and *xa5*) and one blast resistance gene, ISM-ML^{Pi9}, ISM-ML^{Pi20}, ISM-ML^{Pi40} and ISM-ML^{Pita} (developed by ICAR-IIRR through marker-assisted backcross breeding) were used for introgression of targeted blast resistance genes *viz.*, *Pi9*, *Pi20*, *Pi40* and *Pita* through marker assisted backcross breeding (MABB) in the background of recurrent parent ISM-ML^{Pi54}.

3.3 Introgression of blast resistance genes, *Pi9*, *Pi20*, *Pi40* and *Pita* in the genetic background of ISM-ML^{Pi54} through MABB

3.3.1 Crossing programme

Four independent crosses were made between recurrent parent, ISM-ML^{Pi54} and the respective donors *i.e.*, ISM-ML^{Pi9}, ISM-ML^{Pi20}, ISM-ML^{Pi40} and ISM-ML^{Pita} during Rabi 2017-18. These four crosses were designated as Cross-I (ISM-ML^{Pi54} × ISM-ML^{Pi9}), Cross-II (ISM-ML^{Pi54} × ISM-ML^{Pi20}), Cross-III (ISM-ML^{Pi54} × ISM-ML^{Pi40}) and Cross-IV (ISM-ML^{Pi54} × ISM-ML^{Pita}).

Three staggered sowings of the parents (females and males) were undertaken at an interval of ten days to ensure synchronous flowering to produce adequate crossed seed. At booting stage, healthy female and male plants were uprooted and potted in the evening hours of the day into plastic buckets filled with mud and were transferred to the green house. In the female plants, the panicle about to flower on the next day were selected for emasculation and top 1/3rd of each floret was clipped off with small scissors (clipping method of emasculation) later anthers were removed

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using pointed forceps. The emasculation process was carried out during early morning hours, 6 A.M-9 A.M and emasculated panicles were covered with butter paper bags to avoid foreign pollen contamination. On the same day of emasculation, panicles ready for anthesis were selected from healthy male parents and were brought to the crossing chamber in which temperature, relative humidity and light conducive for anthesis were maintained. Butter paper bags covering emasculated panicles of the female parents were removed. Panicles of male parents were then gently shaken over the female parents until adequate pollen was deposited on the stigmas of the emasculated spikelets. Panicle with pollinated spikelets were then covered with fresh butter paper


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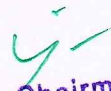

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Table 3.1. List of parents, target resistance genes and their chromosomal locations.

S. No	Parents	Parentage	Monogenic for blast gene	Chromosome Location	Agro-morphological traits	Reference
1	ISM-ML ^{Pi54}	ISM X Tetep	Pi54	11	Medium duration (124 days), early flowering (103 days), semidwarf (91cm), well exerted panicles with medium slender grain type	Patroti <i>et al.</i> (2019)a.
2	ISM-ML ^{Pi9}	ISM X IRBL9	Pi9	6	Medium duration (126 days), early flowering (98 days), semi dwarf (95 cm), well exerted panicles with medium slender grain type	Developed at ICAR-IIRR.
3	ISM-ML ^{Pi20}	ISM X Pi20 in Co-39 background	Pi20	12	Medium duration (127 days), early flowering (98 days), semi dwarf (98.4 cm), well exerted panicles with medium slender grain type	
4	ISM-ML ^{Pi40}	ISM X Pi40 in Co-39 background	Pi40	6	Medium duration (127 days), early flowering (107 days), semi dwarf (92.5 cm), well exerted panicles with medium slender grain type	
5	ISM-ML ^{Pita}	ISM X IRBL-Pita	Pita	12	Medium duration (128 days), early flowering (105 days), semi dwarf (97.5 cm), well exerted panicles with medium slender grain type	

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bags, duly labeled and tied with the pins. Crossed seeds were collected after three to four weeks from the date of pollination. The seeds were then sun dried, dehusked, counted and placed in small white envelopes with small amount of bavistin powder.

The F_1 seeds were treated with Bavistin (a fungicide) solution, rinsed with distilled water and germinated in a seed germinator for better germination. Four to five days old seedlings were then transferred to small earthen pots. Later, thirty days old seedlings were transplanted into field along with their respective parents. The hybridity of F_1 seeds was confirmed with the help of molecular markers viz., Pikh-MAS (for $Pi54$), NMSM Pi-9 (for $Pi9$), RM1337 (for $Pi20$), MSM-6 (for $Pi40$) and RM5364 (for $Pita$). The single true F_1 plant which was positive for the respective targeted blast resistance genes was backcrossed with recurrent parent ISM-ML ^{$Pi54$} during *Kharif* 2018 to produce the BC_1F_1 seeds. In *Rabi* 2018-19, all BC_1F_1 seeds derived from Cross I, Cross II, Cross III and Cross IV were raised and screened for the presence of target genes using their respective closely linked molecular markers. The BC_1F_1 plants possessing two target genes viz., $Pi54+Pi9$, $Pi54+Pi20$, $Pi54+Pi40$ and $Pi54+Pita$ among respective crosses with maximum recurrent parent genome (RPG) were selected and backcrossed with the recurrent parent to produce BC_2F_1 s during *Kharif* 2019. The positive BC_2F_1 plants for targeted genes were selfed during *Rabi* 2019-20 to generate BC_2F_2 for each independent cross. Later, homozygous blast digenic BC_2F_2 were identified and selfed to generate $BC_2F_{2,3}$ and pyramided lines possessing $Pi54+Pi9$, $Pi54+Pi20$, $Pi54+Pi40$ and $Pi54+Pita$ along with the BLB resistance genes $Xa21$, $xa13$ and $xa5$ with maximum recovery of the RPG were identified. Further, these pyramided lines were evaluated under field conditions for blast and BLB resistance along with agro-morphological, grain and cooking quality traits in *Kharif* 2020. The detailed procedure of crossing programme Plate 3.1 and MABB strategy for the targeted blast resistance genes is presented in Figure 3.1.

3.3.2 Marker-assisted selection for blast and BLB resistance genes

The detailed procedure of marker assisted selection employed in the development blast and BLB pyramided lines are described in following steps.

3.3.2.1 Collection of leaf sample : The leaf samples were collected for DNA isolation at 40 days after transplanting for further genotyping and stored at -80°C until subjected to DNA extraction. Leaf samples collected from the parents were tested for the target genes, from F_1 plants to determine the hybridity and from backcross derived population to carry out the genetic analysis.


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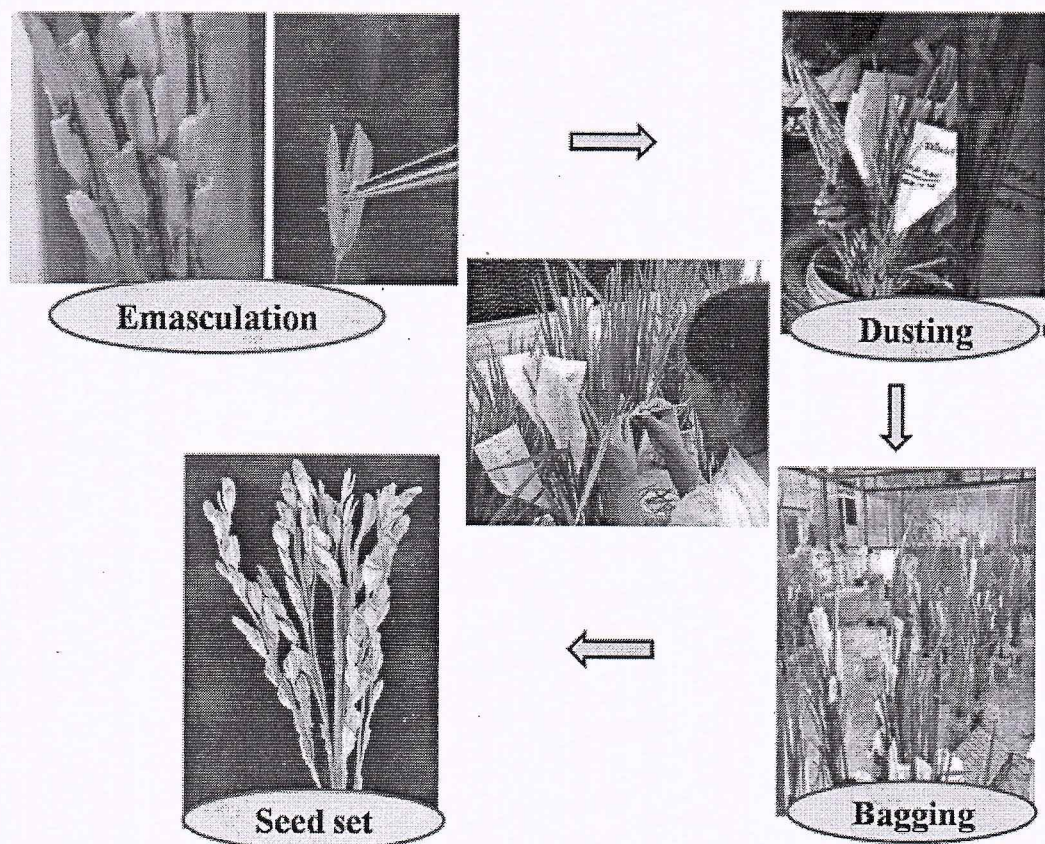
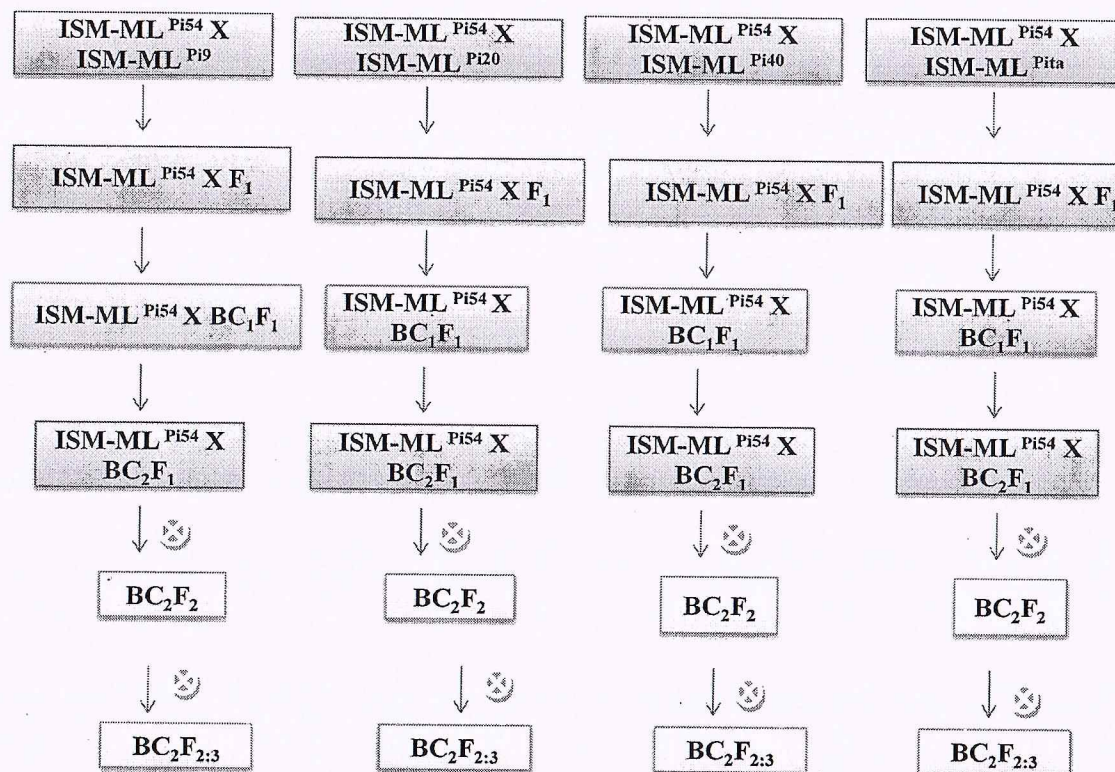


Plate 3.1. Schematic representation and steps involved in crossing of rice.

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Kharif 2017: Validation of Blast markers and F₁ production

(Due to poor seed set repeated in *Rabi* 2017-18

Kharif 2018 : Foreground selection in F₁ & generated BC₁F₁

Rabi 2018-19: Foreground and background selection BC₁F₁ and generated BC₂F₁

Kharif 2019: Foreground ,background selection in BC₂F₁ and generated BC₂F₂

Rabi 2019-20: Foreground, background selection in BC₂F₂ plants allowed for selfing to generate BC₂F_{2:3}

Kharif 2020: Phenotyping for Blast , BLB , yield and quality related traits BC₂F_{2:3}. Advancing to next generation.

Figure 3.1. Schematic work flow of Marker Assisted backcross Breeding.

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3.3.2.2 Extraction of genomic DNA : A mini preparation procedure was used to isolate genomic DNA from the collected leaf samples using Cetyl Tri Methyl Ammonium Bromide (CTAB) method (Doyle and Doyle, 1987). Step wise protocol for DNA extraction using mini-prep method (Zheng *et al.*, 1995) was explained as follows

- Young leaf tissue (about 0.5 g) was cut into small pieces and placed in a pre-cleaned well of spot test plate (Thomas Scientific).
- Pre-heated DNA extraction CTAB buffer (400 μ l) was added to each well of the spot test plate containing leaf tissue and was grounded with the help of a thick glass rod (polished like the end of a pestle for suitable grinding) till the contents of the well turns dark green which indicates cell breakage and release of chlorophyll.
- CTAB extraction buffer (400 μ l) was then again added to the existing contents in the spot test plate and was collected into fresh eppendorf tubes (2 ml) with the help of micropipette (1000 μ l capacity) with tips cut at the bottom using sterile scissors.
- The samples were kept in hot water bath at 65°C for 45 minutes to 1 hour and mixed by inversion of the contents in the tube for every 10 minutes.
- After incubation, the samples were removed from the hot water bath and were allowed to set at room temperature.
- Equal volumes of Chloroform: Isoamyl alcohol (24:1) was added to the solution and the contents were mixed thoroughly by gentle inversion for 10 minutes and centrifuged at 10,000 rpm for 15 minutes.
- The upper clear aqueous phase (~500-600 μ l) was carefully transferred into a new labeled eppendorf tube (1.5 ml), without disturbing the aqueous/organic layer interface.
- 2-3 μ l of RNase-A (10 mg/ml) was then added to the pipetted solution and incubated at 37°C for 30 minutes.
- After incubation, equal volumes of Chloroform: Isoamyl alcohol was added to the solution and mixed thoroughly and centrifuged for 15 minutes at 10,000 rpm and the upper clear aqueous phase (~500-600 μ l) was carefully transferred into a new labeled eppendorf tube (1.5 ml), without disturbing the aqueous/organic layer interface.
- Equal volumes of chilled Isopropanol was added, contents were mixed gently by inversion and tubes were kept in a -20°C freezer for 1 hour, the tubes were taken

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out from the freezer, gently mixed by inversion and centrifuged for 10 minutes at 10,000 rpm to pellet out DNA.

- The supernatant was discarded gently and the DNA pellet was washed with 150 μ l of 70% ethanol and centrifuged at 10,000 rpm for 5 minutes.
- The supernatant was discarded and DNA pellet was air dried at room temperature overnight. Once dried, DNA was suspended in appropriate volume of 1X TE buffer based on the size of the pellet and stored at -20°C for further use.

3.3.2.3 Quality and quantity assessment of the genomic DNA : Quality and quantity assessment of extracted DNA can be done by three different methods viz., Spectrophotometry, Agarose gel electrophoresis and Nanodrop. In the spectrophotometry, the DNA samples which exhibited the ratio of absorbance of ~1.80 at 260 nm and 280 nm was considered as pure DNA. The quantity of DNA in different samples varied from 50-1200 ng/ μ l. After quantification, all the samples were diluted to 50 ng/ μ l and were used for PCR reactions. Quantification of genomic DNA was also performed by running genomic DNA on 0.8% agarose gel with diluted λ (lambda) DNA as standard. Based on the intensity and thickness of genomic DNA bands when compared to λ (lambda) DNA, the concentration and quality of DNA in individual samples was determined (Dash *et al.*, 2020).

3.3.2.4 PCR Analysis : The Polymerase Chain Reaction (PCR) amplification was performed using veriti thermal cycler (Biotechnology laboratory, Ghaziabad, UP). PCR analysis was carried out in 96 well PCR (Watson biolabs) plates with 15 μ l volume for each reaction containing 1.5 μ l of 10X PCR buffer with $MgCl_2$ (Kappa), 1.5 μ l of 2.5 Mm DNTPs, 1 μ l of each forward and reverse SSR primer (10 μ M), 0.5 μ l of 3 U Taq DNA polymerase, 3 μ l of diluted genomic DNA (~50 ng/ μ l) and 7 μ l of nuclease free water. The PCR amplification cycling conditions were as follows, initial denaturation (94°C for 3 minutes), final denaturation (94°C for 30 seconds), annealing (50-58°C for 30 seconds), extension (72°C for 1-1.30 minutes) and final extension (72°C for 5-7 minutes) with 35 cycles (step 2, 3 and 4). Finally samples were stored in 4°C in cyclers. Gene-linked/gene-specific SSR markers were used for foreground selection viz., Pikh-MAS for *Pi54* gene, NMSM-*Pi9* for *Pi9* gene, RM1337 for *Pi20* gene, MSM-6 for *Pi40* gene, RM5364 for *Pita* gene, pTA248 for *Xa21* gene, xa13 prom for *xa13* gene and xa5FM for *Xa5* gene. The details of PCR components, amplification profile of SSR primers and amplification profile of gene-specific markers are given in Table 3.2, 3.3 and 3.4 respectively.

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3.3.2.5 Agarose gel electrophoresis procedure and visualization of amplified products : PCR amplified products were resolved in 3% agarose (9 g of agarose dissolved in 300 ml of 1X TAE buffer) gels in 1X TAE buffer at 100V for 2 hours in electrophoresis unit (iLIFE Biotech) containing 1X TAE, buffer solution. The sizes of amplified fragments were determined by comparing with 100 bp ladder (NEX-GEN DNA Ladder). The gels were stained with ethidium bromide (10 mg/ml) and placed over the UV-transilluminator and documented using Alpha imager 1200 system for documentation. The scoring pattern of amplified PCR products was varied in each assay and procedure is described in respective subheadings.

Table 3.2. PCR components and their composition.

PCR components		Stock concentration	Quantity required for 1 reaction (µl)
PCR buffer with MgCl ₂		10X	1.5 µl
DNTPs		2.5 Mm	1.0 µl
Primers	Forward	10 µM	1.0 µl
	Reverse	10 µM	1.0 µl
Taq DNA polymerase		3U	0.5 µl
Template DNA		40 ng/µl	3.0 µl
Sterile water		-	7.0 µl
Total			15 µl

Table 3.3. PCR amplification profile for SSR primers.

Profile	Steps	Temperature (°C)	Time	No. of cycles
1	Initial denaturation	94	3 Min	1
2	Denaturation	94	30 Sec	35
3	Primer annealing	55	30 Sec	
4	Extension	72	1 Min	
5	Final extension	72	5 Min	1
6	Storage/Cooling	4	∞	1

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Table 3.4. PCR amplification profile for gene specific markers.

Profile	Steps	Temperature (°C)	Time	No. of cycles
1	Initial denaturation	94	5 Min	1
2	Denaturation	94	45 Sec	35
3	Primer annealing	58	1Min	
4	Extension	72	1 Min 30 Sec	
5	Final extension	72	7 Min	1
6	Storage/Cooling	4	∞	1

3.3.2.6 Genotyping of parental lines for targeted genes : Recurrent parent ISM-ML^{Pi54} was verified for the 216 bp, 900 bp, 500 bp and 134 bp resistance alleles of *Pi54*, *Xa21*, *xa13* and *xa5* respectively while, donor-1 (ISM-ML^{Pi9}) was verified for the 168 bp, 900 bp, 500 bp and 134 bp resistance alleles of *Pi9*, *Xa21*, *xa13* and *xa5* respectively. In case of donor-2 (ISM-ML^{Pi20}) was verified for the 210 bp, 900 bp, 500 bp and 134 bp resistance alleles of *Pi20*, *Xa21*, *xa13* and *xa5* respectively. Donor-3 (ISM-ML^{Pi40}) was verified for the 256 bp, 900 bp, 500 bp and 134 bp resistance alleles of *Pi40*, *Xa21*, *xa13* and *xa5* respectively, while donor-4 (ISM-ML^{Pita}) was verified for the 148 bp, 900 bp, 500 bp and 134 bp resistance alleles of *Pita*, *Xa21*, *xa13* and *xa5* respectively. The plants that showed a pattern similar to the susceptible parent alleles were scored as '1' and those with a banding pattern similar to the resistant parent alleles were scored as '2' and the plants with heterozygous allelic pattern were scored as '3'. The scoring was done for the different combination of two blast with three BLB target genes in four independent crosses.

3.3.2.7 Parental polymorphism among parental lines using rice SSR markers : Parental polymorphism survey was carried between the four donor lines viz., ISM-ML^{Pi9}, ISM-ML^{Pi20}, ISM-ML^{Pi40}, ISM-ML^{Pita} and the recurrent parental line, ISM-ML^{Pi54} by using 1800 SSR markers which are equally distributed on all the 12 chromosomes of the rice. Among which 63, 57, 55 and 60 markers were showed polymorphism for Cross-I (ISM-ML^{Pi54}/ISM-ML^{Pi9}), Cross-II (ISM-ML^{Pi54}/ISM-ML^{Pi20}), Cross-III (ISM-ML^{Pi54}/ISM-ML^{Pi40}) and Cross-IV (ISM-ML^{Pi54}/ISM-ML^{Pita}) respectively.

$$\text{Polymorphism \%} = \frac{\text{No.of polymorphic markers}}{\text{Total No.of markers used}} \times 100 \text{ (Mohanty et al., 2017)}$$

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3.3.2.8 Foreground selection using gene specific/gene linked markers: Foreground selection was carried out for targeted blast resistance genes in F₁s using five gene-specific markers viz., Pikh-MAS (*Pi54*), NMSM-*Pi9* (*Pi9*), RM1337 (*Pi20*), MSM-6 (*Pi40*), RM 5364 (*Pita*) along with three BLB resistance genes using gene-specific markers viz., pTA248 (*Xa21*), xa13 prom (*xa13*) and xa5FM (*xa5*) respectively in each population. All the backcross derived lines were screened for the presence of target resistant genes at each generation. The details of the molecular markers used for the foreground selection were given in Table 3.5.

3.3.2.9 Background selection using polymorphic SSR markers : The background genome recovery (recovery of the recurrent parent genome) was calculated by using below mentioned formula (Sundaram *et al.*, 2008). The extent of donor parent segment introgression among the selected backcross derived plants was assessed utilizing the software tool, Graphical Genotype V 2.0 following the protocol described in Van, (1999).

$$G = \left[\frac{(X + \frac{1}{2}Y)}{N} \right] / 100$$

N = total number of parental polymorphic markers screened

X = number of markers showing homozygosity for recurrent parent allele

Y = number of markers showing heterozygosity for parental alleles

3.4 Evaluation of pyramided lines for agro-morphological traits

The agro-morphological traits of BC₂F_{2.3} populations which were resistant to both blast and BLB disease were measured under reproductive stage. Observations were made on five randomly selected plants and average utilized for descriptive statistical data analysis.

3.4.1 Days to 50% flowering

The total number of days taken from the date of sowing to complete exertion of the panicle tip above the sheath of the flag leaf on individual plant basis.

3.4.2 Plant height (cm)

The plant height was recorded by measuring the total height from the base of the plant to the tip of the main panicle and excluding awn if present.


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Table 3.5. Details of Gene-specific/ linked SSR markers used for foreground selection.

S. No.	Gene	Chr	Primer	Forward and reverse sequence information	Resistance allele size (bp)	Susceptible allele size (bp)	Annealing Temperature (°C)	Reference information
1	<i>Pi54</i>	11	Pikh-MAS	F - 5 ¹ CAATCTCCAAAGTTTTCAGG3 ¹ R - 5 ¹ GCTTCAATCACTGCTAGACC3 ¹	216	459	55	Ramkumar <i>et al.</i> (2011)
2	<i>Pi9</i>	6	NMSM- <i>Pi9</i> -1	F - 5 ¹ CGAGAAGGACATCTGGTACG3 ¹ R - 5 ¹ GAGATGCTTGGATTTAGAAGAC3 ¹	168	311	55	Devi <i>et al.</i> (2015)
3	<i>Pi20</i>	12	RM1337	F - 5 ¹ GTGCAATGCTGAGGAGTATC3 ¹ R - 5 ¹ CTGAGAATCTGGAGTGCTTG3 ¹	210	198	55	Li <i>et al.</i> (2008)
4	<i>Pi40</i>	6	MSM-6	F - 5 ¹ TGCTGAGATAGCCGAGAAATC3 ¹ R - 5 ¹ GCACCCTTTTCGCTAGAGG3 ¹	256	235	55	Devi <i>et al.</i> (2015)
5	<i>Pita</i>	12	RM5364	F - 5 ¹ GTATTACGCTCGATAGCGGC3 ¹ R - 5 ¹ GTATCCTTTCTCGCAATCGC3 ¹	148	120	55	Li <i>et al.</i> (2008)
6	<i>Xa21</i>	11	pTA248	F - 5 ¹ AGACGCGGAAGGGTGGTTCCCGGA3 ¹ R - 5 ¹ AGACGCGGTAATCGAAAGATGAAA3 ¹	900	700	58	Ronald <i>et al.</i> (1992)
7	<i>xa13</i>	8	xa13 promoter	F - 5 ¹ GGCCATGGCTCAGTGTTTAT3 ¹ R - 5 ¹ GAGCTCCAGCTCTCCAAATG3 ¹	500	300	55	Sundaram <i>et al.</i> (2008)
8	<i>Xa5</i>	5	xa5FM	SF- 5 ¹ GTCTGGAATTTGCTCGCGTTCG3 ¹ SR-5 ¹ TGGTAAAGTAGATACCTTATCAAACCTGGA3 ¹ RF - 5 ¹ AGCTCGCCATTCAAGTTCTTGAG3 ¹ RR- 5 ¹ TGACTTGTTCTCCAAGGCTT3 ¹	134	313	55	Hajira <i>et al.</i> (2016)

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3.4.3 Number of productive tillers plant⁻¹

The number of productive tillers plant⁻¹, which bear panicle were recorded at the time of maturity.

3.4.4 Panicle length (cm)

The length of the five randomly selected panicles in each plant was measured from the base to the tip and mean of it was expressed in centimeters (cm). Panicle length was measured at the time of harvest.

3.4.5 Panicle weight (g)

Five single panicles selected at random from single plant, weight of each panicle were measured in grams (g) and recorded the mean value of it.

3.4.6 Number of filled grains per panicle

The number of filled grains in five randomly selected panicles in individual plant was counted and recorded the mean value of it.

3.4.7 Spikelet fertility (%)

The ratio of number of filled grains to the total number of spikelets (filled+unfilled) per panicle in percentage.

$$\text{Spikelet fertility} = \frac{\text{Filled grains}}{\text{Total number of spikelets}} \times 100$$

3.4.8 1000 grain weight (g)

A total of thousand grains were counted from each plant and weighed with the help of an electronic balance in g plant⁻¹.

3.4.9 Grain yield per plant (g)

Panicles from a single plant were harvested at maturity, threshed, cleaned and dried to 12-14% moisture content and the weight was recorded in g plant⁻¹.

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3.5 Evaluation of pyramided lines for grain and cooking quality traits

The seeds of all the samples were stored at room temperature during the experimental work. Except for grain dimensions, all the other tests were conducted in duplicate, preferably on two different days using standard procedures. For determination of all rice properties other than their grain dimension, rice was allowed to age at least for 3 months or more at ambient temperature (25-30°C). The improved digenic lines along with parents were characterized for grain and cooking quality parameters *i.e.*, head rice recovery, kernel length, kernel breadth, length/width ratio (grain type), gelatinization temperature through alkali spreading value, amylose content and gel consistency as described below.

3.5.1. Head Rice Recovery (%)

3.5.1.1. Pre Cleaning : The sample was dried to bring down the moisture content to 12-14%. Moisture content was measured with moisture meter (Kett PM-600). The sample was cleaned thoroughly using winnower (Satake) manually to remove the chaffy and any other organic or inorganic foreign matter.

3.5.1.2. Hulling and Milling : Desired amount of paddy was subjected to dehusking in a standard dehusker/sheller (Kett TR-200). Dehusked kernels (brown rice) were then put into a standard polisher/miller (Satake TMO5A) (Plate 3.2). Time of the polisher was adjusted in such a way that percent polishing was ~5%. Then passed through rice grader having different (mm) grooves and for long slender grain the grooves should be 6.0 mm, where the whole grains were separated from the broken grains. The head rice recovery percentage was calculated as given below.

$$\text{Head Rice Recovery (\%)} = \frac{\text{Weight of whole grains (g)}}{\text{Weight of paddy seeds (g)}} \times 100$$

3.5.2 Grain Classification (Kernel length, breadth and L/B ratio)

The length and width of a rice grain are important attributes that determine the class of the rice. There are three main classes of rice, based on grain length: short, medium and long. In terms of width, Arborio styles are generally the widest, followed by short, medium and long. The ratio of the length and the width is used internationally to describe the shape and class of the variety. The other important aspect of length and width is uniformity of all the grains in one sample must look the same.


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After milling the polished rice was taken for computing the grain shape and size. Select a minimum of 10 full grains per sample where both the tips were intact and length and breadth were measured using Grain Shape Tester and Dial Micrometer (Satake MK-200). Average of length and breadth was taken in millimeters and length/breadth (L/B) ratio was calculated. Based on L/B ratio the grain type was classified as per Khush *et al.* (1979) and provided in tabular form (Table 3.6).

Grain length was classified as extra long (> 7.5 mm), long (6.61-7.5 mm), medium (5.51- 6.6 mm) and short (< 5.5 mm). Grain shape based on length-width ratio was classified as slender (> 3.0), medium (2.1-3.0) and bold (< 2.0) (Khush *et al.*, 1979).

Table 3.6. Classification of grain length and width of rice.

S. No.	Measurement ranges	Class
1	Length ≥ 6.6 mm, length/breadth ratio ≥ 3.0	Long Slender (LS)
2	Length ≤ 5.5 mm, Length/Breadth ratio ≥ 3.0	Short Slender (SS)
3	Length $< 5.51-6.6$ mm, Length/Breadth ratio 2.1-3.0	Medium Slender (MS)
4	Length ≥ 6.6 mm, Length/Breadth ratio ≤ 2.0	Long Bold (LB)
5	Length ≤ 5.5 mm, Length/Breadth ratio ≤ 2.0	Short Bold (SB)

(Source: Rice Research in India, ICAR Publication, 1985)

3.5.3 Determination of Amylose content (%)

Amylose content strongly influences the cooking and eating characteristics of rice. Rice with a high amylose content (25-30%) tends to cook firm and dry, whereas rice with a intermediate amylose content (20-25%) tends to be softer and stickier and rice with a low amylose content ($< 20\%$) is generally quite soft and sticky (Table 3.7). Waxy rice has zero amylose content and is often referred to as sticky rice. *Japonica* rice tends to be low amylose, tropical japonica tends to be intermediate or high and *Indica* rices fall into all the amylose classes.

Table 3.7: Amylose content in rice.

S. No.	Nature	Amylose %
1	Waxy	1-2%
2	Very Low	2-9%
3	Low	9-20%
4	Intermediate	20-25%
5	High	25-33%

(Source: Rice Research in India, ICAR Publication, 1985)

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During the cooking process, the starch granules in the grain expand and amylose leaches from them. As the cooked rice cools, the leached amylose chains line up, lock together and form a gel. In theory, the higher the amylose content of rice, the firmer the cooked grain of rice will be. Amylose is also responsible for the way that rice hardens on cooling. When rice cools to room temperature or beyond, the chains of amylose crystallize. This phenomenon is called retrogradation (related to proteins). The gel seems to be strengthened by proteins.

Amylose content is important because firmness and stickiness are two properties of cooked rice that influence consumer preference for, and use of different classes of rice.

Amylose content has traditionally been assessed by chemical analysis of the rice but technology has produced non-destructive methods using the NIR (Near infrared) spectroscopy and the visible regions of the spectrum. Recently, a microsatellite marker has been discovered in the flanking region of the GBSS (Granule-bound starch synthase-II) gene and the polymorphism relates to the amylose class and the market type. Fairly rapid throughput methods have been developed for analysis of the microsatellite in each rice line.

A modified Juliano, (1971) method was followed for estimating the amylose content of the selected pyramided lines. The procedure followed is described below.

A. Solution preparation

- **1N Sodium hydroxide (NaOH):** 40 g of anhydrous NaOH was dissolved in one liter of distilled water.
- **1N Acetic acid:** 57.75 ml of glacial acetic acid was dissolved in one litre of distilled water.
- **Iodine solution:** 2 g of Iodine and 20 g of potassium iodide (KI) (0.2% I₂ in 2% KI) dissolved in one liter water.
- **Standard amylose solution:** Take 40 mg of amylose then add 1 ml of absolute alcohol and 1N Sodium Hydroxide. Shake well and boil over water bath for 15 minutes and makeup the solution to 100 ml in a volumetric flask. Preparation of amylose standard curve was observed in Table 3.8.

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Table 3.8. Preparation of amylose standard curve in rice.

S.No.	Components	0 ml	1 ml	2 ml	3 ml	4 ml	5 ml
1	H ₂ O	6.0	4.8	3.6	2.4	1.2	0.0
2	Amylose Solution	0.0	1.0	2.0	3.0	4.0	5.0
3	1.0 N Acetic acid	0.0	0.2	0.4	0.6	0.8	1.0
4	I ₂ -KI reagent	2.0	2.0	2.0	2.0	2.0	2.0

(Source: *Rice Research in India*, ICAR Publication, 1985)

B. Procedure:

In a volumetric flask add 1ml of rectified spirit to 40 mg amylose. Then 9 ml of 1N NaOH was added, shaken well and boiled over water bath for 15 minutes. The solution was made up to 100 ml in a volumetric flask. Aliquot of 1 ml, 2 ml, 3 ml, 4 ml & 5 ml of the standard amylose was pipetted into volumetric flasks in three replications:

- 0.2 ml of acetic acid and 2ml Iodine + KI were added to 1 ml of standard amylose solution.
- 0.4 ml of acetic acid and 2 ml Iodine + KI were added to 2 ml of standard amylose solution.
- 0.6 ml of acetic acid and 2 ml Iodine + KI were added to 3 ml of standard amylose solution.
- 0.8 ml of acetic acid and 2 ml Iodine + KI were added to 4 ml of standard amylose solution.
- 1.0 ml of acetic acid and 2 ml Iodine + KI were added to 5 ml of standard amylose solution.

After adding Iodine/ KI, the solution was made up to 100 ml and the flasks were covered with a black cloth. After 20 minutes, the readings were taken in spectrophotometer at 620 nm.

C. Procedure for analysis of amylose content in rice

i. Sample preparation

To prepare standard rice samples, make sure that all samples to be used have been stored in the same room for at least 2 days to ensure equal moisture content. In choosing standard samples include a range of rice samples representing the low,

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intermediate and high amylose content. Grind 20 lots of each sample to a fine powder in a Wig-L Bug amalgamator or similar device for 40 seconds. A cyclone mill with 1 mm sieve may also be used for grinding.

ii. Analysis of amylose content (AC)

Take 100 mg rice flour in long test tube (2×19.5 cm), add 1 ml of rectified spirit and 9 ml of 1N NaOH. Shake thoroughly and heat the test tube on water bath for 15 minutes. Pour the sample after digestion in a volumetric flask (100 ml), rinsed twice with hot distilled water and later make up the sample to 100 ml.

Draw 5 ml solution in three replications into three 100 ml volumetric flasks. For each 5 ml solutions add 1 ml of acetic acid and 2 ml of I2-KI reagent and make it to 100 ml in a volumetric flask. Cover all flasks with black cloths as I2-KI loses colour when exposed to light. Adjust the spectrophotometer at 620 nm and all the readings were taken. Percentage of amylose content is calculated by multiplying the spectrophotometer readings and factor value obtained from standard.

3.5.4 Alkali Spreading Value (Gelatinization temperature)

Gelatinization temperature is the temperature at which the starch in rice begins the process of cooking. At this point the starch granules take in water and lose their crystalline nature, a change that is irreversible. Rice starch usually gelatinizes between 65°C and 85°C.

Rice with a gelatinization temperature at the lower end of the range often cooks to a softer texture and retrogrades less than rice with a gelatinization temperature at the upper end of the range. Gelatinization is often measured by the alkali spreading method. However technology has improved the measurement of this trait too. Differential scanning calorimetry gives the actual temperature of gelatinization and the energy required for the particular rice to pass through that transition. Whole milled grains were used to analyze gelatinization temperature (GT), which was estimated by the extent of alkali spreading value of the raw milled rice in a weak alkali solution, 1.7% KOH (Juliano *et al.*, 1990).

A. Solution preparation

Potassium Hydroxide (KOH): Dissolve 19.54 g of KOH pellets (85%) in 1000 ml of distilled water and store it at least for 24 hours and filter it before use.

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B. Procedure

Duplicate sets of six whole milled kernels without cracks were taken and kept in plastic boxes. Broken kernels were also used if whole grains are not available. To the sample, 10 ml of 1.7% Potassium Hydroxide was added. Enough space was provided between the kernels to allow spreading. The samples were kept undisturbed in an incubator at 27-30°C for 23 hours. A standard variety was used as a check and all samples were evaluated at least in two replications. The spreading, clearing scale and gelatinization temperature value of the kernels were noted on a 7 point scale and expressed as average of six values which was given below (Table 3.9 and 3.10).

Table 3.9. Alkali spreading value and clearing scale of rice.

S. No.	Spreading Scale	Clearing Scale
1	Kernel not affected	Kernel chalky
2	Kernel swollen	Kernel chalky, collar powdery
3	Kernel swollen, collar incomplete and narrow	Kernel chalky, collar cottony or cloudy
4	Kernel swollen, collar complete and wide	Centre cottony, collar cloudy
5	Kernel split or segmented, collar complete and wide	Centre cottony, collar clearing
6	Kernel dispersed, merging with collar	Centre cottony, collar, cleared
7	All kernel dispersed and inter mingled	Centre and collar cleared

(Source: Rice Research in India, ICAR Publication, 1985)

Table 3.10. Alkali spreading value and Gelatinization temperature of rice.

S.No.	Classification	Alkali spreading value (ASV)	Gelatinization temperature (GT)
1	1-2	Low	High > 74°C
2	3	Low, Intermediate	High, intermediate
3	4-5	Intermediate	Intermediate (70°C -74°C)
4	6-7	High	Low (55°C-69°C)

(Source: Rice Research in India, ICAR Publication, 1985)

3.5.5 Gel Consistency Test

Gel consistency test was conducted by following the procedure explained by Cagampang *et al.* (1973).

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A. Solution preparation:

- (1) 0.2N KOH: 2.8 g of KOH dissolved in 250 ml of distilled water.
- (2) Thymol blue: 0.025 g thymol blue dissolved in 100 ml of absolute alcohol.

B. Procedure for analysis of gel consistency in rice:

Make sure that all samples have been stored in the same room for at least 2 days so that the moisture content is equalized.

- 10 milled grains were placed in the motor and were ground to obtain fine flour (100 meshes). 100 mg of flour was taken in three culture tubes.
- About 0.2 ml of ethanol containing 0.25% thymol blue was added followed by 2 ml of 0.2N KOH. The solution was mixed on a cyclo mixer.
- The test tubes were kept in water bath at 90-100°C for 8 minutes after putting one glass marble on each test tube. After removing the culture tubes from water bath, the contents were cooled for 5 minutes. The solution was mixed on a cyclone mixer.
- The culture tube was kept in the low temperature bath at 0-2°C for 20 minutes. The culture tubes are removed from ice bath were laid horizontally for one hour over ruled or graph paper.

Length of the blue colored gel from the inside bottom of the test tube to the gel front was then measured as gel consistency of the sample (Table 3.11).

Table 3.11: Gel consistency of rice.

S.No.	Type of gel	Length of gel spread
1	Hard gel consistency	26-40 mm
2	Medium gel consistency	41-60 mm
3	Soft gel consistency	61-100 mm

(Source: *Rice Research in India, ICAR Publication, 1985*)

3.6 Phenotypic screening of pyramided lines for blast and BLB disease

The pyramided lines (BC₂F_{2.3}) which were carrying blast (digenic lines) and BLB genes were screened for phenotypic disease reaction. The detailed description of methods employed is described below.

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3.6.1 Phenotypic screening of pyramided lines for Blast disease

Tray Method and Uniform Blast nursery (UBN) method were used to screen pyramided lines for blast disease reaction.

3.6.1.1 Tray method : The trays measuring 50 cm × 30 cm × 7 cm (L×W×H) are used for blast disease screening. The soil is pretreated with FYM (Farm yard manure), recommended dosage of fertilizer. Then the plastic trays are filled with puddled soil up to 5 cm depth and seeds were sown. After 10-15 days of sowings, plants can be screened for the blast resistance by spraying the spore suspension of the pathogen (Plate 3.3).

3.6.1.2 Uniform Blast Nursery (UBN) method : Pyramided lines along with parents were evaluated for blast disease at Uniform Blast Nursery (UBN) facility, Department of Plant Pathology, Muzaffarnagar. The UBN facility is uniformly fertile with protection from direct sunlight and a good wind break. Detailed procedure of screening procedure adopted (Krishna *et al.*, 2020) is described below.

In the UBN each test entry was sown in a single row of 50 cm long and 10 cm apart. After every 20 test entries a local susceptible variety was planted. The test materials were surrounded by densely sown spreader rows of susceptible rice cultivar HR-12 (Figure 3.2). Polythene sheets and overhead water sprinklers were used to maintain sufficient humidity to spread the disease. At the fourth-leaf stage, the seedlings were sprayed with spores of *M. oryzae* about of 30-40 ml of the spore suspension (native IIRR isolate) of the blast pathogen collected from Muzaffarnagar (approximately 105 spores per ml mixed with Tween-20 @ 0.2%) was sprayed on 15 days old seedlings using a glass atomizer and high relative humidity (93-99%) was maintained throughout the growing period. The water was sprayed 3-4 times a day to maintain high humidity using over-head sprinklers. Inoculated seedlings were monitored for the development of blast lesions. The disease reaction on each line was recorded after 15 days of inoculation, following standard 0-9 scale (IRRI - SES, 1996) Table 3.12 and the complete process of screening is depicted in Plate 3.4.

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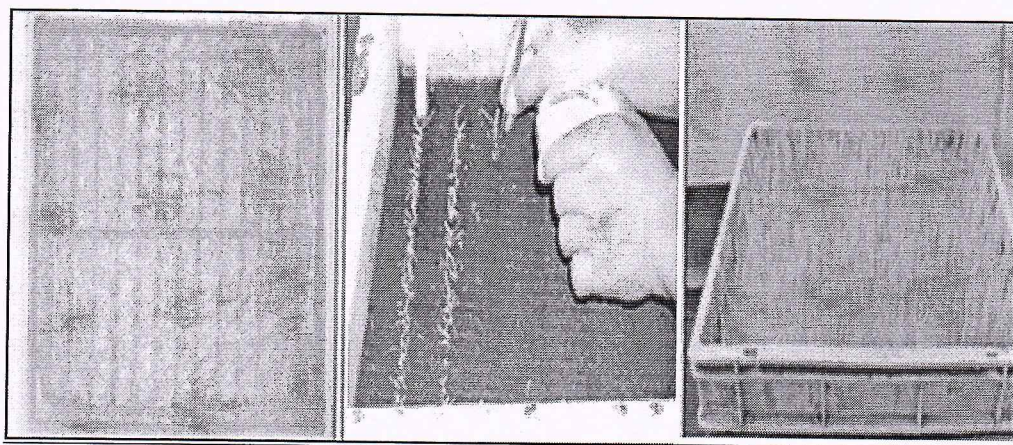


Plate 3.3. Screening of rice cultivars for resistance to blast using tray method.

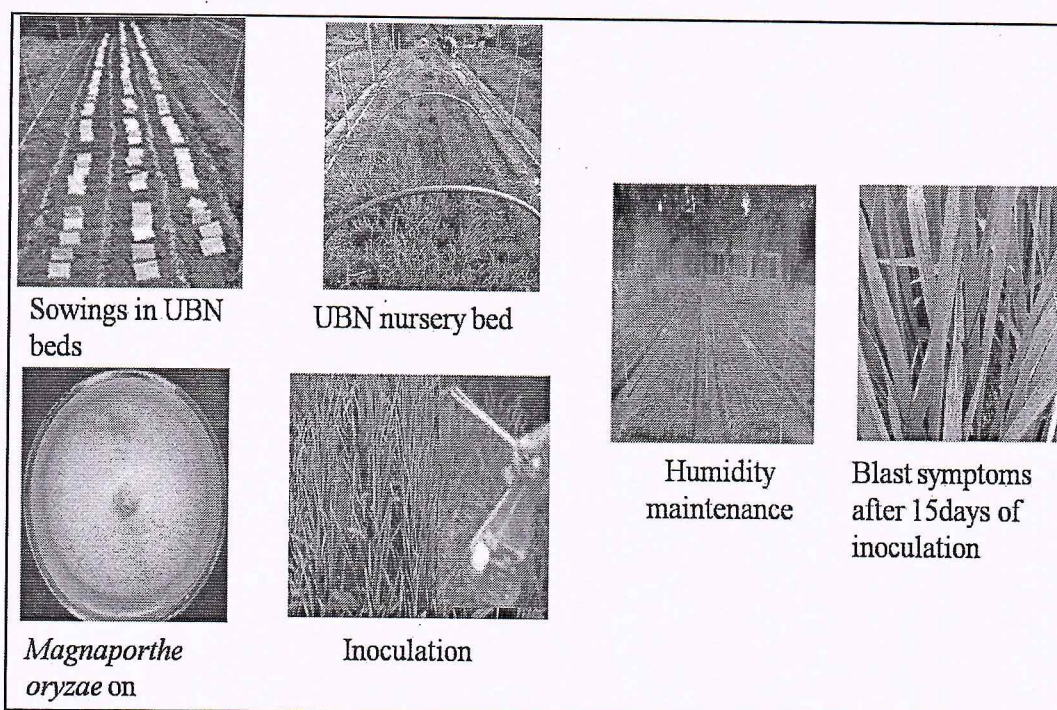


Plate 3.4. Screening for blast resistance in rice cultivars using Uniform Blast Nursery.

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Figure 3.2. Layout of uniform blast nursery for screening against leaf blast at seedling stage.

Length of nursery bed depends on land availability and topography of the area.

Table 3.12. Description of the SES scale for blast disease scoring of rice (IRRI, 1996).

Score	Description of Symptom	Reaction
0	No lesions	Highly Resistant (HR)
1	Small brown specks pinhead size without sporulating centre	Resistant (R)
2	Small roundish to slightly elongated necrotic grey spots, about 1-2mm in diameter with a distinct brown margin, lesions are mostly found on the lower leaves	Resistant (R)
3	Lesion type is same as in scale 2, but a significant number of lesions are on the upper leaves	Moderately Resistant (MR)
4	Typical sporulating blast lesions, 3 mm or longer infecting less than 2% of the leaf area	Moderately Resistant (MR)
5	Typical blast lesions infecting 2-10% of the leaf area	Moderately Susceptible (MS)
6	Blast lesions infecting 11-25% of the leaf area	Moderately Susceptible (MS)
7	Blast lesions infecting 26-50% of the leaf area	Susceptible (S)
8	Blast lesions infecting 51-75% of the leaf area	Susceptible (S)
9	More than 75% leaf area affected	Highly Susceptible (HS)

3.6.2 Phenotypic screening of pyramided lines for bacterial leaf blight disease

The blast resistant lines were transplanted (30 days old seedlings) to puddled rice field to assess their resistance against bacterial leaf blight. Mixed virulent IX0

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isolates (collected from Telangana) of *Xanthomonas oryzae* pv. *oryzae* (Xoo) were used for screening. The bacterial culture of the pathogen was maintained on Hayward's agar media at 28°C for 96 hours, harvested after incubation period and diluted to get a final concentration of 10^8 cfu/ml. Inoculation was done at maximum tillering stage following leaf clip method of Kauffman *et al.* (1973) by clipping the leaf tip (about 1-2 cm) of the uppermost leaf with scissors dipped in inoculum (Plate 3.5). Symptoms were measured at 15 days after inoculation based on the IRRI-SES (Plare IRRI, 1998) developed for assessing diseased leaf area, mean percentage of diseased leaf area (% of DLA) on the upper three leaves of plant. BLB resistant plants were confirmed for the presence of target BLB resistance genes through genotyping. Detailed procedure of screening procedure adopted (Kauffman *et al.*, 1973) is described below.

The lesion length and total leaf length were recorded on 5 leaves and were further categorized based on 0-9 score which is as follows: 0=No visible lesion, 1=lesion restricted to 0.5 to 1.0 mm. 3=lesion elongated but less than $\frac{1}{4}$ of leaf blade, 5=lesion extended to $\frac{1}{2}$ of leaf blade 7=lesion elongated more than $\frac{1}{2}$ of leaf blade and 9=lesion completely destroyed the leaf blade and sheath. The disease score were rated as HR, R, MR, MS, S and HS (Table 3.13).

Table 3.13. BLB Disease scoring and their reactions in rice (SES, IRRI, 1998).

Score	% of infected leaf area	Description	Reaction
0	0	No visible lesion	Highly Resistant (HR)
1	1-5%	lesion restricted to 0.5 to 1.0 mm	Resistant (R)
3	6-12%	lesion elongated but less than $\frac{1}{4}$ of leaf blade	Moderately Resistant (MR)
5	13-25%	lesion extended to $\frac{1}{2}$ of leaf blade	Moderately Susceptible (MS)
7	26-50%	lesion elongated more than $\frac{1}{2}$ of leaf blade	Susceptible (S)
9	75%	lesion completely	Highly Susceptible

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		destroyed the leaf blade and sheath	(HS)
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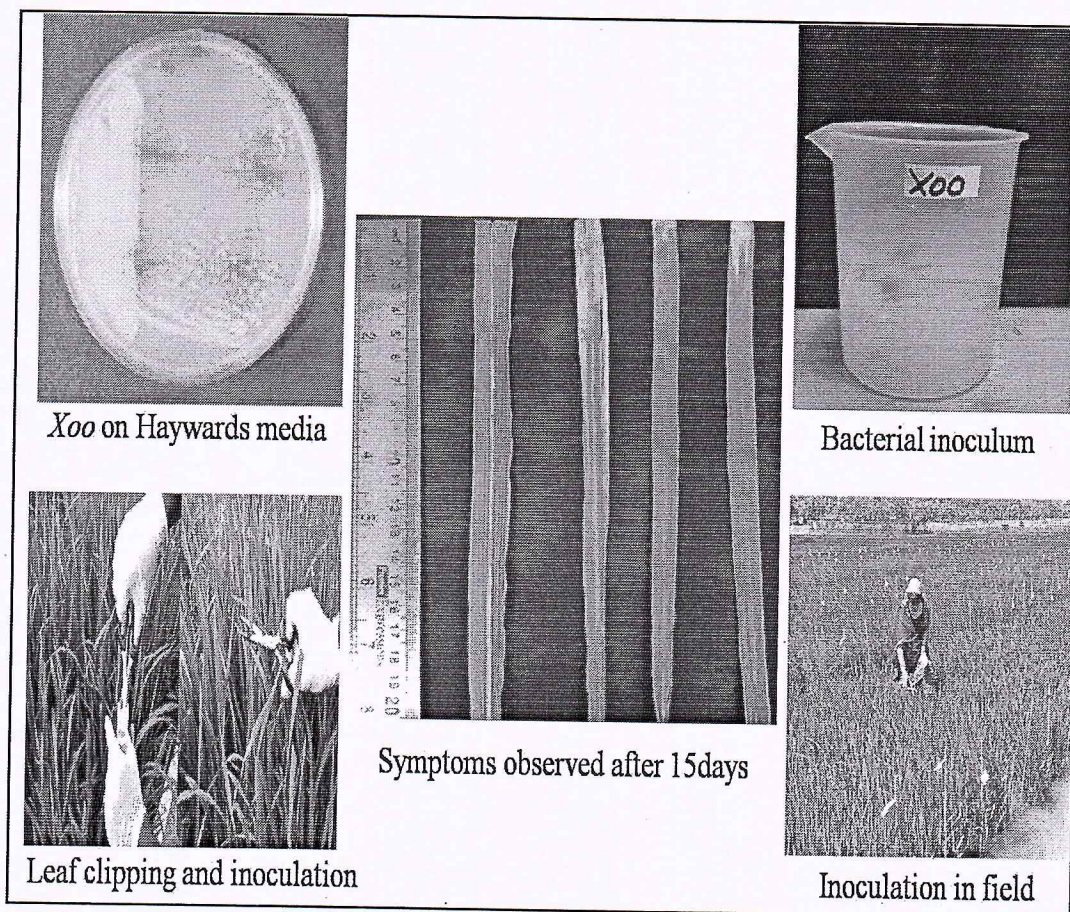


Plate 3.5. Schematic representation of steps involved in BLB inoculation. Inoculum preparation from *Xoo* culture; Leaf clipping using Kauffman *et al.* (1973) method and observation of symptoms after 15 days.

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Results and Discussion

Rice (*Oryza sativa* L.) is a staple dietary food source for significant part of the world's population. Globally, 730 million tonnes of rice is produced from 163 million hectares of land. Self-sufficiency sustenance and to meet food grain requirement of the ever-increasing population demand, an extra 27% of rice needs to be produced by the next 5 years with same or diminishing arable land, water and other resources. Hence, enhancing yield is the only possible alternative to match the food scarcity. Post green revolution has witnessed increased rice yields owing to development and deployment of high yielding, semi-dwarf, input responsive, photo-insensitive varieties for cultivation. However, at present yield levels of elite cultivars is stagnant due to influence of several biotic and abiotic factors. Among the biotic stresses, blast and bacterial leaf blight are the most destructive diseases, causing significant reduction in grain yield and quality.

Hence, improvement of popular high yielding rice varieties with disease resistance is a priority to sustain the rice production. Resistance governed by single gene can break down after few years due to the dynamic nature of the pathogen. But, the probability of new races to overcome the resistance conferred by a multiple genes in the pyramided line happens to be extremely low. Therefore, developing resistant varieties by pyramiding multiple resistance genes into susceptible cultivars to confer broad-spectrum resistance is considered to be an efficient and economical approach for crop improvement.

Pyramiding of resistance genes using conventional breeding procedure is time consuming and is generally affected by linkage drag due to which undesired traits also get transferred. On the other hand, MAS using molecular markers closely linked to the desired trait reduces the selection time. Thus, MAS combined with conventional breeding together facilitate combining (or pyramiding) *R* genes in elite rice varieties to improve the resistance and durability.

In view of the importance of durable resistance to blast and bacterial leaf blight breeding in rice, the present investigation entitled "Development of digenic lines having resistance to blast and bacterial leaf blight through marker assisted selection in Rice (*Oryza sativa* L.)" was carried out during *kharif* 2017 to *kharif* 2020

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to introgress major blast resistance genes (*Pi9*, *Pi20*, *Pi40* and *Pita*) into the genetic background of Improved Samba Mahsuri. Four independent crosses were attempted and marker-assisted backcross strategy was utilized to enhance blast resistance in combination with the bacterial leaf blight resistance (*Xa21*, *xa13* and *xa5*). The major findings of the study are presented below.

The parental lines of the present study, the genotype ISM-ML^{Pi54} (recurrent parent) and four genotypes viz., ISM-ML^{Pi9}, ISM-ML^{Pi20}, ISM-ML^{Pi40} and ISM-ML^{Pita} (donor parents) showed polymorphism for all targeted resistance genes with respective genes-specific/linked markers viz., Pikh-MAS for *Pi54*, NMSM-*Pi9* for *Pi9*, RM1337 for *Pi20*, MSM-6 for *Pi40* and RM5364 for *Pita*. The results confirmed that, the parental lines are monogenic for blast resistance genes. The gene specific/linked markers were employed for foreground selection for both blast and BLB resistance during the introgression programme. Parental polymorphism survey using 1800 genome-wide uniformly distributed simple sequence repeats markers, identified 104 polymorphic markers among the five parental lines used in this study. A total of four cross combinations were effected with an aim to develop digenic lines carrying blast genes combinations of *Pi54+Pi9*, *Pi54+Pi20*, *Pi54+Pi40* and *Pi54+Pita* using marker assisted backcross breeding strategy.

In the Cross-I (ISM-ML^{Pi54}/ISM-ML^{Pi9}), a total of **five** BC₂F₂ plants (ISM-DL^{Pi54+Pi9}-9-9-32-4, ISM-DL^{Pi54+Pi9}-9-9-32-7, ISM-DL^{Pi54+Pi9}-9-9-42-3, ISM-DL^{Pi54+Pi9}-9-9-42-18 and ISM-DL^{Pi54+Pi9}-9-9-42-23) were identified as digenic plants having genes combination ***Pi9* and *Pi54*** in homozygous condition. Similarly, a total of **nine** BC₂F₂ plants identified as digenic plants (ISM-DL^{Pi54+Pi20}-20-5-65-2, ISM-DL^{Pi54+Pi20}-20-5-65-11, ISM-DL^{Pi54+Pi20}-20-5-65-15, ISM-DL^{Pi54+Pi20}-20-5-66-2, ISM-DL^{Pi54+Pi20}-20-5-66-11, ISM-DL^{Pi54+Pi20}-20-5-66-12, ISM-DL^{Pi54+Pi20}-20-5-66-16, ISM-DL^{Pi54+Pi20}-20-5-69-9 and ISM-DL^{Pi54+Pi20}-20-5-69-15) in Cross-II (ISM-ML^{Pi54}/ISM-ML^{Pi20}) having ***Pi20* and *Pi54***. While in Cross-III (ISM-ML^{Pi54}/ISM-ML^{Pi40}) **seven** plants (ISM-DL^{Pi54+Pi40}-40-3-120-2, ISM-DL^{Pi54+Pi40}-40-3-120-10, ISM-DL^{Pi54+Pi40}-40-3-120-12, ISM-DL^{Pi54+Pi40}-40-3-120-16, ISM-DL^{Pi54+Pi40}-40-4-122-5, ISM-DL^{Pi54+Pi40}-40-4-122-9 and ISM-DL^{Pi54+Pi40}-40-4-122-13) were having ***Pi40* and *Pi54***. Similarly, in Cross-IV (ISM-ML^{Pi54}/ISM-ML^{Pita}), **six** plants (ISM-DL^{Pi54+Pita}-ta-9-256-2, ISM-DL^{Pi54+Pita}-ta-9-256-16, ISM-DL^{Pi54+Pita}-ta-10-270-12, ISM-DL^{Pi54+Pita}-ta-10-270-15, ISM-DL^{Pi54+Pita}-ta-10-272-14 and ISM-DL^{Pi54+Pita}-ta-

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11-273-9) having *Pita* and *Pi54* were identified as digenic plants respectively. In total, 27 digenic blast resistant lines carrying four different gene combinations were developed.

The digenic blast pyramided lines with bacterial blight genes (*Xa21*, *xa13* and *xa5*) were identified by using marker assisted backcrossing strategy in four independent crosses. In the **Cross-I** (ISM-ML^{Pi54}/ISM-ML^{Pi9}), **three** BC₂F₂ plants (ISM-PYL^{Pi54+Pi9}-9-9-32-1, ISM-PYL^{Pi54+Pi9}-9-9-42-6 and ISM-PYL^{Pi54+Pi9}-9-9-42-9) homozygous for 5 genes (*Pi54+Pi9+Xa21+xa13+xa5*) were identified. Among these, ISM-PYL^{Pi54+Pi9}-9-9-42-9 had maximum RPGR of ~96.8%. In **Cross-II** (ISM-ML^{Pi54}/ISM-ML^{Pi20}), **eight** true BC₂F₂ plants (ISM-PYL^{Pi54+Pi20}-20-5-65-4, ISM-PYL^{Pi54+Pi20}-20-5-66-8, ISM-PYL^{Pi54+Pi20}-20-5-66-10, ISM-PYL^{Pi54+Pi20}-20-5-69-1, ISM-PYL^{Pi54+Pi20}-20-5-69-2, ISM-PYL^{Pi54+Pi20}-20-5-69-7, ISM-PYL^{Pi54+Pi20}-20-5-69-13 and ISM-PYL^{Pi54+Pi20}-20-5-69-14) were identified as homozygous for all five genes (2 blast genes, *Pi54* and *Pi20* & 3 BLB genes, *Xa21*, *xa13* and *xa5*). Among these, ISM-PYL^{Pi54+Pi20}-20-5-66-8 showed the highest (96.5%) RPGR. In case of **Cross-III**, **four** BC₂F₂ plants (ISM-PYL^{Pi54+Pi40}-40-3-120-7, ISM-PYL^{Pi54+Pi40}-40-3-122-4, ISM-PYL^{Pi54+Pi40}-40-3-122-6 and ISM-PYL^{Pi54+Pi40}-40-4-122-16) were identified as homozygous for all 5 target genes (*Pi54* and *Pi40* & *Xa21*, *xa13* and *xa5*). Among them, ISM-PYL^{Pi54+Pi40}-40-4-122-16 showed the highest (96.4%) RPGR. Similarly, **five** BC₂F₂ plants (ISM-PYL^{Pi54+Pita}-ta-9-256-8, ISM-PYL^{Pi54+Pita}-ta-9-270-2, ISM-PYL^{Pi54+Pita}-ta-11-270-3, ISM-PYL^{Pi54+Pita}-ta-10-272-2 and ISM-PYL^{Pi54+Pita}-ta-11-273-4) were identified as homozygous for all 5 genes in **Cross-IV** wherein, ISM-PYL^{Pi54+Pita}-ta-10-272-2 showed 95% of RPGR.

The pyramided lines (two blast + three BLB genes) obtained from four independent crosses along with parents were evaluated for key agro-morphological traits viz., days to 50% flowering, plant height, number of productive tillers per plant, panicle length, panicle weight, number of filled grains per panicle, spikelet fertility, 1000 grain weight, grain yield per plant and grain type. Grain yield range was from 25-37.9 g plant⁻¹ among pyramided lines as compared to 36.20±0.2 g plant⁻¹ of recurrent parent, ISM-ML^{Pi54} indicating no yield penalty or negative impact of agromorphological traits in the pyramided lines. The pyramided lines, ISM-PYL^{Pi54+Pi9}-9-9-42-9 (37.7 g plant⁻¹), ISM-PYL^{Pi54+Pi20}-20-5-66-8 (36.8 g plant⁻¹), ISM-PYL^{Pi54+Pi40}-40-4-122-16 (36.9 g plant⁻¹) and ISM-PYL^{Pi54+Pita}-ta-10-272-2 (37.9 g

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plant⁻¹) were identified as the best from four crosses and out yielded the recurrent parent, because of their more number of productive tillers per plant, high spikelet fertility, larger panicle length and higher thousand grain weight. Similarly, pyramided lines were also evaluated for grain and cooking quality traits viz., hulling, milling, Head rice recovery, KLBC, KBBC, L/B ratio, KLAC, KBAC, KER, amylose, protein content, GC and ASV content indicated that the pyramided lines developed from this study were similar to the previously released variety Improved Samba Mahsuri.

Pyramided lines obtained from four crosses were phenotyped against blast (UBN screening) and bacterial leaf blight disease resistance (leaf tip cut method) at seedling stage and maximum tillering stage respectively. All the 20 pyramided lines from four independent crosses were found to be resistant to the blast (score 0-2). The pyramided lines, ISM-PYL^{Pi54+Pi40} (Cross III) gene combinations showed very high levels of blast disease resistance (score 0) without yield penalty and these lines were selected as best lines.

In the present study, BC₂F_{2.3} plants of 27 digenic lines carrying four different combinations of blast genes were developed. Similarly, a total of 20 pyramided lines resistant to both blast and bacterial leaf blight diseases with medium slender grain type, good agro-morphological features, grain and cooking quality similar or superior to ISM-ML^{Pi54} were developed. These improved versions of the elite rice variety, could be of great use to farmers, especially those in areas prone to both blast and bacterial leaf blight by reducing the application of fungicides usage in ISM (Improved Samba Mahsuri) cultivation and thus alleviate the problem of fungicide residue in the grain, which is a concern in the domestic as well as global markets. Further, these pyramided lines could also be used as promising donors to transfer the blast and BLB resistant genes into other high yielding fine-grain type varieties and may be utilized for direct release after further testing and evaluation.


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Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar

Chairman
IQAC, Shri Ram College,
Muzaffarnagar

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Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar

Chairman
IQAC, Shri Ram College,
Muzaffarnagar



Shri Ram College

Approved by UGC, NCTE and Affiliated to MS University, Saharanpur
Muzaffarnagar - 251001, NCR (U.P.)

A++ Grade Accredited by NAAC

Date: 15 Sep 23

To,
Mr Nishank Jain
Adarsh Garment
Muzaffarnagar

Subject: Proposal for Sponsorship for Fashion Splash Collection

Dear Sir,

We are pleased to announce that Shri Ram College is hosting its annual Fashion Splash 23 (Fashion Show) on **November 24th, 25th, and 26th, 2023**, at our **Sports Ground**. This event serves as a platform for our talented students to showcase their creativity, innovation, and passion for fashion.

To make this event a grand success, we are seeking sponsorship for the students' fashion show collection. We believe that partnering with **Mr Nishank Jain (Adarsh Garment)**, renowned for its commitment to quality and elegance aligns perfectly with the vision of our event.

Key Highlights of the Event:

- **Dates:** November 24, 25, and 26, 2023
- **Venue:** Shri Ram College Sports Ground
- **Audience:** Over 60 including students, faculty, alumni, and invited dignitaries.
- **Collection:** Approx 600 Costume made by students
- **Media Coverage:** The event will receive coverage in local and regional media, offering significant brand visibility for your organization.
- **Footfalls:** 3000 each day Approx
- **Nation & International Model:** 8 International Female Models & 10 National Models Female and 10 National.

Benefits for Adarsh Garment:

1. Exclusive branding opportunities throughout the event.
2. Acknowledgment in all promotional materials, including banners, flyers, and social media posts.
3. Opportunity to distribute promotional materials or samples to the audience.
4. Recognition during the event announcements.


Co-ordinator
Shri Ram College
Muzaffarnagar


Chairman
IQAC, Shri Ram College,
Muzaffarnagar

We would be honored to collaborate with Mr Nishank Jain (Adarsh Garment) and would be delighted to discuss the sponsorship details further. Enclosed with this letter is a detailed sponsorship proposal for your reference.

We hope you share our enthusiasm for this exciting event and look forward to your positive response. Should you have any questions or require additional information, please feel free to contact us at **fdmana@gmail.com** or **8272002220**.

Thank you for considering our request. We look forward to the possibility of a mutually beneficial partnership.

Warm Regards,



Dr Manoj Dhiman
Director, Fine Arts
Shri Ram College, Muzaffarnagar



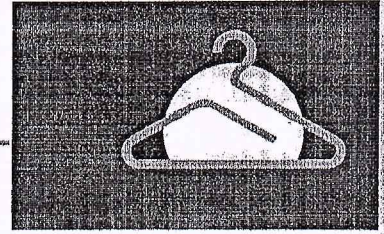
Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar



Chairman
IQAC, Shri Ram College,
Muzaffarnagar

Adarsh Garment

Muzaffarnagar



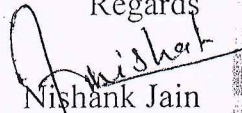
Date: 18th Oct'23

To
The Director
Faculty of Fine Arts
Shri Ram College, Muzaffarnagar

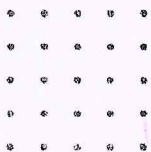
Dear Dr. Manoj Dhiman

We are pleased to grant grant-in-aid of Rs. 30000/- for the purchase of fabrics for the fashion show collection of the students of the Faculty of Fine Arts.

Regards


Nishank Jain

Adarsh Garments
Bhagat Singh Road
Mauzaffarnagar





Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar


Chairman
IQAC, Shri Ram College,
Muzaffarnagar

Bhagat Singh Road, Muzaffar Nagar City, Muzaffarnagar - 251002 (Near Peer)



**Shri Ram College, Muzaffarnagar
(Faculty of Fine Arts)**

Date: 20 Nov 23

To,
**Adarsh Garment, Bhagat Singh Road
Muzaffarnagar.**

Subject: Heartfelt gratitude for supporting our students with **₹30,000** for designer collection of fabrics.

Dear Adarsh Garment

On behalf of Dr Manoj Dhiman, Dir- Fine Art, I extend our heartfelt thanks for your generous contribution towards our heartfelt gratitude for supporting our students with Rs. **₹30,000** for designer collection of fabrics. Your support has been instrumental in empowering our talented student to bring their creative vision to life.

Your sponsorship not only facilitated the realization of this collection but also motivated students to strive for excellence. It is partnerships like yours that enable aspiring designers to achieve their dreams and set a foundation for their future success.

We deeply appreciate your commitment to nurturing creativity and supporting emerging talent. Please feel free to visit Fashion Splash 2023 to witness the results of your invaluable support.

Thank you once again for your generosity and belief in our mission. We look forward to staying connected and collaborating in future endeavors.

Warm Thanks & Regards,

Dr Manoj Dhiman
Director- Fine Arts
Shri Ram College, Mzn

Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar

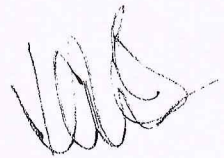
Chairman
IQAC, Shri Ram College
Muzaffarnagar

Fashion Splash 2023, a vibrant fashion show, received generous sponsorship contributions for its **Student Fashion Show Collection** segment. The sponsor amounts were as follows:

The students who receive this amount as assistants are as follows:

₹30,000 (Adarsh Garment, Muzaffarnagar)

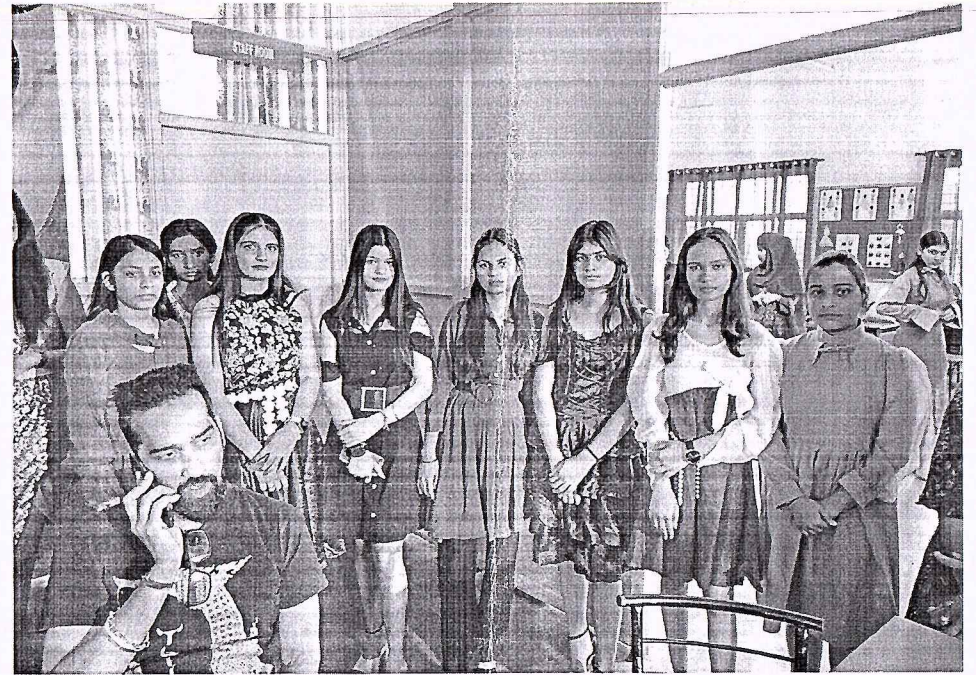
- 1- Chhoti
- 2- Aradhya Agarwal
- 3- Namra
- 4- Rekha
- 5- Sakshi malik
- 6- Shalu
- 7- Vaishali
- 8- Shivani
- 9- Rohan
- 10- Shahana
- 11- Krishna
- 12- Atul
- 13- Abhikit

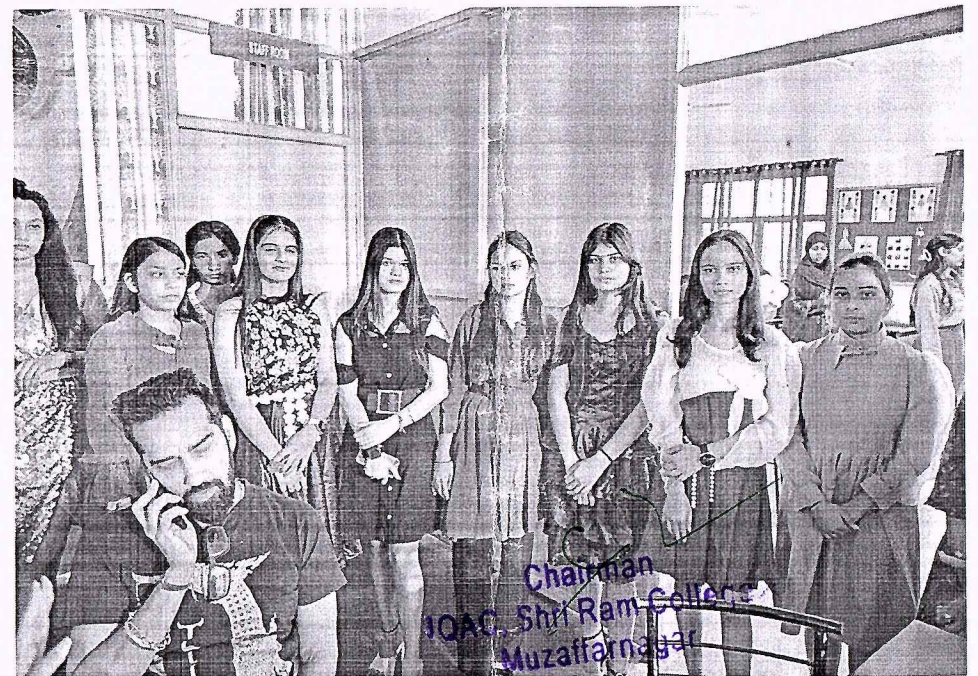
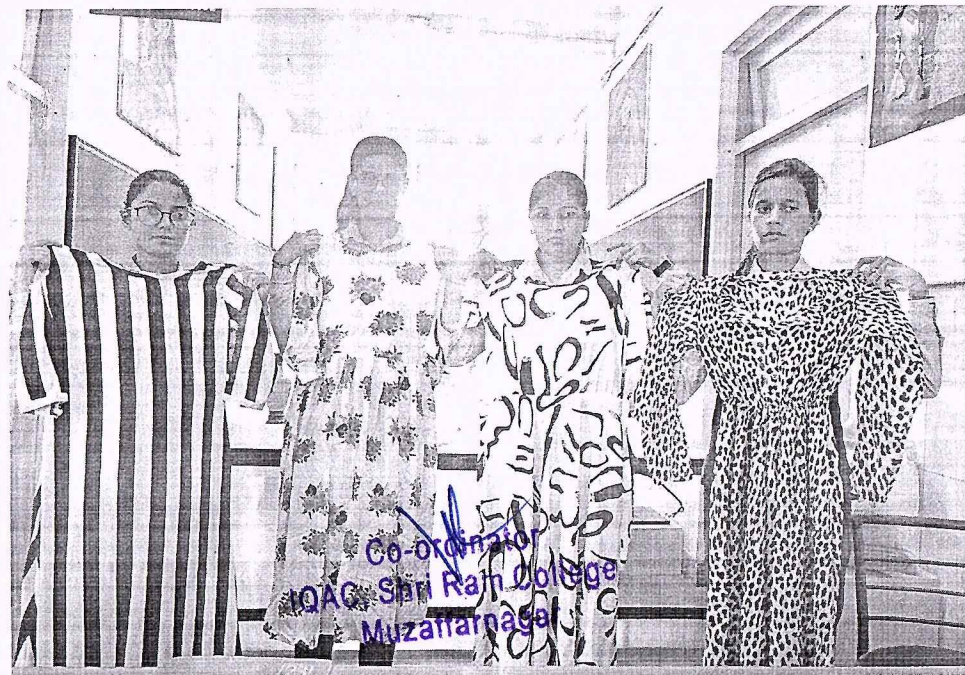


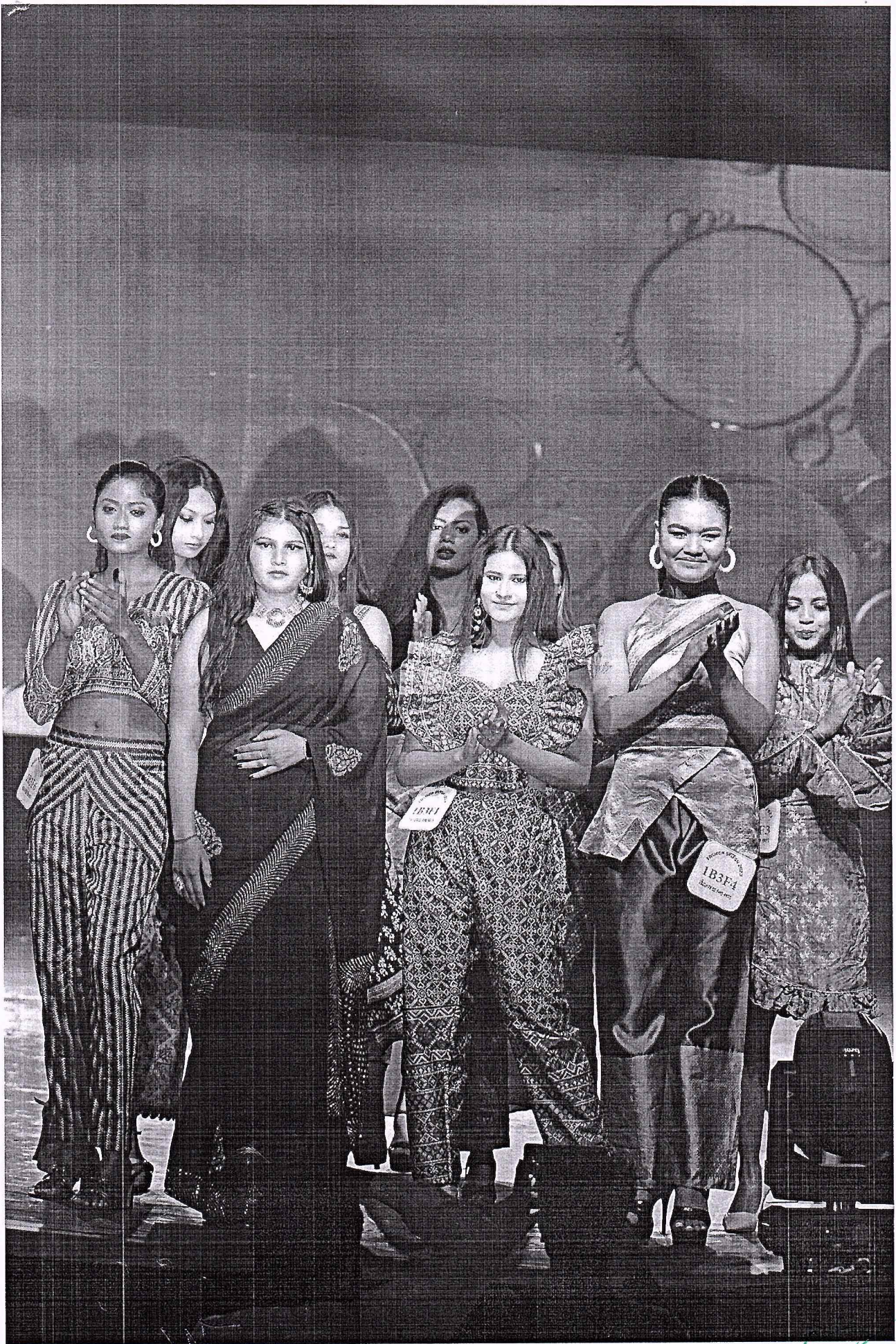
Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar



Chairman
IQAC, Shri Ram College,
Muzaffarnagar

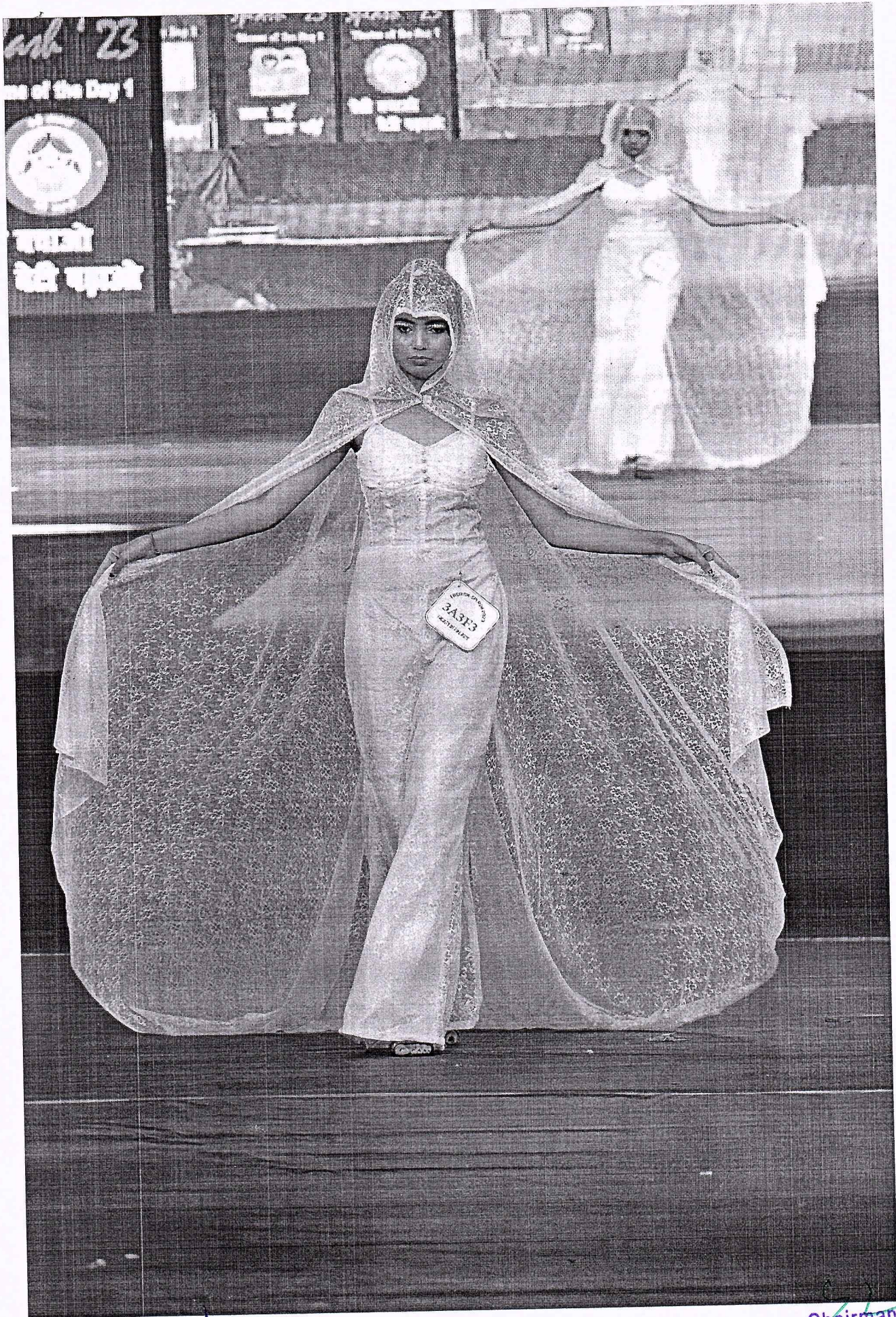






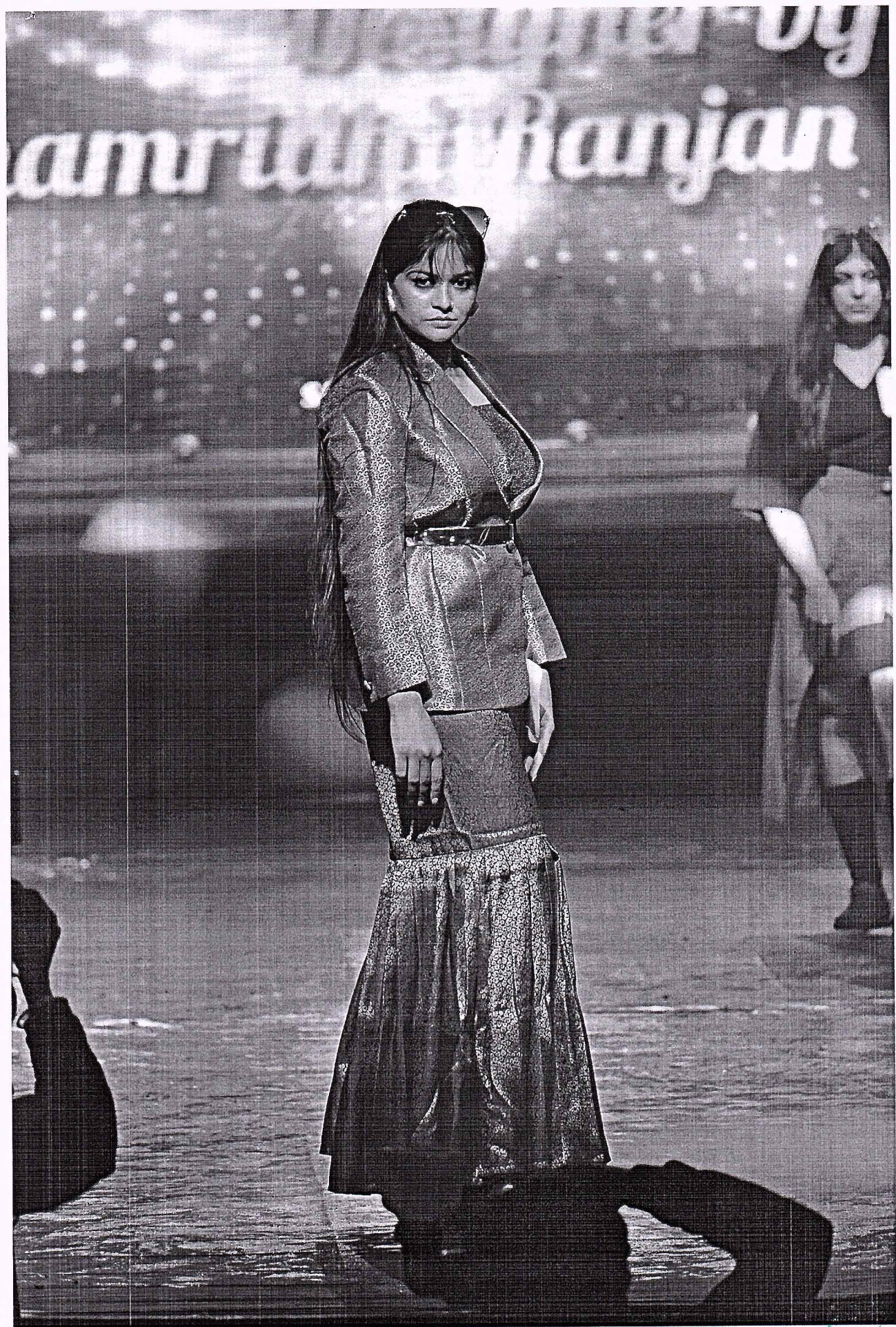
Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar

Chairman
IQAC, Shri Ram College
Muzaffarnagar



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Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar

Chairman
IQAC, Shri Ram College,
Muzaffarnagar




Co-ordinator
IQAC, Shri Ram College


Chairman
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Muzaffarnagar




Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar


Chairman
IQAC, Shri Ram College,
Muzaffarnagar


Chairman
IQAC, Shri Ram College,
Muzaffarnagar



[Signature]
Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar

[Signature]
Chairman
IQAC, Shri Ram College,
Muzaffarnagar

Faculty of Fine Arts
Shri Ram Group of Colleges

Presents

Fashion
Splash '23

Theme of the Day 1



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वर्ण

Faculty of Fine Arts
Shri Ram Group of Colleges

Presents

Fashion
Splash '23

Theme of the Day 2



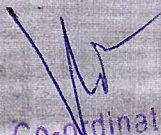
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वर्ण



Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar

Chairman
IQAC, Shri Ram College,
Muzaffarnagar




Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar


Chairman
IQAC, Shri Ram College,
Muzaffarnagar



Shri Ram College

Approved by UGC, NCTE and Affiliated to MS University, Saharanpur
Muzaffarnagar - 251001, NCR (U.P.)

A++ Grade Accredited by NAAC

Date: 15 Sep 23

To,

The Proprietor

Lavanya Exclusive & Uniform

Gandhi Colony, Muzaffarnagar

Subject: Proposal for Sponsorship for Fashion Splash Collection

Dear Madam,

We are pleased to announce that Shri Ram College is hosting its annual Fashion Splash 23 (Fashion Show) on **November 24th, 25th, and 26th, 2023**, at our **Sports Ground**. This event serves as a platform for our talented students to showcase their creativity, innovation, and passion for fashion.

To make this event a grand success, we are seeking sponsorship for the students' fashion show collection. We believe that partnering with **Lavanya Exclusive & Uniform**, renowned for its commitment to quality and elegance aligns perfectly with the vision of our event.

Key Highlights of the Event:

- **Dates:** November 24, 25, and 26, 2023
- **Venue:** Shri Ram College Sports Ground
- **Audience:** Over 60 including students, faculty, alumni, and invited dignitaries.
- **Collection:** Approx 600 Costume made by students
- **Media Coverage:** The event will receive coverage in local and regional media, offering significant brand visibility for your organization.
- **Footfalls:** 3000 each day Approx
- **Nation & International Model:** 8 International Female Models & 10 National Models Female and 10 National.

Benefits for Lavanya Exclusive & Uniform:

1. Exclusive branding opportunities throughout the event.
2. Acknowledgment in all promotional materials, including banners, flyers, and social media posts.
3. Opportunity to distribute promotional materials or samples to the audience.
4. Recognition during the event announcements.


Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar


Chairman
IQAC, Shri Ram College,
Muzaffarnagar

Contact @ 9927028908, 9927011422

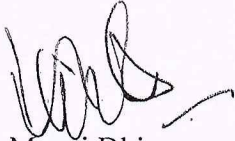
Website : www.srgcmzn.com E-Mail : src_mzn@rediffmail.com

We would be honored to collaborate with Lavanya Exclusive & Uniform and would be delighted to discuss the sponsorship details further. Enclosed with this letter is a detailed sponsorship proposal for your reference.

We hope you share our enthusiasm for this exciting event and look forward to your positive response. Should you have any questions or require additional information, please feel free to contact us at fdmana@gmail.com or 8272002220.

Thank you for considering our request. We look forward to the possibility of a mutually beneficial partnership.

Warm Regards,



Dr Manoj Dhiman
Director, Fine Arts
Shri Ram College, Muzaffarnagar



Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar



Chairman
IQAC, Shri Ram College,
Muzaffarnagar

Lavanya's

Exclusive & Uniform

GSTIN: 09ABJPA33G12X

Ref No.

Date: 27-10-2023

To
The Director
Faculty of Fine Arts
Shri Ram College,
Muzaffarnagar

Sub: Acceptance of donation for Students' Fashion Show Collection fabric

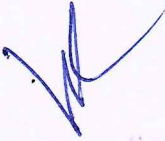
Respected Sir,

We are pleased to grant-in-aid of Rs. 32,500/- for the purchase of fabrics for the fashion show collection of the students of the Faculty of Fine Arts.

This grant will greatly help in providing practical experience to the students, enabling them to bring their innovative designs to life. Lavanya Boutique is committed to providing high quality fabrics that meet the requirements of the collection and enhance the overall presentation of the show.

We look forward to continuing this fruitful collaboration in the future as well.

Regards,


Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar


Lavanya Boutique
Muzaffarnagar
Chairman
IQAC, Shri Ram College,
Muzaffarnagar

411-A, Lane No.9, Gandhi Colony, Muzaffarnagar

9897946303

Sunday Closed



**Shri Ram College, Muzaffarnagar
(Faculty of Fine Arts)**

Date: 20 Nov 23

To,
Lavanya Exclusive & Uniform
Muzaffarnagar

Subject: Heartfelt gratitude for supporting our students with ₹32,500 for designer collection of fabrics.

Dear Lavanya Exclusive & Uniform

On behalf of Dr Manoj Dhiman, Dir- Fine Art, I extend our heartfelt thanks for your generous contribution towards our heartfelt gratitude for supporting our students with Rs. ₹32,500 for designer collection of fabrics. Your support has been instrumental in empowering our talented student to bring their creative vision to life.

Your sponsorship not only facilitated the realization of this collection but also motivated students to strive for excellence. It is partnerships like yours that enable aspiring designers to achieve their dreams and set a foundation for their future success.

We deeply appreciate your commitment to nurturing creativity and supporting emerging talent. Please feel free to visit Fashion Splash 2023 to witness the results of your invaluable support.

Thank you once again for your generosity and belief in our mission. We look forward to staying connected and collaborating in future endeavors.


Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar

Warm Thanks & Regards,


Dr Manoj Dhiman
Director- Fine Arts
Shri Ram College, Mzn


Chairman
IQAC, Shri Ram College;
Muzaffarnagar

Fashion Splash 2023 (A Fashion Week) (International Fashion Show)
Organized By
Faculty of Fine Arts

Fashion Splash 2023, a vibrant fashion show, received generous sponsorship contributions for its **Student Fashion Show Collection** segment. The sponsor amounts were as follows:

The students who receive this amount as assistants are as follows:

₹32,500 (Lavanya Exclusive & Uniform)

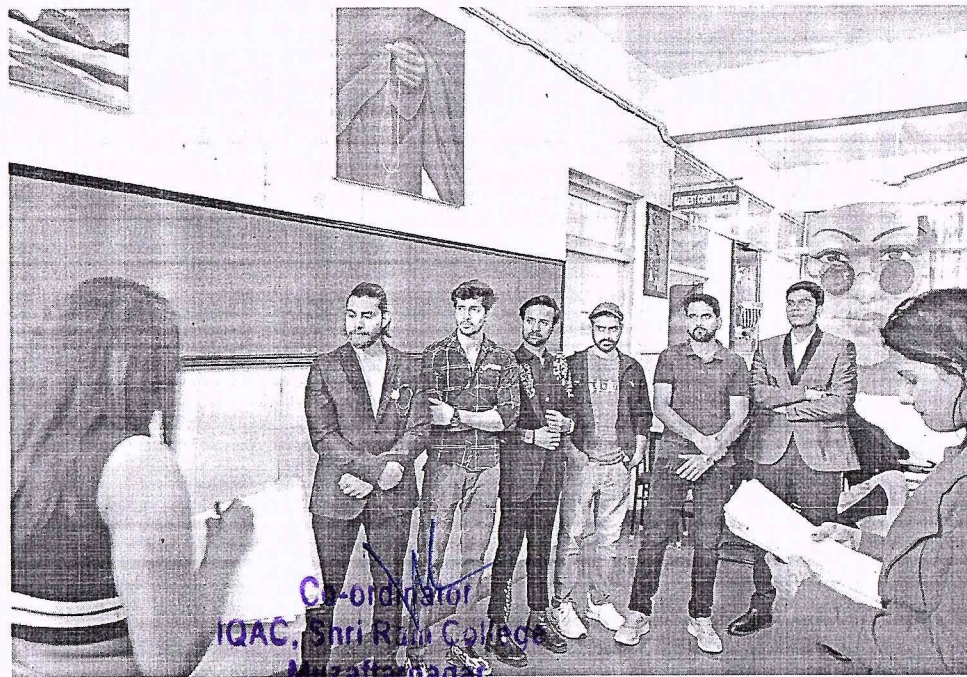
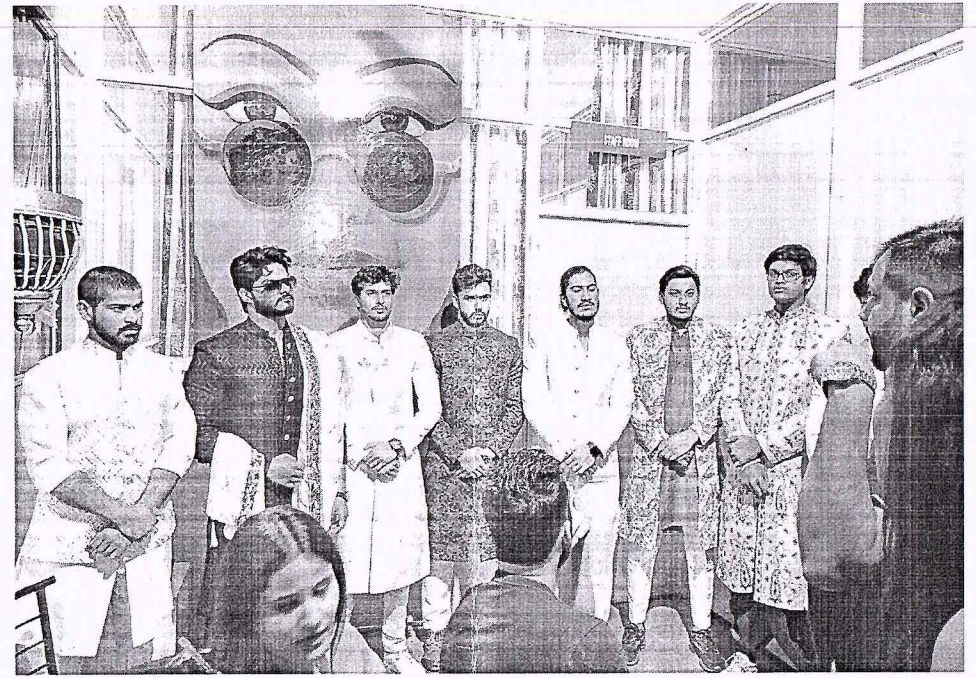
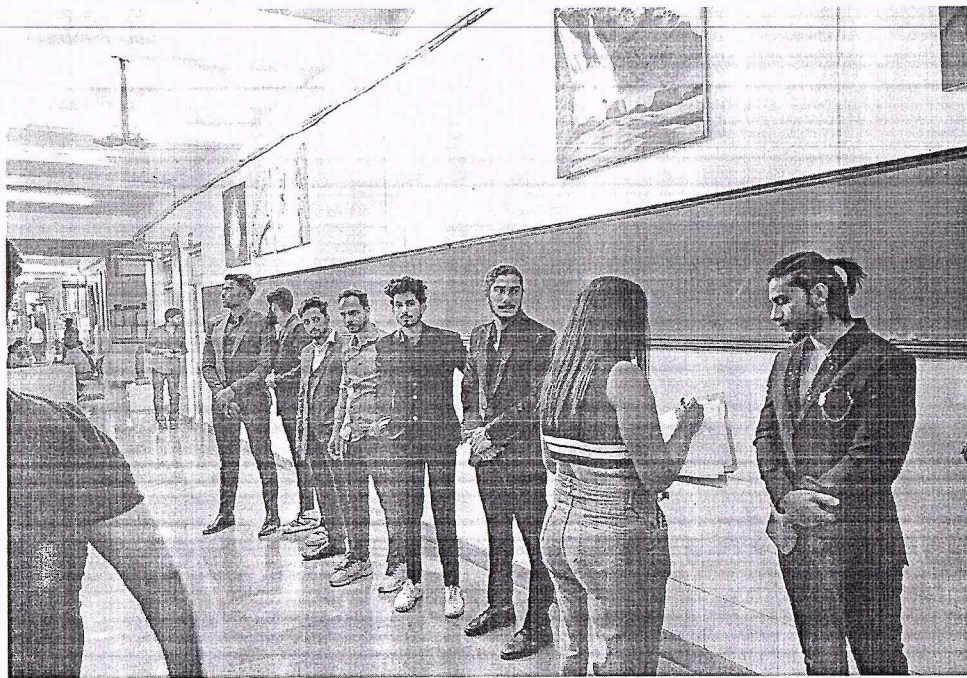
- 1- Parkhi
- 2- Bhawana Sharma
- 3- Natasha Pundir
- 4- Priyanshu Deshwal
- 5- Shagun Baliya
- 6- Naina
- 7- Aprova
- 8- Deepa
- 9- Vaishali
- 10- Khushi Sharma
- 11- Dananjay
- 12- Parchi



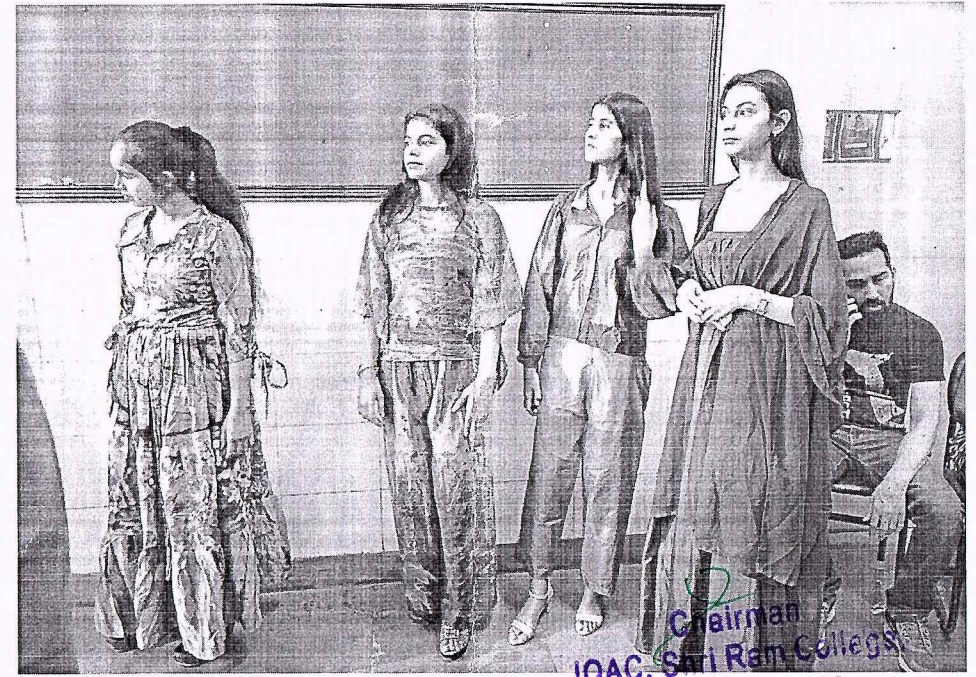

Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar


Chairman
IQAC, Shri Ram College,
Muzaffarnagar





Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar



Chairman
IQAC, Shri Ram College
Muzaffarnagar

Faculty of Fine Arts
Shri Ram Group of Colleges

on
'23
Day 1

प्राप्तो

Models name

Ashna

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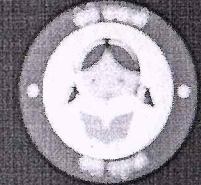
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Faculty of Fine Arts
Shri Ram Group of Colleges

Presents

Fashion Splash '23

Theme of the Day 1



पेटी बचाओ
पेटी पढ़ाओ

Faculty of Fine Arts
Shri Ram

Fa Spl

Theme



साय

Co-ordinator
IAC, Shri Ram College
Muzaffarnagar

Chairman
IAC, Shri Ram College
Muzaffarnagar



Co-ordinator
Shri Ram College
Muzaffarnagar

Chairman
IQAC, Shri Ram College,
Muzaffarnagar



Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar

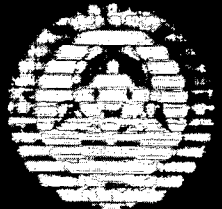
Chairman
IQAC, Shri Ram College,
Muzaffarnagar

Institute of Fine Arts
San Ram Group of Colleges

Presents

Fashion Splash '23

Theme of the Day 1



बेटी बचाओ
बेटी पढ़ाओ







Shri Ram College

Approved by UGC, NCTE and Affiliated to MS University, Saharanpur
Muzaffarnagar - 251001, NCR (U.P.)

A++ Grade Accredited by NAAC

Date: 15 Sep 23

To,
The Proprietor
Ram Kumar Jewellers (P) Ltd
Muzaffarnagar

Subject: Proposal for Sponsorship for Fashion Splash Collection

Dear Sir,

We are pleased to announce that Shri Ram College is hosting its annual Fashion Splash 23(Fashion Show) on **November 24th, 25th, and 26th, 2023**, at our **Sports Ground**. This event serves as a platform for our talented students to showcase their creativity, innovation, and passion for fashion.

To make this event a grand success, we are seeking sponsorship for the students' fashion show collection. We believe that partnering with **Ram Kumar Jewellers**, renowned for its commitment to quality and elegance aligns perfectly with the vision of our event.

Key Highlights of the Event:

- **Dates:** November 24, 25, and 26, 2023
- **Venue:** Shri Ram College Sports Ground
- **Audience:** Over 60 including students, faculty, alumni, and invited dignitaries.
- **Collection:** Approx 600 Costume made by students
- **Media Coverage:** The event will receive coverage in local and regional media, offering significant brand visibility for your organization.
- **Footfalls:** 3000 each day Approx
- **Nation & International Model:** 8 International Female Models & 10 National Models Female and 10 National.

Benefits for Ram Kumar Jewellers (P) Ltd:

1. Exclusive branding opportunities throughout the event.
2. Acknowledgment in all promotional materials, including banners, flyers, and social media posts.

Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar

Chairman
IQAC, Shri Ram College,
Muzaffarnagar

Contact @ 9927028908, 9927011422

Website : www.srgcmzn.com E-Mail : src_mzn@rediffmail.com

3. Opportunity to distribute promotional materials or samples to the audience.
4. Recognition during the event announcements.

We would be honored to collaborate with Ram Kumar Jewellers (P) Ltd and would be delighted to discuss the sponsorship details further. Enclosed with this letter is a detailed sponsorship proposal for your reference.

We hope you share our enthusiasm for this exciting event and look forward to your positive response. Should you have any questions or require additional information, please feel free to contact us at **fdmana@gmail.com** or **8272002220**.

Thank you for considering our request. We look forward to the possibility of a mutually beneficial partnership.

Warm Regards,



Dr Manoj Dhiman
Director, Fine Arts
Shri Ram College, Muzaffarnagar



Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar



Chairman
IQAC, Shri Ram College,
Muzaffarnagar



RAMKUMAR JEWELLERS (P) LTD.

Showroom : 10, Bhagat Singh Road, Muzaffarnagar (U.P.)

Ph.: +91-131-2431384, 2634290

e-mail : ramkumarjewellersmzn@gmail.com

Ref. No

Date: Nov-2-25 Dated

To,
The Director- Faculty of Fine Arts
Shri Ram College, Muzaffarnagar

Subject: Acceptance of Grant-in-Aid for Ornaments for Students' Fashion Show Collection

Dear Dr. Manoj Dhiman,

We are pleased to accept a grant of Rs. 40,000 from Ram, Kumar Jewellers, Muzaffarnagar for development of ornaments for your students' upcoming fashion show collection. It is an honour for Ram Jewellers to collaborate with such a prestigious institution that nurtures creative talent in the field of art and design.

Thank you once again for this wonderful opportunity to collaborate and contribute to the development of young artists and designers.

Warm Regards,

Peeyush Goel
Ram Kumar Jewellers
Muzaffarnagar

Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar

Chairman
IQAC, Shri Ram College,
Muzaffarnagar



**Shri Ram College, Muzaffarnagar
(Faculty of Fine Arts)**

Date: 20 Nov 23

**To,
The Owner
Ram Jewellers,
Muzaffarnagr, UP**

Subject: Heartfelt gratitude for supporting our students with **₹40,000** for designer collection of ornaments.

Dear Shri Ram Jewellers, Muzaffarnagar

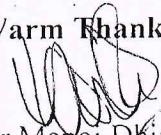
On behalf of Dr Manoj Dhiman, Dir- Fine Art, I extend our heartfelt thanks for your generous contribution towards our heartfelt gratitude for supporting our students with **₹40,000** for designer collection of ornaments. Your support has been instrumental in empowering our talented student to bring their creative vision to life.

Your sponsorship not only facilitated the realization of this collection but also motivated students to strive for excellence. It is partnerships like yours that enable aspiring designers to achieve their dreams and set a foundation for their future success.

We deeply appreciate your commitment to nurturing creativity and supporting emerging talent. Please feel free to visit Fashion Splash 2023 to witness the results of your invaluable support.

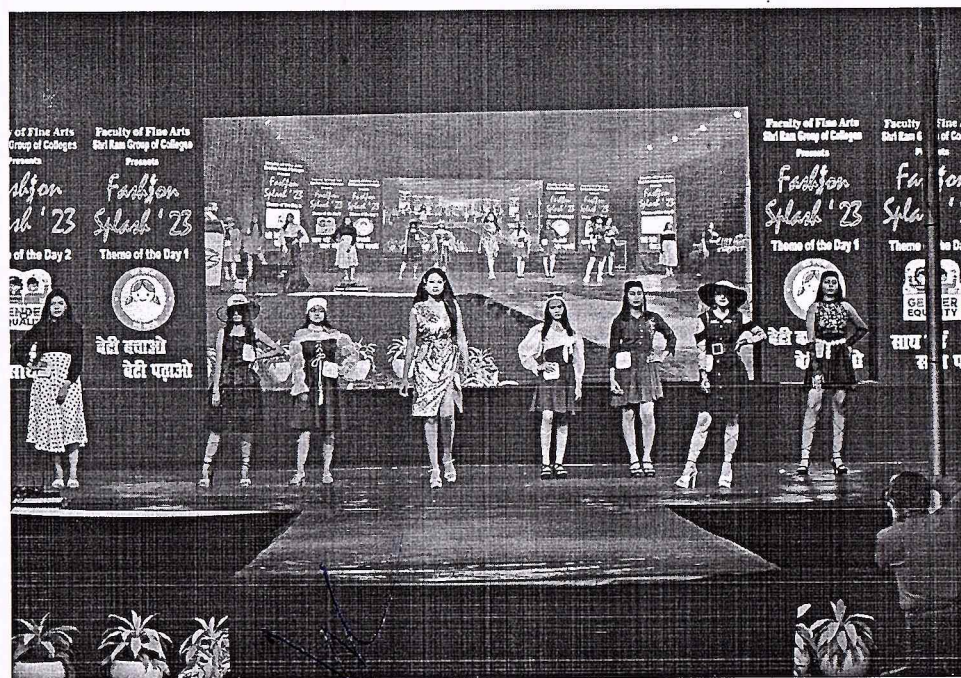
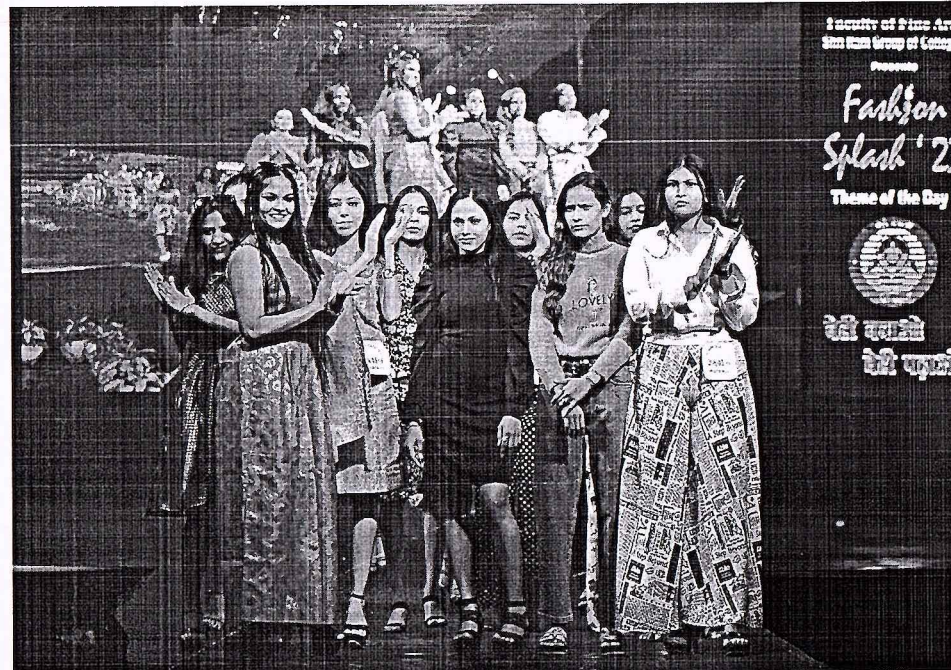
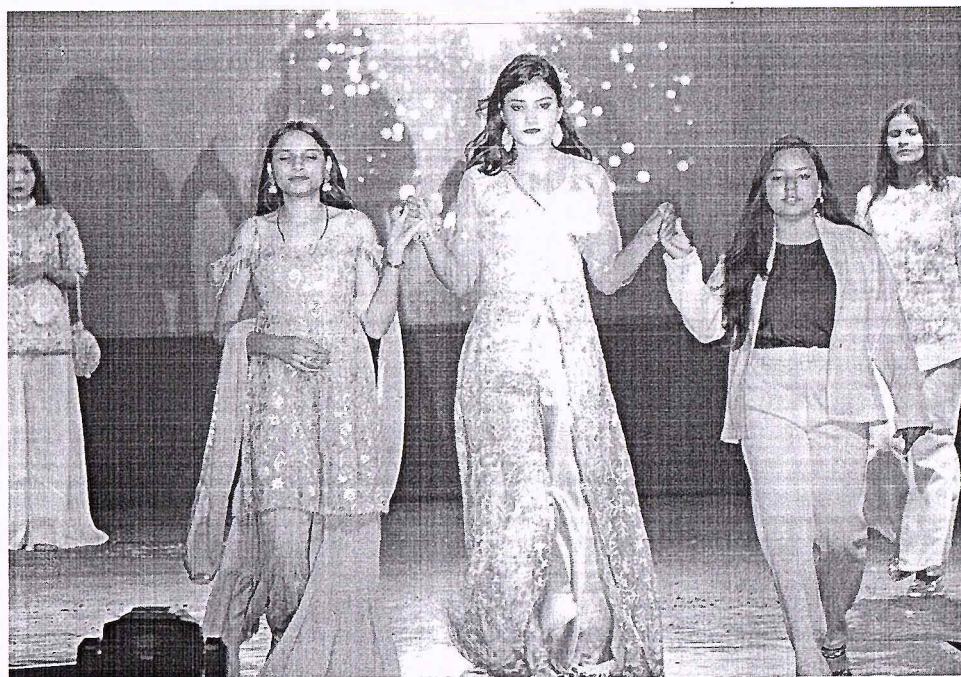
Thank you once again for your generosity and belief in our mission. We look forward to staying connected and collaborating in future endeavors.

Warm Thanks & Regards,


Dr Manoj Dhiman
Director- Fine Arts
Shri Ram College, Muzaffarnagar

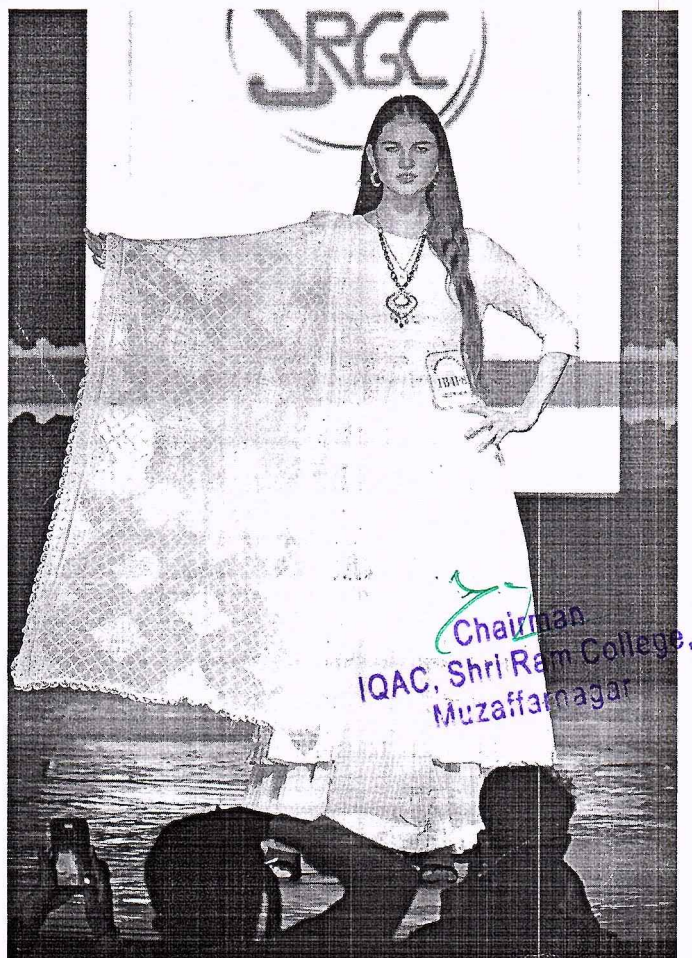
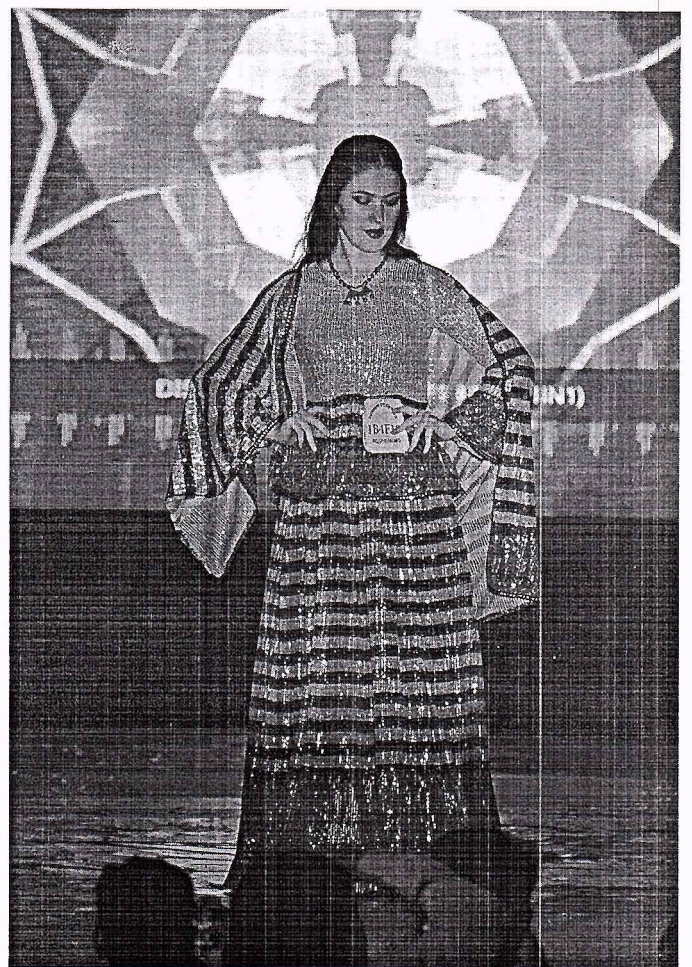

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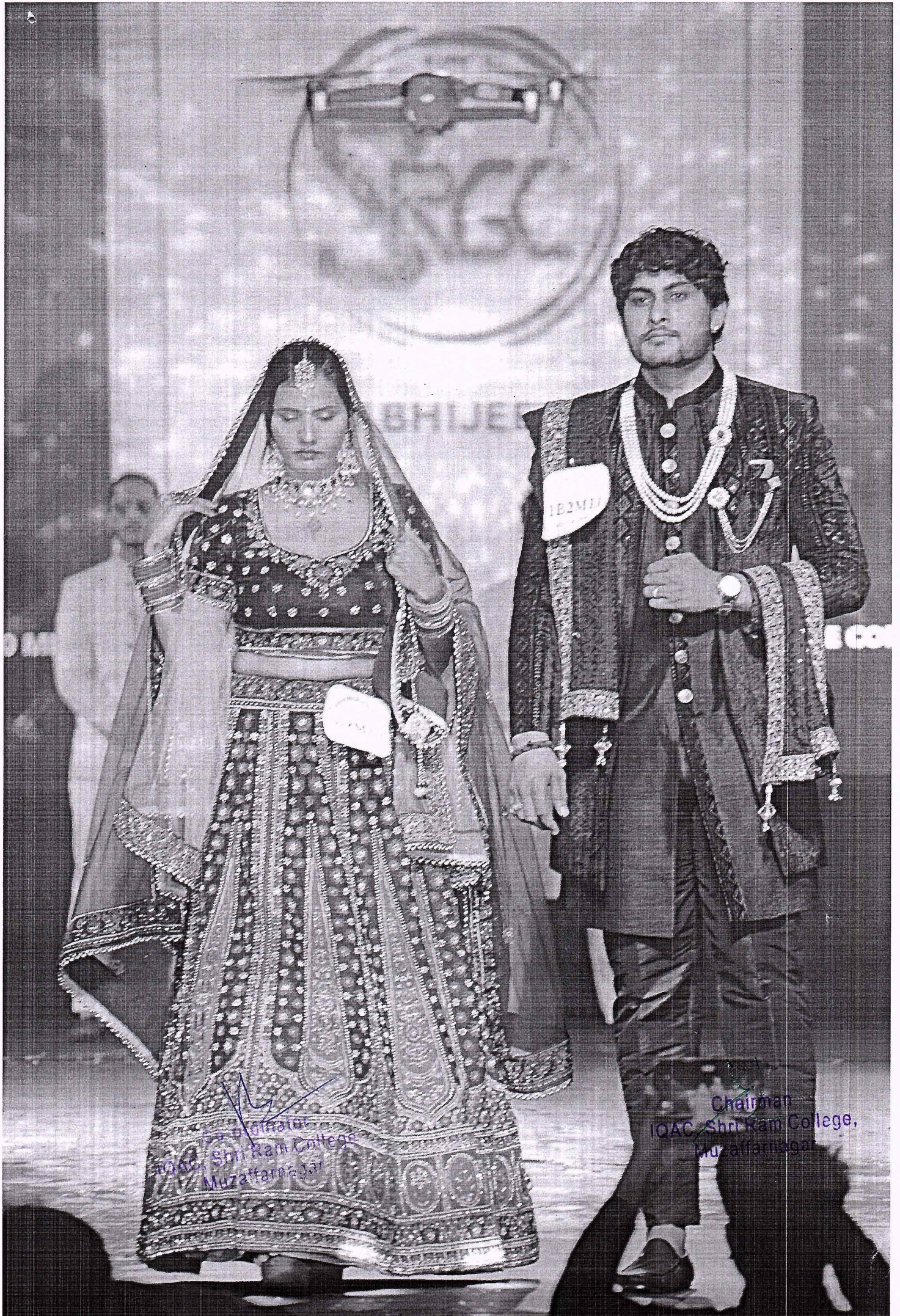
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DESIGNER

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FACULTY OF FINE ARTS

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Muzaffarnagar

Chairman
IQAC, Shri Ram College,
Muzaffarnagar

Fine Arts
College

on
'23
Day 1

पुष्पाओ

Session - II (Theme: Creative Wears)

Round - Ethnic Libas

DESIGNERS

Priya

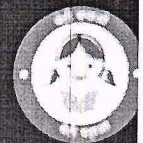
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Faculty of Fine Arts
Shri Ram Group of Colleges

Presents

Fashion
Splash '23

Theme of the Day



बेटी बचाओ
बेटी पढ़ाओ



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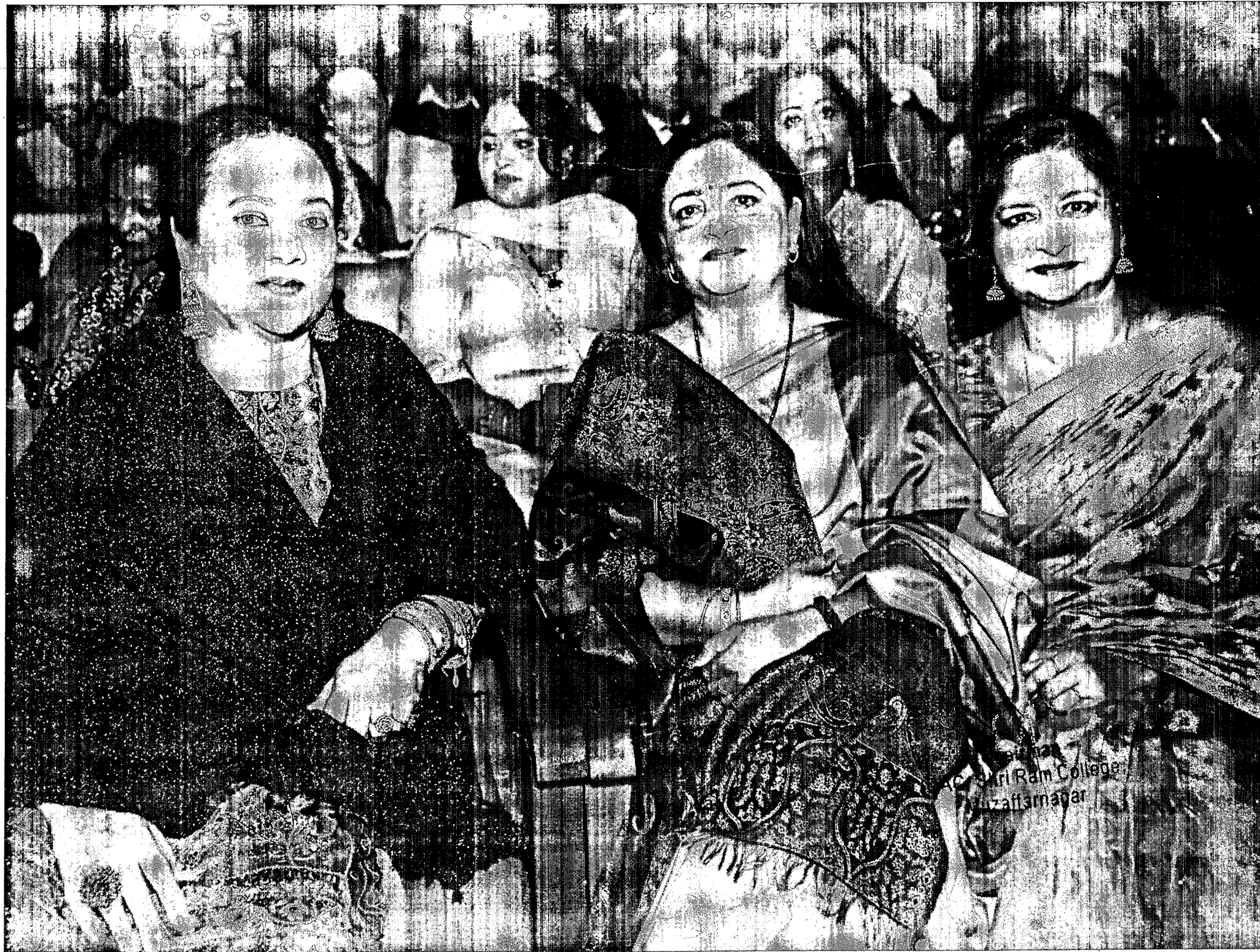
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Muzaffarnagar



Shri Ram College
Muzaffarnagar

Faculty of Fine Arts
Shri Ram Group of Colleges
Presents

Fashion
Splash '23

Theme of the Day 2

Faculty of Fine Arts
Shri Ram Group of Colleges
Presents

Fashion
Splash '23

Theme of the Day 1

Faculty of Fine Arts
Shri Ram Group of Colleges
Presents

Fashion
Splash '23

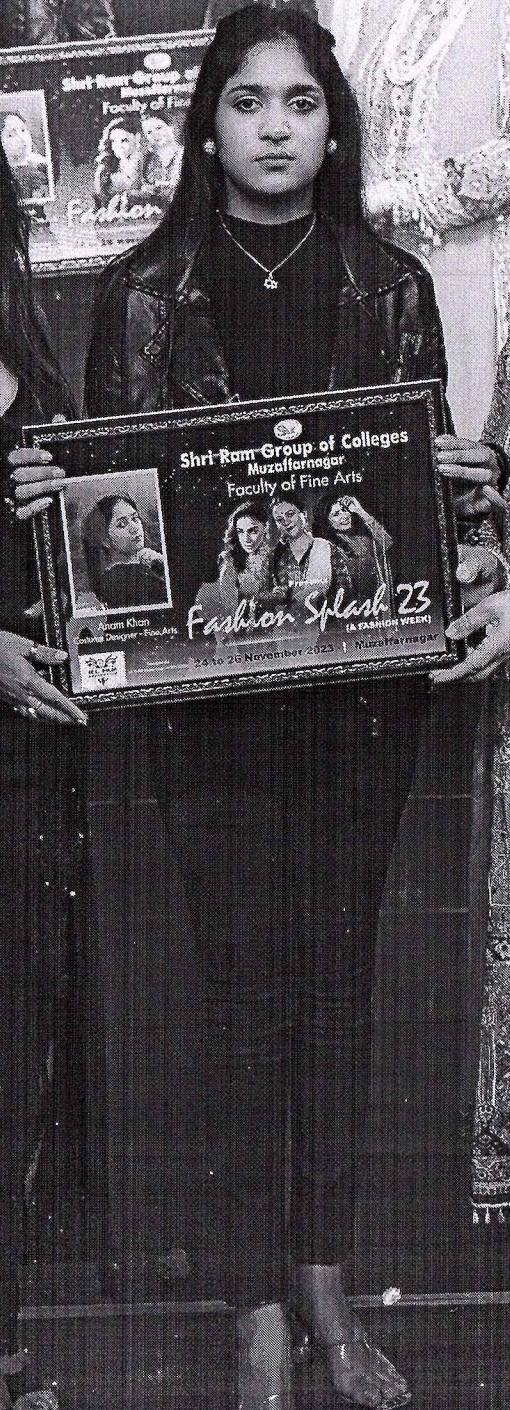
Theme of the Day 1

Faculty of Fine Arts
Shri Ram Group of Colleges
Presents

Fashion
Splash '23

Theme of the Day 2

Shri Ram Group of Colleges
Muzaffarnagar
Fashion '23
of the Day 1



Shri Ram Group of Colleges
Muzaffarnagar

Chairman
Shri Ram College
Muzaffarnagar

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one of the Day 1



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Muzaffarnagar

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Splash '23

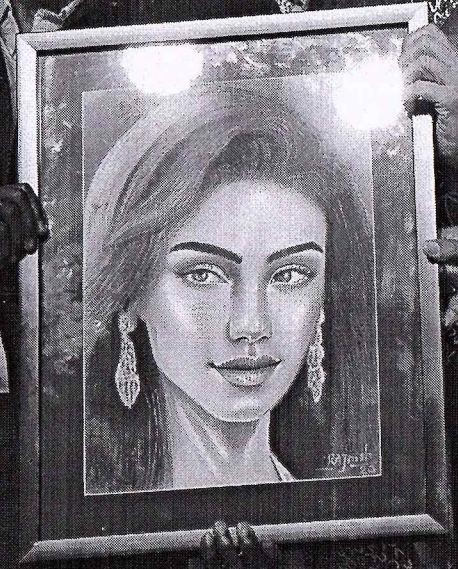
Theme of the Day 1



बेटी बचाओ
बेटी पढ़ाओ

Faculty of Fine Arts Presents

Splash '23
Fashion W



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Sri Ram College
Muzaffarnagar





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Shri Ram College
Muzaffargarh

Shri Ram College Muzaffarnagar

Faculty of Fine Arts

Presents

Fashion Splash 23

(A Fashion Week)

on
24, 25 & 26 Nov 23



Mahak Chahal
(Bollywood Actress & Model)



Mandakini
(Bollywood Actress)



Vindhya Tiwari
(Bollywood Actress & Model)

LIVE FOR
FASHION

Shri Ram College, Parikarma Marg, Muzaffarnagar

Chairman
QAC, Shri Ram College,
Muzaffarnagar

Co-ordinator
QAC, Shri Ram College

**Shri Ram College
Muzaffarnagar**

**Faculty of Fine Arts
Presents**



Mehak Chahal
(Bollywood Actress & Model)

Fashion Splash 23

(A Fashion Week)

24, 25 & 26 Nov 23

**LIVE FOR
FASHION**

Shri Ram College, Parikarma Marg, Muzaffarnagar

Managed by
Dr. Huzefa Khan 9781736964



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Chairman
IOAC, Shri Ram College
Muzaffarnagar

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IQAC, Shri Ram College,
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Muzaffarnagar

Faculty of Fine Arts

Shri Ram Group of Colleges
Muzaffarnagar
Faculty of Fine Arts

Presented

Fashion Splash 23
(A FASHION WEEK)

24 to 26 November 2023 | Muzaffarnagar

Shri Ram Group of Colleges
Muzaffarnagar
Faculty of Fine Arts

Certificate of Appreciation

Certified that
Ms. Hemantika Singh
has participated in the
Fashion Splash 23 (A Fashion Week) held on 24th, 25th & 26th November 2023.
Her performance was appreciated by the audience.

Ms. Hemantika Singh
The SRC's family wish her the best of success in her future endeavours.

Dr. Manoj Kumar
Chairman, IQAC

Dr. Manoj Kumar
Principal

Shri Ram Group of Colleges
Muzaffarnagar
Faculty of Fine Arts

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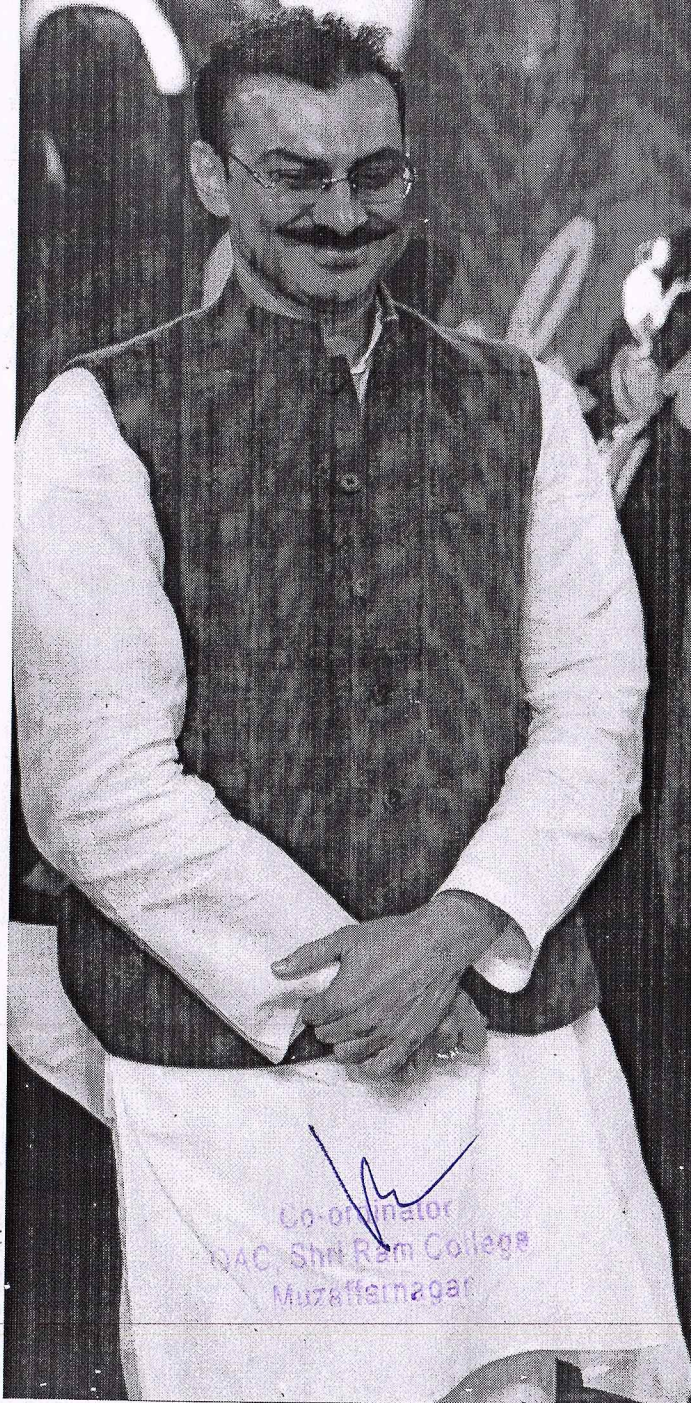
Dr. Manoj Kumar
Principal

Chairman
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Shri Ram Group of Colleges Muzaffarnagar

Faculty of Arts Presents

Indian Fashion



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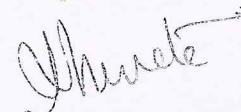
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QAC, Shri Ram College
Muzaffarnagar

Shri Ram College, Muzaffarnagar
Department of Home Science
Two Days Seminar
On
"Financial Literacy and Independence for Women"

Notice

Dated: 30th September 2023

As part of Shri Ram College initiative to offer continuing support to faculty members & students, Department of Home Science is going to organize a Two days Seminar on the title "Financial literacy and Independence for Women" on the day 27th & 28th October, 2023. Interested faculty members & Students can register by providing details to Ms. Sofiya Ansari (Assistant Prof. Department of Home Science) till 15th October 2023.


Dr. Shweta Rath
Head, Department of Home Science

Cc To

1. Principal, SRC 
2. Vice Principal, Teacher Education
3. Dean, Computer Appl. Dept. 
4. HOD, Bioscience Dept.
5. HOD, Basic Science Dept.
6. HOD, Commerce Dept. 
7. HOD, Business Adm. Dept. 
8. HOD, Journalism & Mass Comm. Dept. 
9. HOD, Fine Art Dept. 
10. HOD, Physical Edu. Dept.
11. HOD, Agriculture Dept. 


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Shri Ram College, Muzaffarnagar
Department of Home Science
Two Days Seminar
On
"Financial literacy and Independence for Women"
INVITATION TO RESOURCE PERSON

Dated: 17 October 2023

Resource Person and Chief Guest: Dr. Saurabh Mittal

Dean Commerce and Business Administration, Shri Ram College
Muzaffarnagar

Dear Sir,

Warm greetings, Department of Home Science, Shri Ram College are going to organize a Two days Seminar on the topic "**Financial Literacy and Independence for Women**" on the day 27th & 28th October 2023. As one of the efficient professors in West UP we invite you to be our Resource Person on 27th October 2023 at 11:00 AM. We appreciate it if you come in our institute for give your valuable Knowledge and Information to our students.

The participant and organizer will be benefitted a lot from your expertise on the topic. If you have any query related to this seminar, kindly contact us at 8307471504.

Thanking you.


Dr. Shweta Rath
Head, Dept. of Home Science


Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar


Chairman
IQAC, Shri Ram College,
Muzaffarnagar

Shri Ram College, Muzaffarnagar
Department of Home Science
Two Days Seminar
On
“Financial literacy and Independence for Women”

INVITATION TO RESOURCE PERSON

Dated: 17 October 2023

Resource Person: Dr. Arif

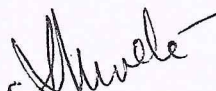
Assistant Professor, Govt. P.G College, Devband

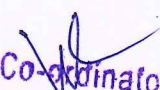
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Thanking you.


Dr. Shweta Rath
Head, Dept. of Home Science


Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar


Chairman
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Muzaffarnagar

Shri Ram College, Muzaffarnagar
Department of Home Science
Two Days Seminar
On
“Financial literacy and Independence for Women”

INVITATION TO RESOURCE PERSON

Dated: 17 October 2023

Resource Person: Dr. Aditya Gautam

Principal, Hari Om Saraswati PG College, Dhanori

Dear Sir,

Warm greetings, Department of Home Science, Shri Ram College are going to organize a Two days Seminar on the topic **“Financial Literacy and Independence for Women”** on the day **27th & 28th October 2023**. As one of the efficient professors in West UP we invite you to be our Resource Person on 27th October 2023 at 11:00 AM. We appreciate it if you come in our institute for give your valuable Knowledge and Information to our students.

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Thanking you.


Dr. Shweta Rath
Head, Dept. of Home Science


Co-ordinator
ICAC, Shri Ram College
Muzaffarnagar


Chairman
ICAC, Shri Ram College,
Muzaffarnagar.

Shri Ram College, Muzaffarnagar
Department of Home Science
Two Days Seminar
On
"Financial literacy and Independence for Women"

INVITATION TO RESOURCE PERSON

Dated: 17 October 2023

Resource Person: Dr. MamtaShyam

Associate Professor, SD College Muzaffarnagar

Dear Madam,

Warm greetings, Department of Home Science, Shri Ram College are going to organize a Two days Seminar on the topic "**Financial Literacy and Independence for Women**" on the day 27th & 28th October 2023. As one of the efficient professors in West UP we invite you to be our Resource Person on 27th October 2023 at 11:00 AM. We appreciate it if you come in our institute for give your valuable Knowledge and Information to our students.

The participant and organizer will be benefitted a lot from your expertise on the topic. If you have any query related to this seminar, kindly contact us at 8307471504.

Thanking you.



Dr. ShwetaRathi
Head, Dept. of Home Science



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Shri Ram College, Muzaffarnagar

Department of Home Science

Layout

A Two Days Seminar

On

Financial literacy and Independence for Women

Day I: 27th October 2023

08:30 -09:30am

Registration & Reception

09:30 -11:00am

Continental Breakfast

11:00 -10:30am

Inaugural ceremonies & lamp lightening

11:30 -12:00 am

Keynote Addresses by Sofiya Ansari

12:00 -1:00 pm

Session I by Dr. Mamta Shyam

01:00 -2:00 pm

Session II by Dr. Saurabh Mittal

02:00- 03:00 pm

Lunch

03:00- 03:30 pm

Evening Reception

03:30- 04:00 pm

Feedback Session

Co-ordinator
IQAC, Shri Ram College
Muzaffarnagar

Day II: 28th October 2023

09:30 -10:00 am

Continental Breakfast

10:00 -10:30 am

Keynote Addresses by Sofiya Ansari

10:30 -12:00 pm

Debate, Session I

12:00- 01:30 pm

Debate, Session II

01:30- 02:30 pm

Lunch

02:30- 04:00 pm

Debate, Session III

04:00- 04:30 pm

Valedictory Session

04:30- 05:00 pm

Vote of Thanks by Dr. Shweta Rathi, Head Dept. of Home Science

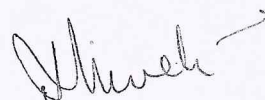
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Layout for the Seminar

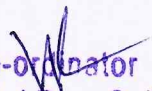
- Welcome to the Guest
- Lamp lighting
- Bouquet presentation to the Guest
- Introduction to the Guest
- Information given by Dr. Saurabh Mittal
- Vote of Thanks by Dr. Shweta Rathi, (Head of H.Sc. Dept)

Event Summary

- Time: 10:00A.M To 4:00P.M
- Venue: Department of Home Science SRC
- Date: 27th October 2023
- Student Present: 1-10
- Event Coordinator: Dr. ShwetaRathi
- Co-coordinator:Ms. Sofiya Ansari
- Supporting Faculty: Ms. Ruby Poswal
- Resource person: Dr. Mamta Shyam and Dr. Saurabh Mittal



Dr. ShwetaRathi
Head, Dept. of Home Science



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Shri Ram College, Muzaffarnagar
Department of Home Science
Two Days Seminar
On
“Financial Literacy and Independence for Women”

Report

Venue: Department of Home Science, Shri Ram College

Department of Home Science organized a “Two days Seminar on the topic “Financial Literacy and Independence for Women” on 27th and 28th October 2023 respectively.

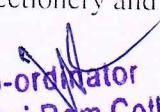
Objective of the Seminar

The two-day seminar was organized to raise awareness and equip women with essential financial literacy and strategies for achieving financial independence. The seminar aimed to empower participants with the knowledge and tools to make informed financial decisions and encourage economic self-reliance.

This Seminar helps in developing entrepreneurial abilities among female students and other women attending this seminar. The skills that are required to run a business successfully are developed among the students through this Seminar. Sometimes, students may have skills but it requires polishing and incubation. This Seminar is perfect for them to boost their confidence and to inculcate in them the ability and idea to establish their businesses or freelancing. This seminar consists of a delivery of an amazing lecture by our keynote speaker to develop an individual as an entrepreneur effectively and then there will be a debate session as well. We are glad to announce that our respected chief guest and resource person Dr. Sourabh Mittal is the owner of Sourabh Mittal & Associates. He has been a great inspiration for the students during the seminar through his valuable lecture.

Entrepreneurship in Home Science is an interdisciplinary field of knowledge with focus on Food & Nutrition, Fabric & Apparel Designing, Human development, Resource Management and Communication & Extension. Earlier it prepared an individual obtain recent scientific information to cope with the day-to-day problems but today efforts are being made to provide facilities to invigorate the theoretical knowledge of the students through field training and research laboratories so that they are able to launch entrepreneurship program successfully.

Food and Nutrition deals with nature of food; the constituents of food; food required for the growth and maintenance of body functions; food needs at the different stages of life; nutrimental deficiencies and ways of overcoming them; preparation of food in a way so as to conserve the maximum nutritive value and preserve its flavor; the biochemical changes that food undergo during digestion; preservation of food and food habits. The study in this field objectively prepares the students to work in any of the following enterprises: - Catering, Confectionery and Bakery, Ready to cook/Serve food. Health centers, Hobby centers etc.


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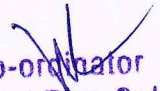

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Resource management: Resource Management undertakes the study of managing the home economically and effectively. The home implies the basic facts about housing designs, furnishing which will save money and labor and methods of getting the maximum work done through the minimum equipment. Management of home is making the best use of the available resources, to derive the best value to conserve time, energy, money, space and labor. An individual could open their own craft workshop, can go in field of interior designing, hobby centers etc.

Fabric and apparel designing: This domain of Home Science focus on the selection, construction and care of clothing; its effect on the family income; the behavior and chemical nature of different textiles; types of weaves; the quality, color, shrink ability and durability of fabrics; quality of natural fibers like silk, wool, cotton, nature of synthetic fibers like nylon, rayon, tericot etc.

Human development: Human Development enriches emotional relationship among family members. The most important amongst a family are the children. They must be brought up in an atmosphere conducive to growth and development. Children's character must be strengthened to meet the challenges of their life by their parents and other family members. An individual could open their own child care centers, old age homes, Rehabilitation centers for children with special needs etc.

Extension Education: Home Science extension education is a method of sharing scientific technical information with people who are underprivileged or have limited access to formal education. The goal is to improve their quality of life by helping them develop skills and knowledge and by changing their behaviors.


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Muzaffarnagar

Day 1 Highlights

Inauguration

The seminar commenced with an inauguration ceremony. The Chief Guest, Dr. Saurabh Mittal delivered the opening remarks emphasizing the importance of financial literacy for women. The session began with a welcome speech by Dr. Shweta Rath, followed by the lighting of the lamp.

Ceremony:

Keynote Addresses:

- **Speaker 1: Dr. Saurabh Mittal**
 - Topic: "Fundamentals of Financial Literacy"
 - Summary: Dr. Mittal elaborated on the basics of financial management, emphasizing budgeting, savings, and investment.
 - Dr. Mittal has also generously contributed **INR 32,600 through Saurabh Mittal and Associates to support the event.**
- **Speaker 2: Dr. Arif**
 - Topic: "Women and Financial Independence"
 - Summary: Dr. Arif highlighted strategies for achieving financial independence and discussed common financial challenges faced by women.

Panel Discussion:

A panel discussion on "Breaking Barriers: Financial Empowerment for Women" was held. The session focused on "practical solutions to overcome societal and economic barriers"


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Day 2 Highlights

Keynote Addresses:

- **Speaker 1: Dr. Mamta Shyam**
 - Topic: "Understanding Financial Products"
 - Summary: Dr. Shyam offered a comprehensive overview of various financial products and their relevance to women's financial goals.
 - Dr. Shyam conducted an interactive workshop, guiding participants on creating a personal financial plan tailored to their needs.
- **Speaker 2: Dr. Aditya Gautam**
 - Topic: "Building Wealth through Smart Investments"
 - Summary: Dr. Gautam emphasized the importance of strategic investments and discussed long-term wealth-building techniques.
 - Dr. Gautam provided practical insights into investment options and discussed risk management for new investors.

Valedictory Session:

The seminar concluded with a valedictory session, where Dr. Mamta Shyam addressed the audience and distributed certificates to the participants. After that Dr. Prerna Mittal, Principal Shri Ram Colleg delivered the vote of thanks.

Outcomes of the Seminar

1. Increased awareness among participants about financial literacy and its significance.
2. Practical tools and strategies provided for managing personal finances.
3. Networking opportunities for participants to connect with experts and peers.
4. Positive feedback received regarding the relevance and quality of sessions and workshops.

Acknowledgments

We extend our heartfelt gratitude to Dr. Saurabh Mittal, Dr. Arif, Dr. Mamta Shyam, Dr. Aditya Gautam, and the organizing team for their invaluable contributions in making the seminar a success.

Conclusion

The program was concluded by the valedictory session which was undergone in presence of Dr. S.C. Kulshreshtha, Founder, Shri Ram Group of Colleges where resource person was **presented** by a memento and a certificate of appreciation. Also each student organizer was awarded by a certificate of appreciation. About 126 students and 22 faculties were benefitted by this workshop and awarded by a certificate of appreciation. A vote of Thanks by Dr. Shweta Rathi Head, Department of Home Science marked the end of the Two-day Seminar.


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SHRI RAM COLLEGE MUZAFFARNAGAR

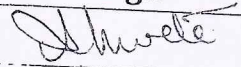
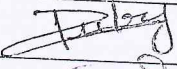
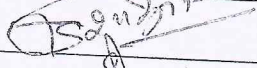
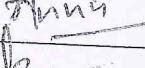
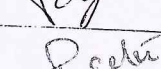
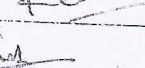
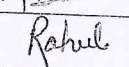
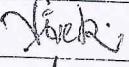
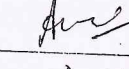
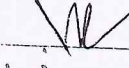
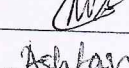
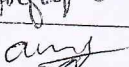
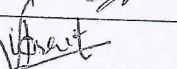
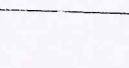
Department of Home Science

Two days seminar

On

"Financial literacy and independence for women"

Attendance Sheet

S.NO.	Faculty Name	Department	Sign
1	Dr. Shweta Rathi	Home Science	
2	Ruby Poswal	Home Science	
3	Isha Arora	Home Science	
4	Sofiya Ansari	Home Science	
5	Dr. Annu Nayak	Fine Arts	
6	Binnu pundir	Fine Arts	
7	Dr. Pooja Tomar	Basic Science	
8	Dr. Ritu Pundir	Basic Science	
9	Dr. Rishabh Bhardwaj	Basic Science	
10	Dr. Rahul Arya	Basic Science	
11	Rajdeep Sehrawat	Basic Science	
12	Vivek Kashyap	Basic Science	
13	Dr. Ashok Kumar	Director, SRGC	
14	Dr. Vineet Kumar Sharma	Dear: IQAC	
15	Dr. Manoj-Mittal	Basic Science	
16	Dr. Nayeem Ali	Agriculture	
17	Dr. Ashfaq Ali	Agriculture	
18	Dr. Anjali Jhakar	Agriculture	
19	Dr. Vikrant	Agriculture	

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Department of Home Science

Two days Seminar

On

"Financial literacy and Independence for Women"

Attendance Sheet

S.NO.	Candidate Name	Class	Sign
1	ALISHA	Home Science	Alisha
2	ANAM CHAUHAN	Home Science	Anam
3	APURVA CHAUDHARY	Home Science	Apurva chaudhary
4	ARPANA	Home Science	
5	HEENA TYAGI	Home Science	Heena Tyagi
6	IRAM BEG	Home Science	Iram Beg
7	KHUSHBOO	Home Science	Khushboo
8	KHUSHI INSA	Home Science	Khushi Insa
9	LAYABA NOOR	Home Science	Laybanoor
10	LAYBA	Home Science	
11	LEEZA KAUSAR	Home Science	Leeza Kausar
12	MADHU	Home Science	Madhu
13	MANISHA	Home Science	Manisha
14	MANTASHA	Home Science	Mantasha
15	NAINA	Home Science	Naina
16	NEESHU	Home Science	Neeshu
17	NEHA BALIYAN	Home Science	Neha baliyan
18	NEHA SHARMA	Home Science	Neha sharma
19	NIDHI	Home Science	Nidhi
20	POOJA	Home Science	Pooja
21	PRIYANKA	Home Science	Priyanka
22	RAJNI	Home Science	Rajni
23	RAMA	Home Science	Rama
24	RAVITA	Home Science	Ravita
25	RUBY	Home Science	Ruby
26	SADIA	Home Science	Sadiya
27	SAKSHI	Home Science	Sakshi
28	SALONI	Home Science	Saloni
29	SIMRAN INSA	Home Science	Simran Insa
30	SOFIYA	Home Science	Sofiya
31	TANSEEM SAIFI	Home Science	Tanseem Saifi
32	TANU	Home Science	Tanu
33	TANU	Home Science	Tanu
34	TANU DHIMAN	Home Science	Tanu dhiman
35	VANSHIKA	Home Science	Vanshika
36	VARSHA	Home Science	Varsha
37	VASHU	Home Science	Vashu
38	DIVYA	Home Science	Divya
39	IQRA TABASSUM	Home Science	Iqra tabassum
40	DIKSHA	Home Science	Diksha
41	DIVYA TYAGI	Home Science	Divya tyagi
42	DIVYANSHI CHIKARA	Home Science	Divyanshi Chikara
43	Co-ordinator	Home Science	Chikara

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44	FARHEEN NAAZ	Home Science	Farheen Naaz
45	GUNJAN	Home Science	Gunjan
46	HARSHA	Home Science	Harsha
47	JASMINE KHAN	Home Science	Jasmine Khan
48	KHUSHI	Home Science	Khushi
49	KHUSHI	Home Science	Khushi
50	KRITIKA AGARWAL	Home Science	Kritika Agarwal
51	LUBNA KHAN	Home Science	Lubna Khan
52	MEHVISH ARSHAD	Home Science	Mehvish Arshad
53	NANDINI	Home Science	Nandini
54	NEHA	Home Science	Neha
55	NIKITA SAINI	Home Science	Nikita Saini
56	REETA	Home Science	Reeta
57	RICHA ARYA	Home Science	Richa Arya
58	SALONI RANI	Home Science	Saloni Rani
59	SANIYA	Home Science	Saniya
60	SONAM	Home Science	Sonam
61	SONAM SAIFI	Home Science	Sonam
62	SWATI MALIK	Home Science	Swati Malik
63	VARSHA	Home Science	Varsha
64	ZAINAB RIYAZ	Home Science	Zainab Riyaz
65	AFREEN	Home Science	Afreen
66	ALISHA	Home Science	Alisha
67	ALMISBAH	Home Science	Almisbah
68	ANANYA GARG	Home Science	Ananya Garg
69	ANSHIKA	Home Science	Anshika
70	AYUSHI	Home Science	Ayushi
71	FALAK TYAGI	Home Science	Falak Tyagi
72	FIRDOUS ZAIDI	Home Science	Firdous Zaidi
73	HIMANSHI PAL	Home Science	Himanshi Pal
74	KHUSHBOO	Home Science	Khushboo
75	LAYBA	Home Science	Layba
76	MANISHA	Home Science	Manisha
77	MANSI	Home Science	Mansi
78	MEGHA RANI	Home Science	Megha Rani
79	MEHWISH	Home Science	Mehwish
80	NASIMA	Home Science	Nasima
81	PAYAL	Home Science	Payal
82	PRITI PAL	Home Science	Priti Pal
83	SANA ANSARI	Home Science	Sana Ansari
84	SANA PARVEEN	Home Science	Sana Parveen
85	SARITA	Home Science	Sarita
86	SHALU	Home Science	Shalu
87	SHIVANGI	Home Science	Shivangi
88	SIMRAN	Home Science	Simran
89	SUMAILA PRAVEEN	Home Science	Sumaila Praveen
90	SWATI RANI	Home Science	Swati Rani
91	TANU	Home Science	Tanu
92	VANSHIKA CHAUDHARY	Home Science	Vinshika Chaudhary

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93	MANJILA	Fine Arts	Manjila
94	SAMRA NOOR	Fine Arts	Samra Noor
95	SALONI	Fine Arts	Saloni
96	PAYAL SAINI	Fine Arts	Payal Saini
97	PRAGYA GAUTAM	Fine Arts	Ankita
98	ANKITA	Fine Arts	Ankita
99	AMREEN	Fine Arts	Amreen
100	SUHANI	Fine Arts	Suhani
101	NAIMA	Fine Arts	Naima
102	SAKSHI	Fine Arts	Sakshi
103	JYU TI	Fine Arts	Jyuti
104	HADIQA	Fine Arts	Hadiza
105	ANJALI	Fine Arts	Anjali
106	KOMAL	Fine Arts	Komal
107	MINAKASI	Fine Arts	Minakasi
108	AYESHA RIDA	Fine Arts	Ayesha Rida
109	RITIKA	Fine Arts	Ritika
110	PRIYA	Fine Arts	Priya
111	RIYA	Fine Arts	Riya
112	PRITI	Fine Arts	Priti
113	SNEHA	Fine Arts	Sneha
114	HEENA	Fine Arts	Heena
115	ANKITA	Fine Arts	Ankita
116	BABY	Fine Arts	Baby
117	PAYAL	Fine Arts	Payal
118	RICHA	Fine Arts	Richa
119	AANCHAL RANI	Fine Arts	Aanchal Rani
120	ABHISHEK	Fine Arts	Abhishek
121	ABHISHEK KUMAR	Fine Arts	Abhishek Kumar
122	AKHIL KUMAR	Fine Arts	Akhil Kumar
123	AKSHAY BALIYAN	Fine Arts	Akshay Baliyan
124	ALISHA	Fine Arts	Alisha
125	AMAN	Fine Arts	Aman
126	AMBAR GORI	Fine Arts	Ambar Gori
127	ANAM	Fine Arts	Anam
128	ANJALI	Fine Arts	Anjali
129	ANJALI SHARMA	Fine Arts	Anjali Sharma
130	ANSHIKA	Fine Arts	Anshika
131	AVIKA SANGAL	Fine Arts	Avika Sangal
132	AVNI RATHI	Fine Arts	Avni Rathi
133	BHUMIKA	Fine Arts	Bhumika
134	DEEPA RANI	Fine Arts	Deepa Rani
135	DURGESH	Fine Arts	Durgesh
136	HARSHIT VERMA	Fine Arts	Harshit Verma
137	INSHA SAIFI	Fine Arts	Ishta Saifi
138	IRAM JAHAN	Fine Arts	Iram Jahan
139	ISHA	Fine Arts	Isha
140	JAHANVI CHOUDHARY	Fine Arts	Jahanvi
140	GO-ORIN	Fine Arts	Go-Orin

142	KARAN VERMA	Fine Arts	KARAN VERMA
143	KM MONIKA SHARMA	Fine Arts	KM monika Sharma
144	MAHI	Fine Arts	mahi
145	MANU DHIMAN	Fine Arts	Manu Dhiman
146	MANYA SHARMA	Fine Arts	Manya Sharma
147	MOHD AHMED	Fine Arts	MOHD AHMED
148	MOHD RAZA	Fine Arts	MOHD RAZA
149	MOHD SUAIB RANA	Fine Arts	MOHD. SUAIB RANA
150	MU SARIF	Fine Arts	MU Sarif
151	NISHU RANI	Fine Arts	Nishu Rani
152	POOJA NIRWAL	Fine Arts	Pooja
153	PRIYANKA	Fine Arts	Priyanka
154	RACHNA	Fine Arts	Rachna
155	RUBY	Fine Arts	Ruby
156	SALONI	Fine Arts	Saloni
157	SANA ANSARI	Fine Arts	Sana Ansari
158	SARTHAK KUMAR	Fine Arts	Sarthak Kumar
159	SHEETAL PAL	Fine Arts	Sheetal Pal
160	SUHANI RATHI	Fine Arts	Suhani Rathi
161	TANISHA	Fine Arts	Tanisha
162	TANISHKA GAUTAM	Fine Arts	Tanishka
163	TANU	Fine Arts	Tanu
164	UMME HANI	Fine Arts	Umme Hani
165	VANSH SAINI	Fine Arts	Vansh Saini
166	VIKRANT KUMAR	Fine Arts	Vikrant Kumar
167	VISHAKHA	Fine Arts	Vishakha
168	AANCHAL	Basic Science	Aanchal
169	AASHNA RANA	Basic Science	Aashna Rana
170	AAYSHA JAHAN	Basic Science	Aaysha Jahan
171	AAYUSHI	Basic Science	Aayushi
172	AAZADI	Basic Science	Aazadi
173	ADEEBA	Basic Science	Adeeba
174	AKANSHA	Basic Science	Akansha
175	AKANSHA	Basic Science	Akansha
176	ALINA ANSARI	Basic Science	Alina Ansari
177	ALTASHA PARVEEN	Basic Science	Altasha Parveen
178	ANAM	Basic Science	Anam
179	ANGEL	Basic Science	Angel
180	ANJALI	Basic Science	Anjali
181	ANJALI	Basic Science	Anjali
182	ANJALI	Basic Science	ANJALI
183	ANJALI BHOGIYAN	Basic Science	ANJALI
184	ANJALI RANI	Basic Science	ANJALI BHOGIYAN
185	ANKITA PUNDIR	Basic Science	Anjali Rani
186	ANSHIKA	Basic Science	Ankita Pundir
187	ANSHU RANI	Basic Science	Anshika
188	ANUSHKA SANGAL	Basic Science	Anshu Rani
189	AREEBA	Basic Science	Anushka Sangal
190	AYUSHI	Basic Science	Areeba

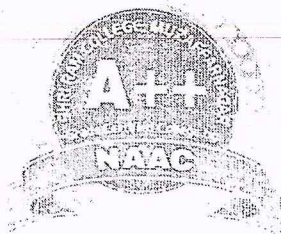
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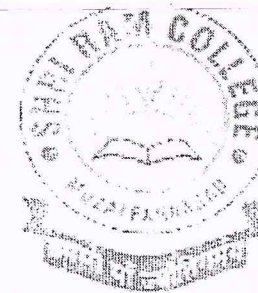
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193	CHHAVI	Basic Science	Chhavi
194	CHHOTI	Basic Science	Chhoti
195	DEEPA	Basic Science	Deepa
196	DEEPA	Basic Science	Deepa
197	DEEPA KUMARI	Basic Science	Deepa Kumari
198	DILKHUSH	Basic Science	Dilkhush
199	DIVYA	Basic Science	Divya
200	DIYA KASHYAP	Basic Science	Diya Kashyap
201	DIYA MALIK	Basic Science	Diya Malik
202	ESHA CHOUDHARY	Basic Science	Esha Choudhary
203	GULNAZ	Basic Science	Gulnaz
204	HIMANI SHARMA	Basic Science	Himani Sharma
205	ILMA ZIA	Basic Science	Ilma Zia
206	ISHA RANI	Basic Science	Isha Rani
207	ISHIKA BANSAL	Basic Science	Ishika Bansal
208	ITY JAIN	Basic Science	Itu Jain
209	KAJAL KASHYAP	Basic Science	Kajal Kashyap
210	KAJAL MALIK	Basic Science	Kajal Malik
211	KAJAL SAINI	Basic Science	Kajal Saini
212	KANISHKA RATHI	Basic Science	Kanishka Rathi
213	KAUSHAL	Basic Science	Kaushal

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DR. PRERNA MITTAL

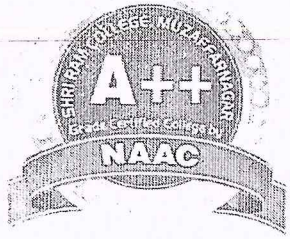
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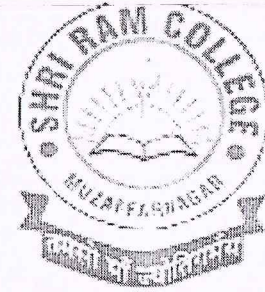
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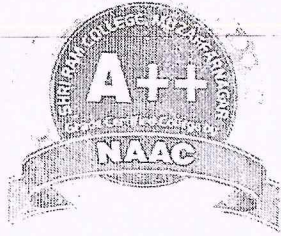
Shweta

DR. SHWETA RATHI

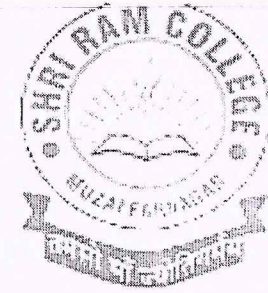
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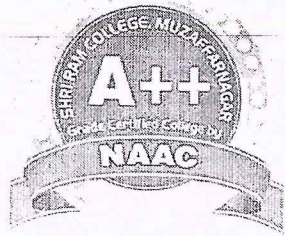
Shweta

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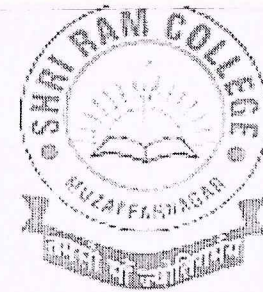
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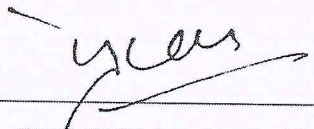


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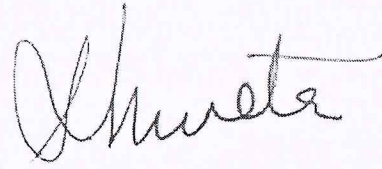
Vivek Kashyap

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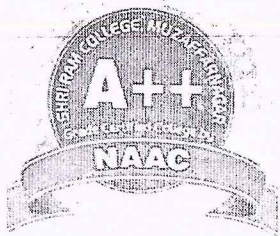
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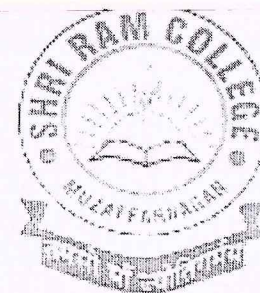
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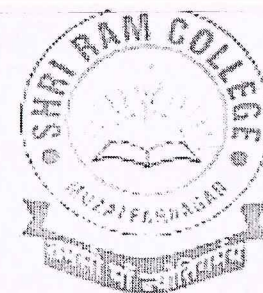
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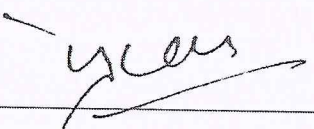
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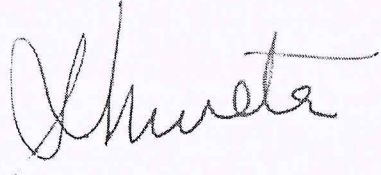
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Manisha

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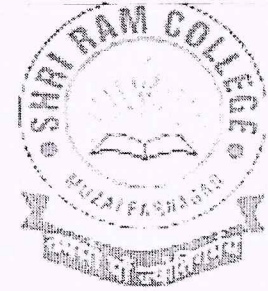

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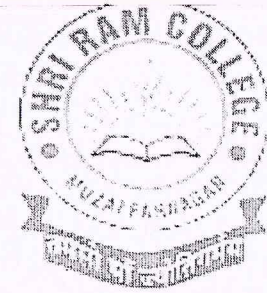
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years
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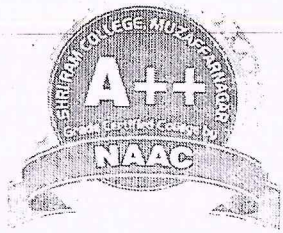
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Shweta
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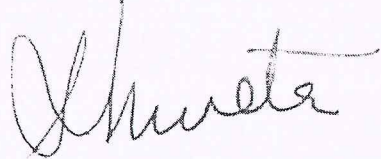
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PROUDLY PRESENT TO

Neha Sharma

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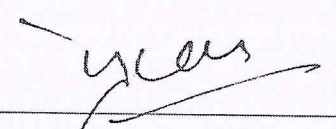
OF PARTICIPATION

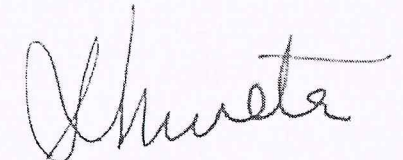
PROUDLY PRESENT TO

Pooja

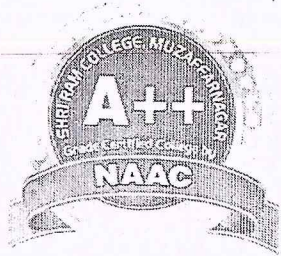
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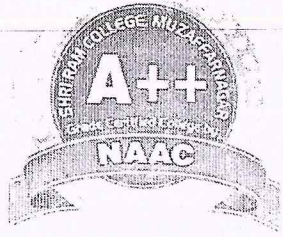
Co-ordinator
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Shweta

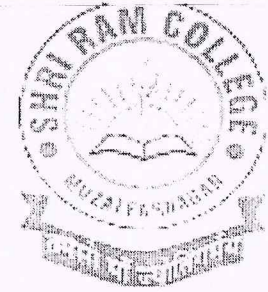
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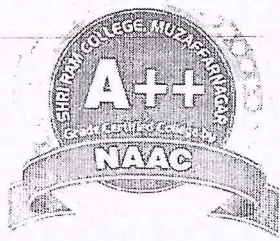
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Shweta

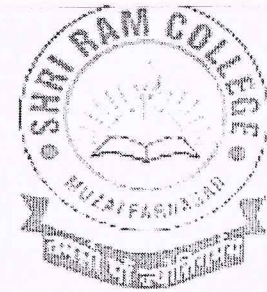
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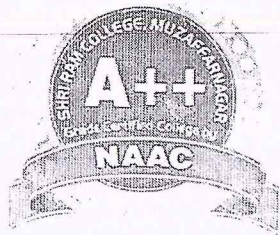
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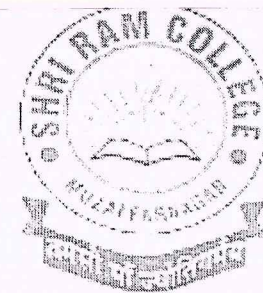
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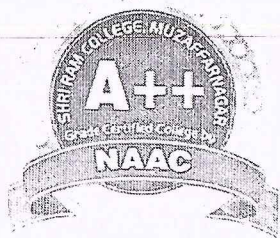
Co-ordinator
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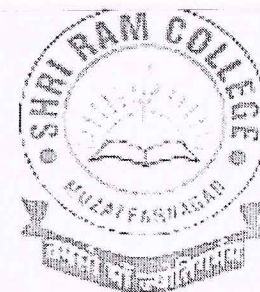
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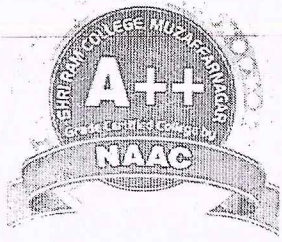
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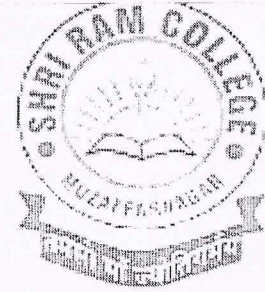
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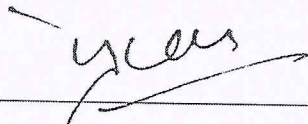


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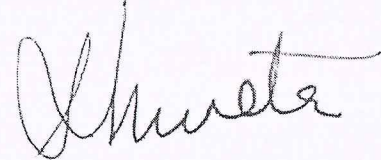
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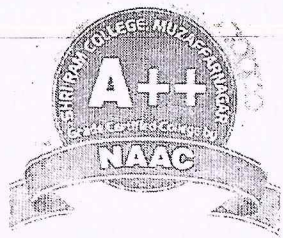
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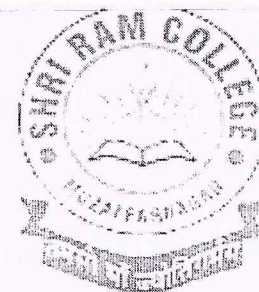

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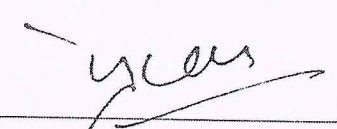
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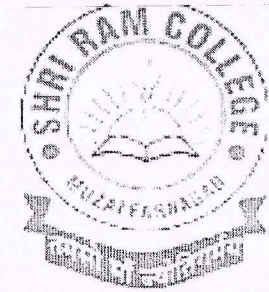

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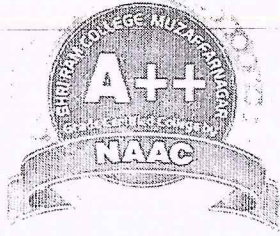
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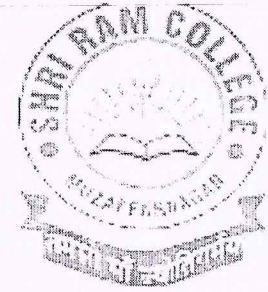
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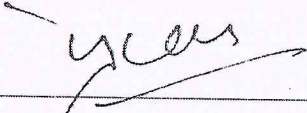


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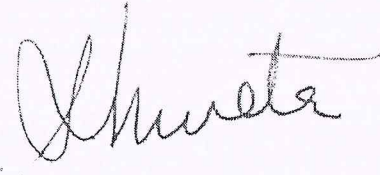
Varsha

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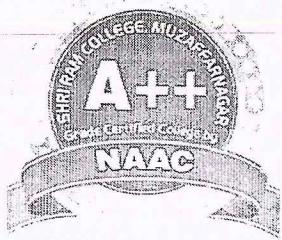
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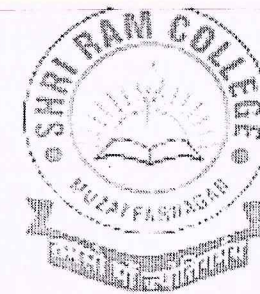

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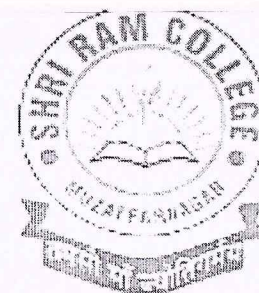
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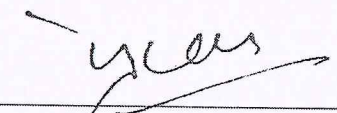
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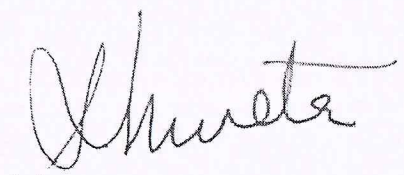
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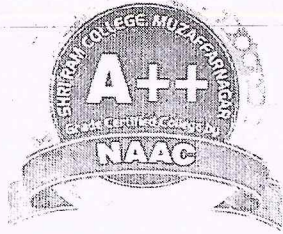
Divya Tyagi

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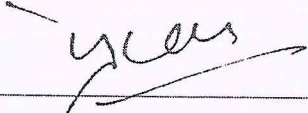


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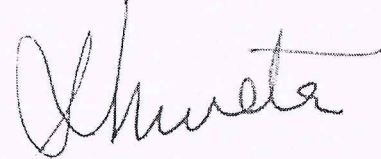
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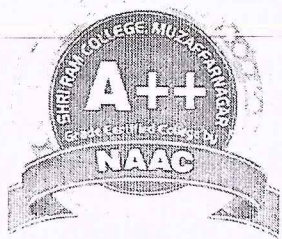
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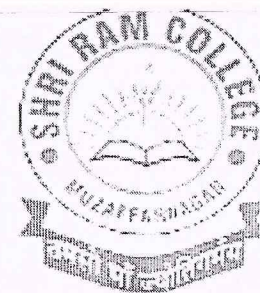

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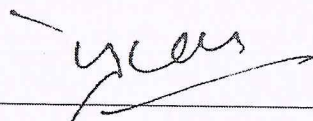
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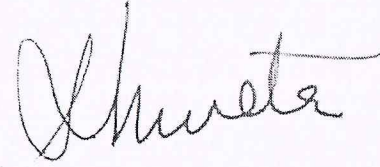
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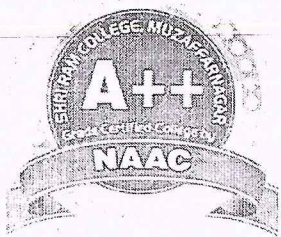
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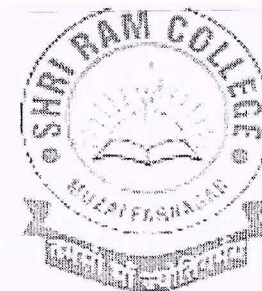

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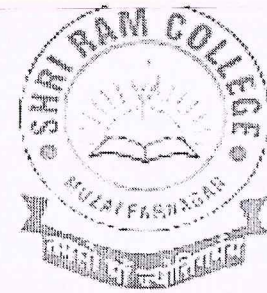
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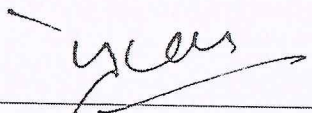
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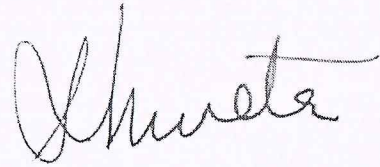
Khushi

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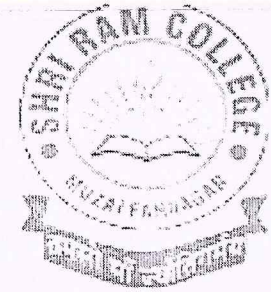
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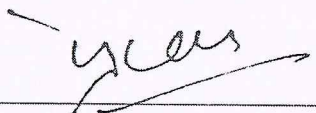
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Lubna Khan

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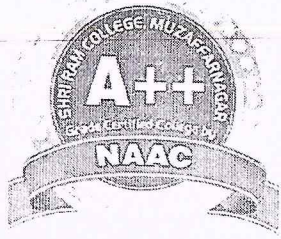

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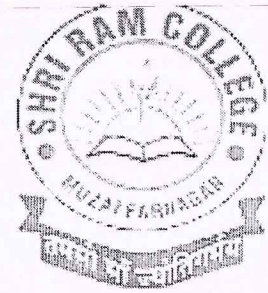
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Nandini

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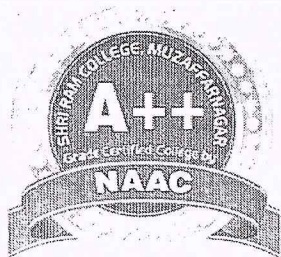
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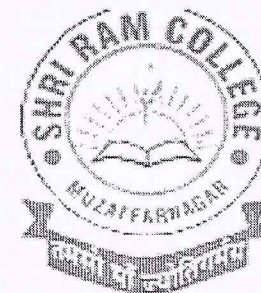
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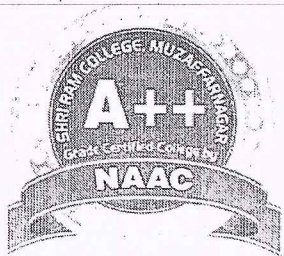
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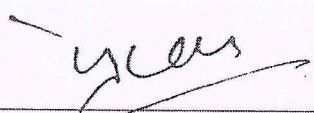
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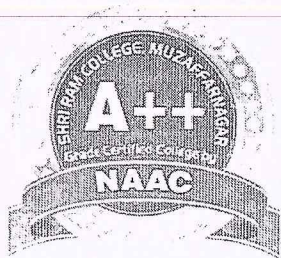
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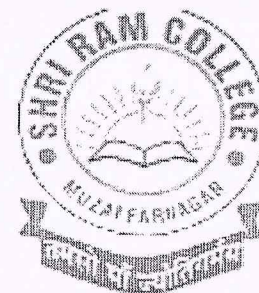

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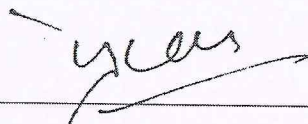
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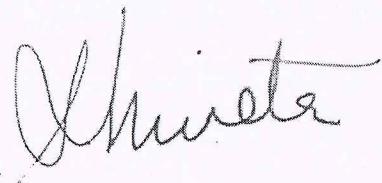
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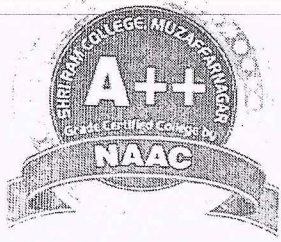
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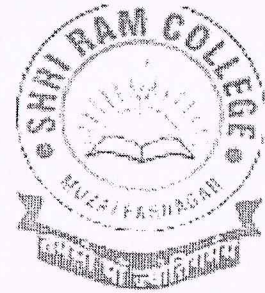
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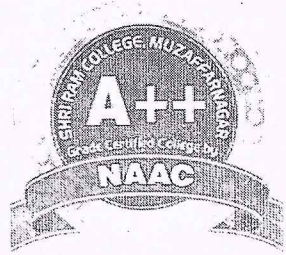
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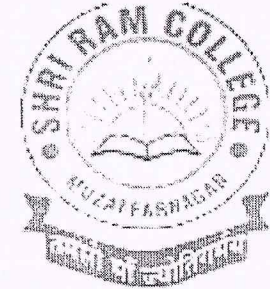

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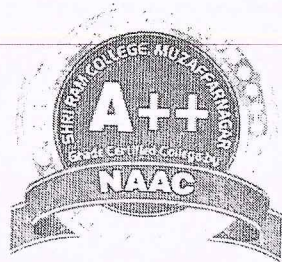
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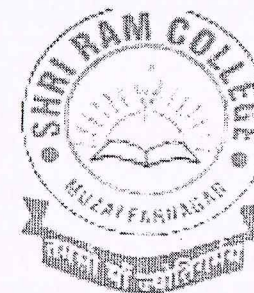
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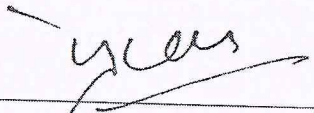
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Zainab Riyaz

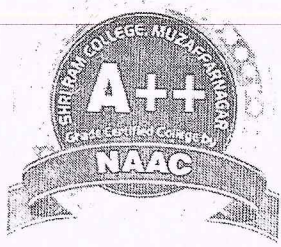
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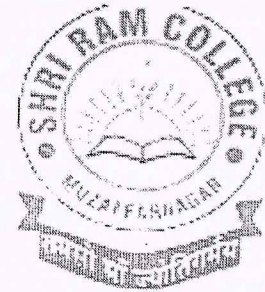

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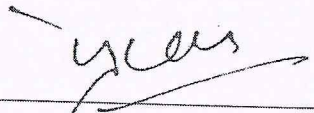


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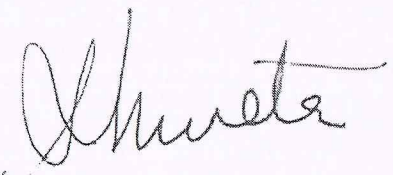
Alisha

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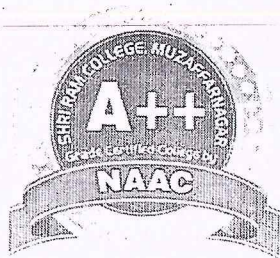
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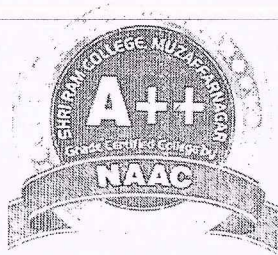
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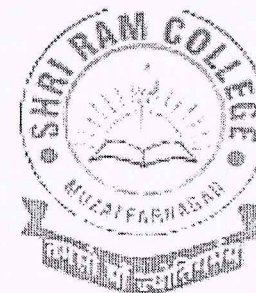
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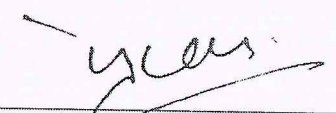
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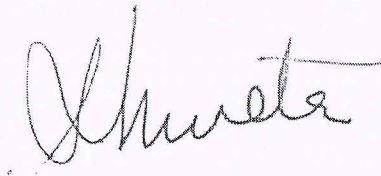
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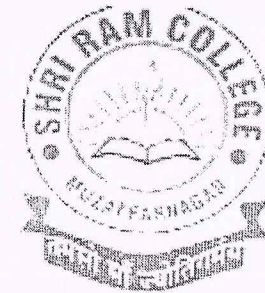

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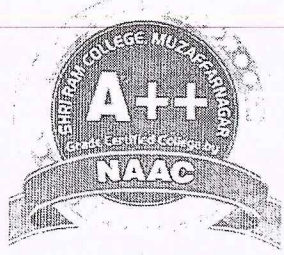
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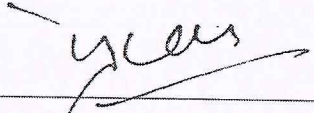
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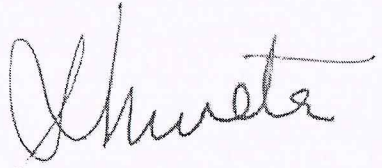
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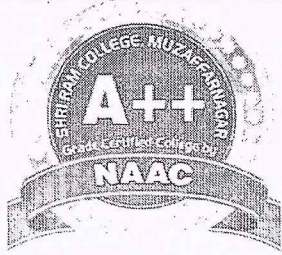
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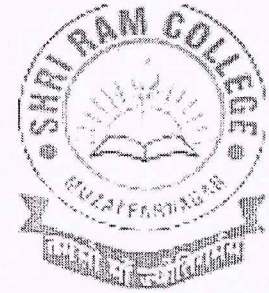

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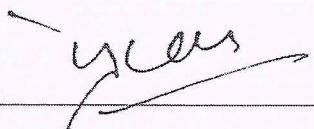
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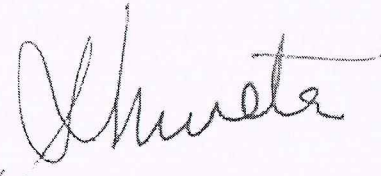
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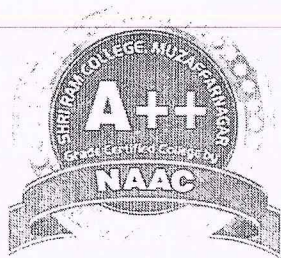
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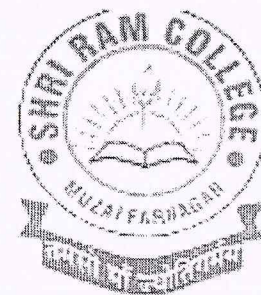

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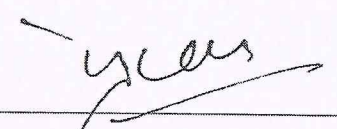
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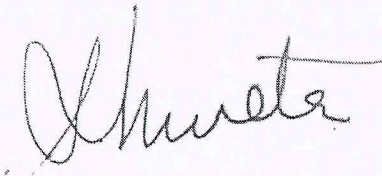
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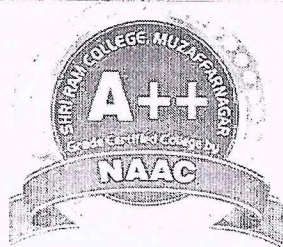
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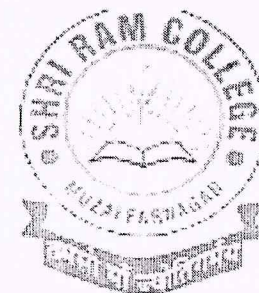

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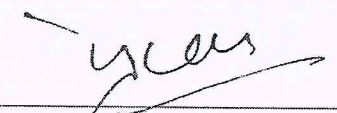
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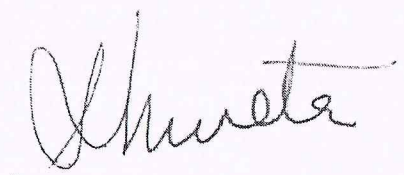
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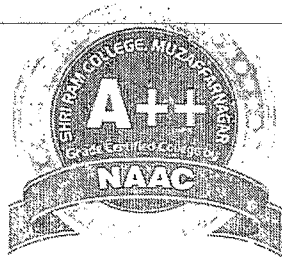
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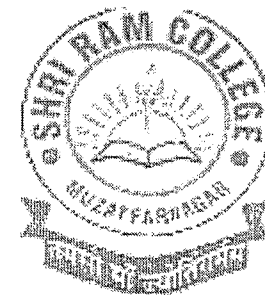

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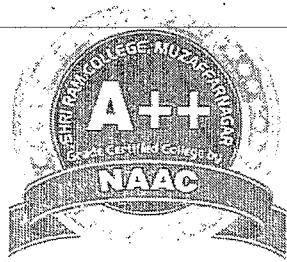
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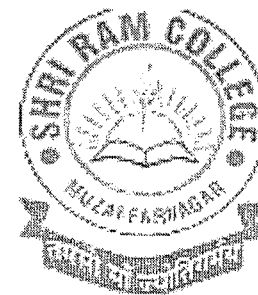
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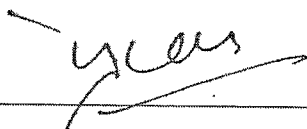


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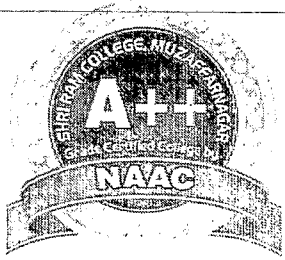
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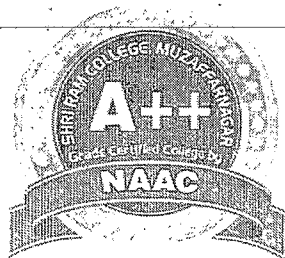
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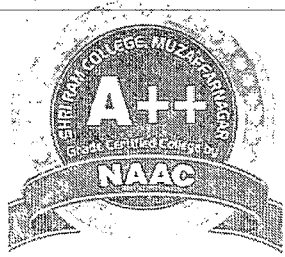
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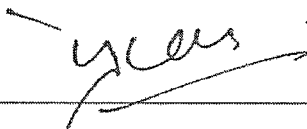


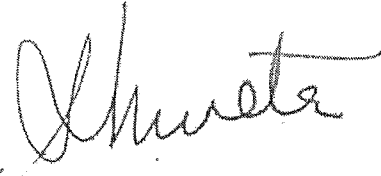
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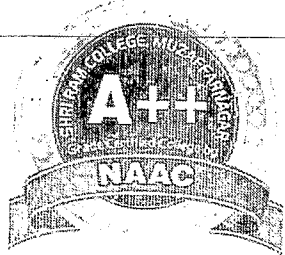
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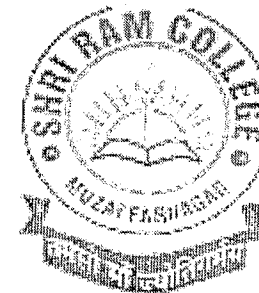
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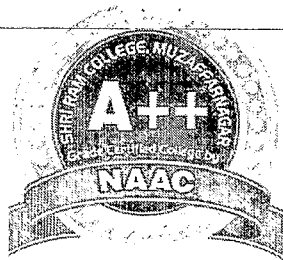
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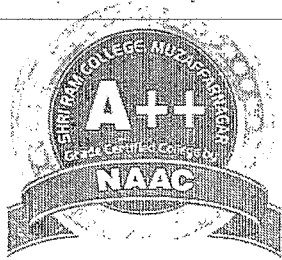
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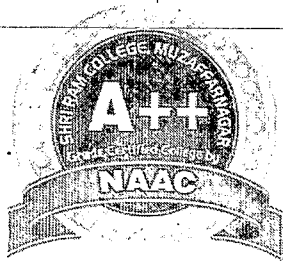
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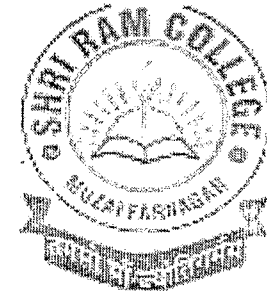
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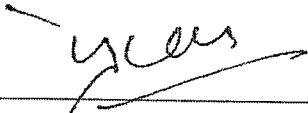


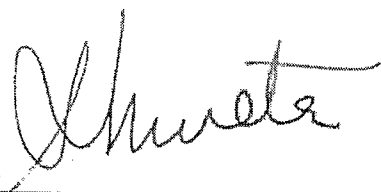
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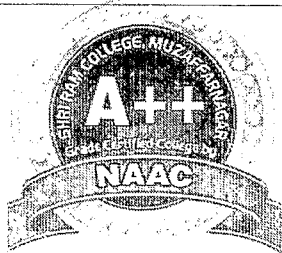
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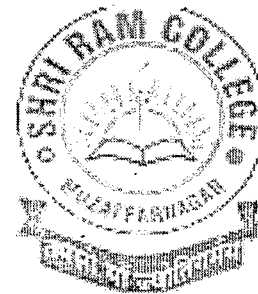
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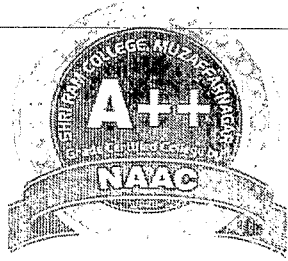
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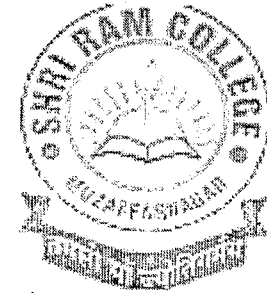
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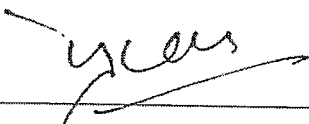


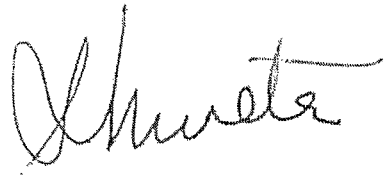
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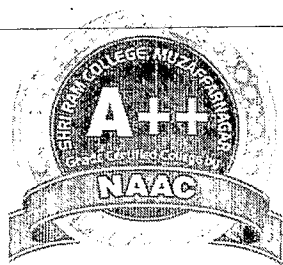
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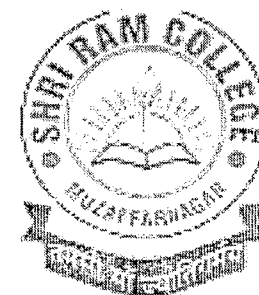
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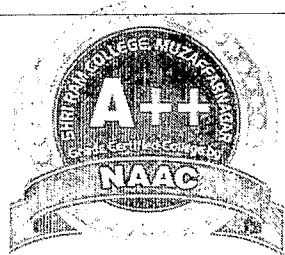
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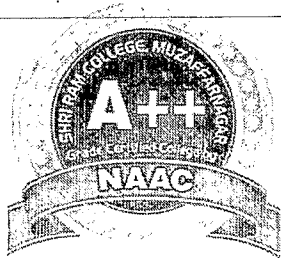
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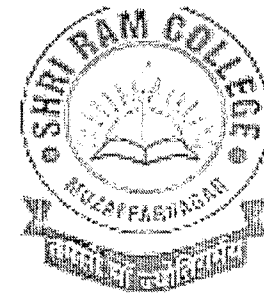
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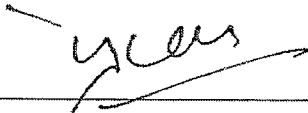


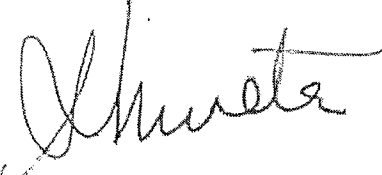
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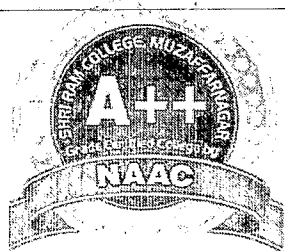
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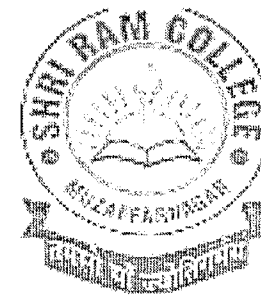
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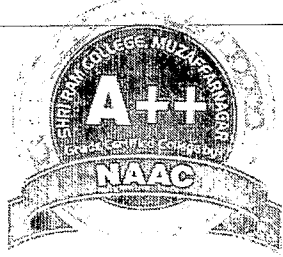
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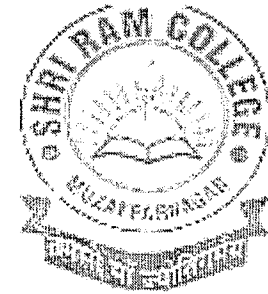
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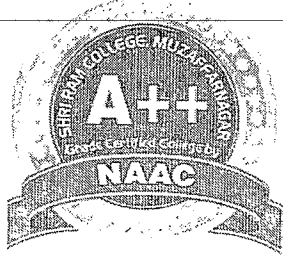
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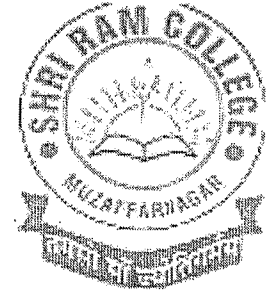
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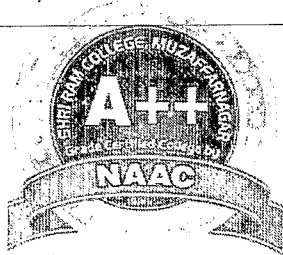
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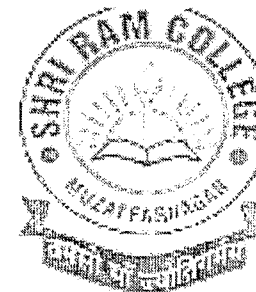
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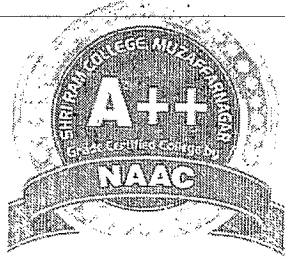
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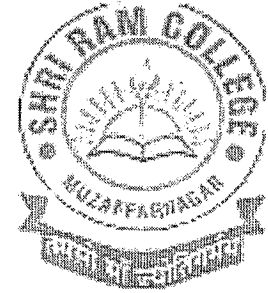
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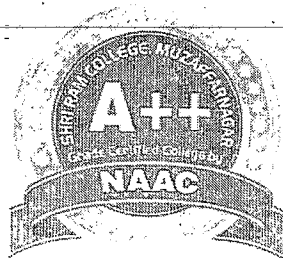
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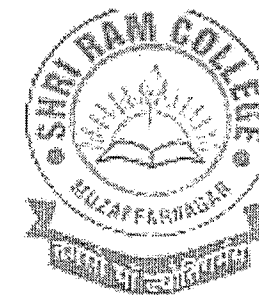
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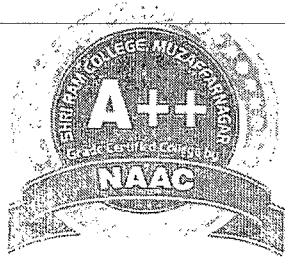
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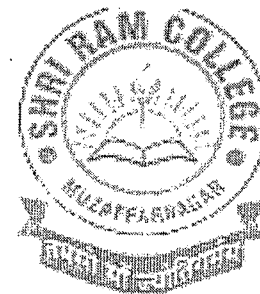
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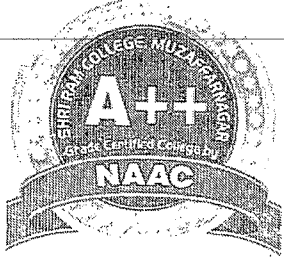
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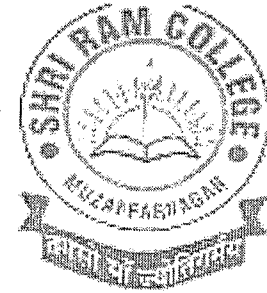
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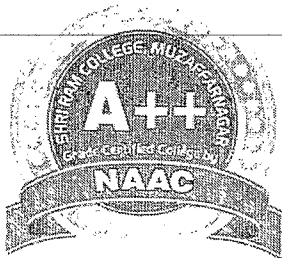
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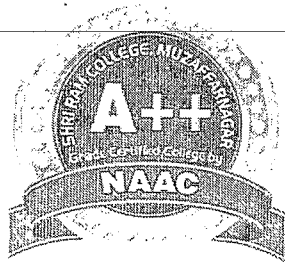
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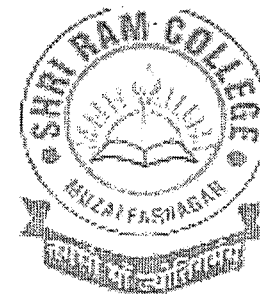
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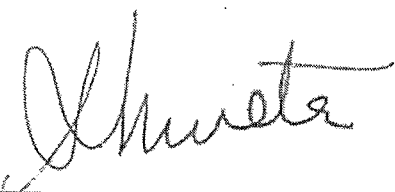
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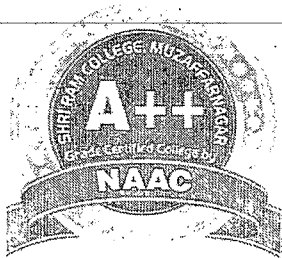
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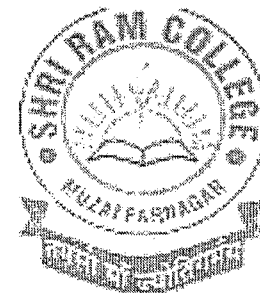
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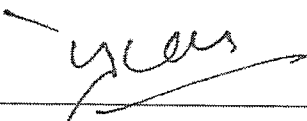


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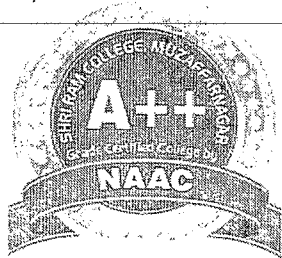
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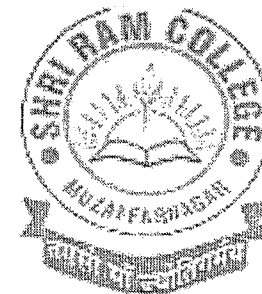
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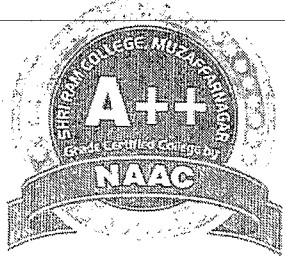
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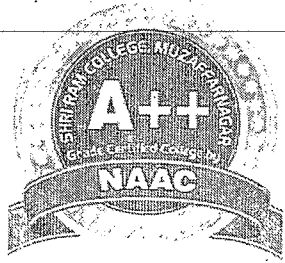
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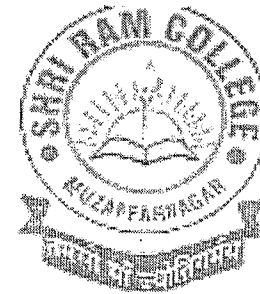
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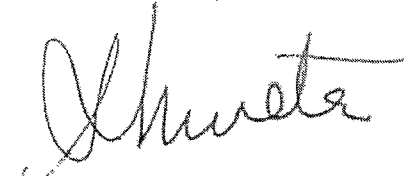
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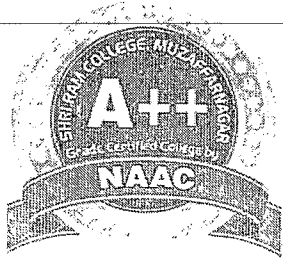
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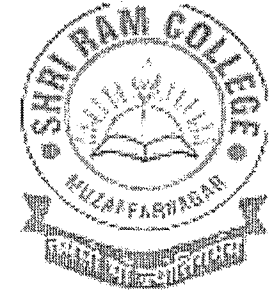
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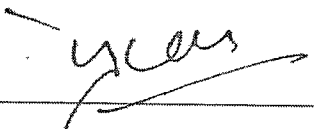


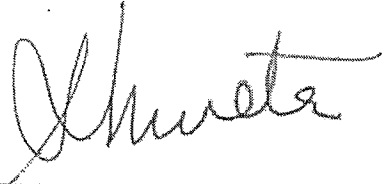
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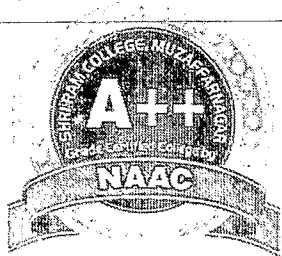
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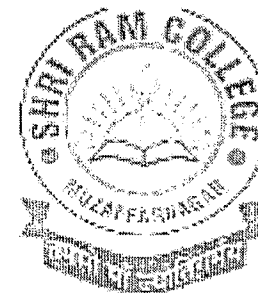
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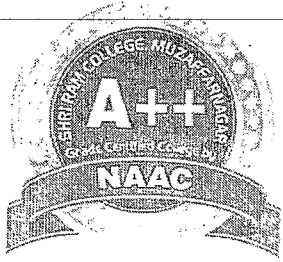
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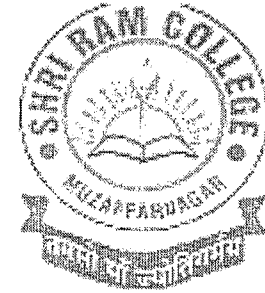
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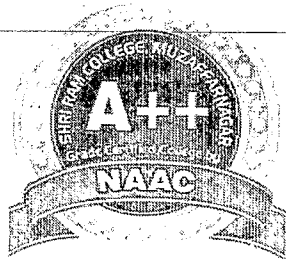
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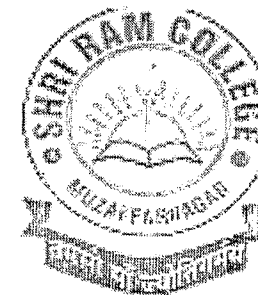
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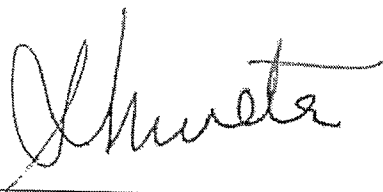
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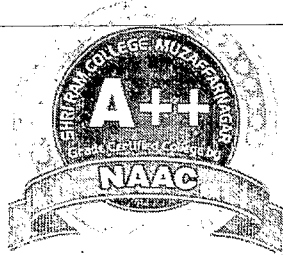
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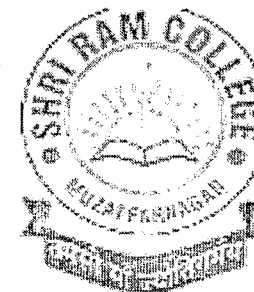
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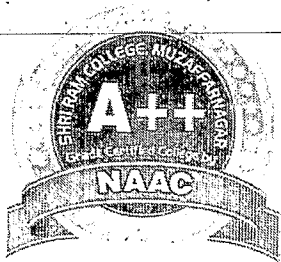
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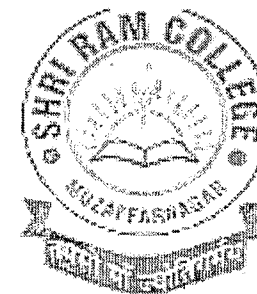
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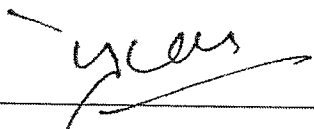


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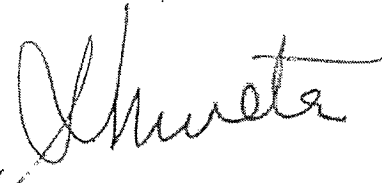
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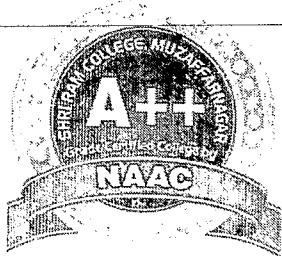
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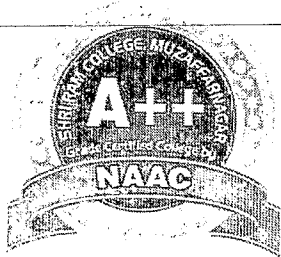
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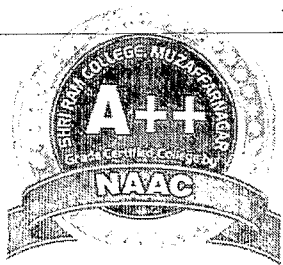
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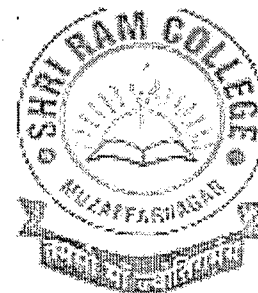
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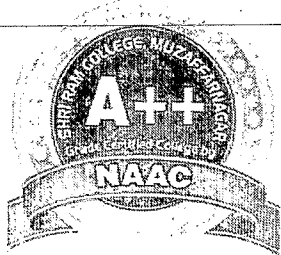
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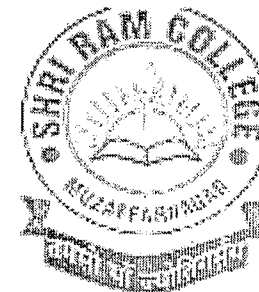
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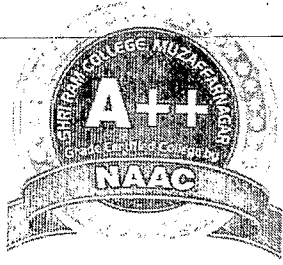
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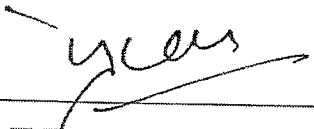


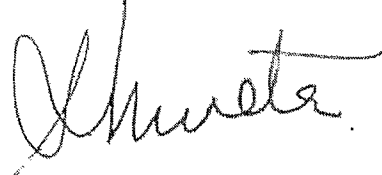
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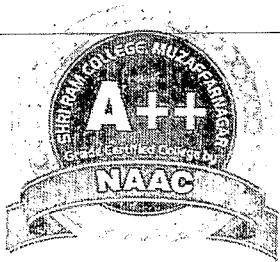
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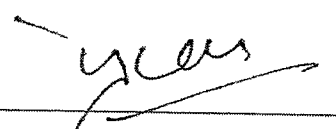


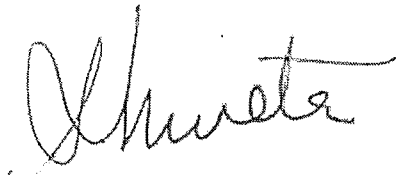
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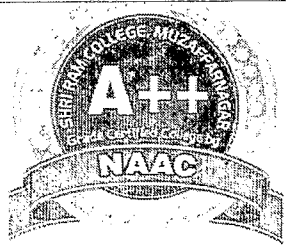
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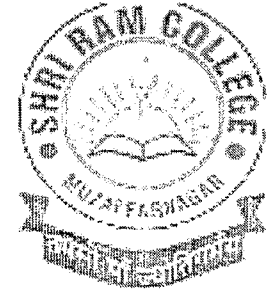
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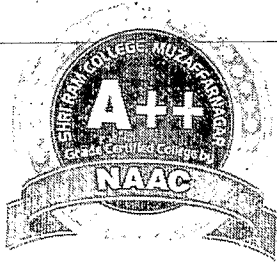
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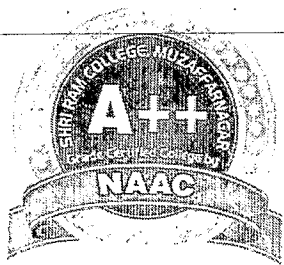
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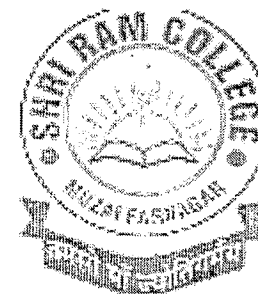
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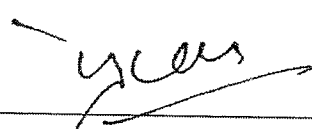


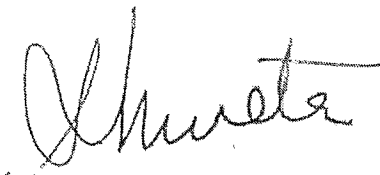
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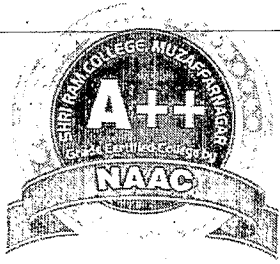
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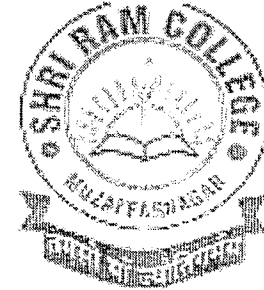
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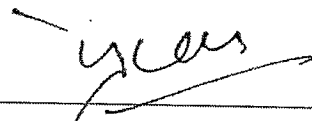


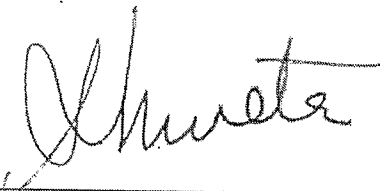
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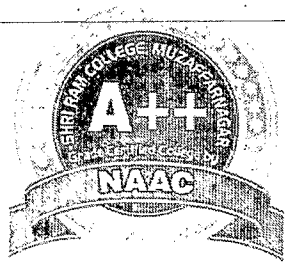
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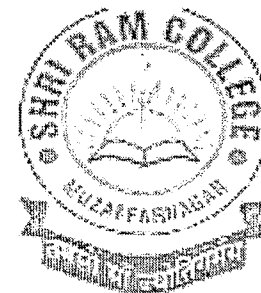
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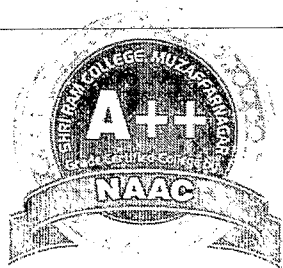
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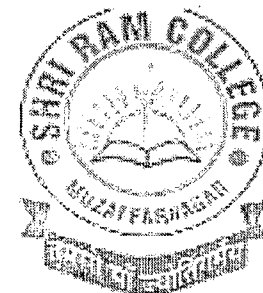
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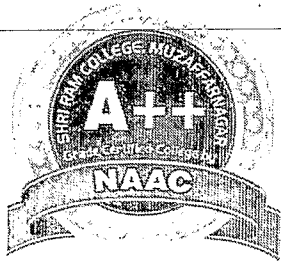
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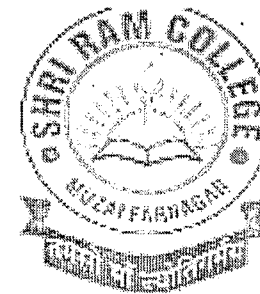
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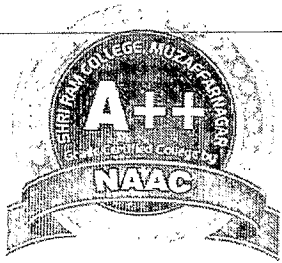
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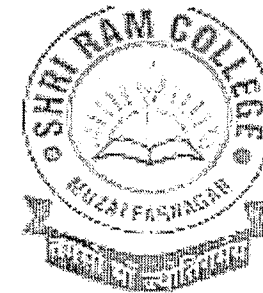
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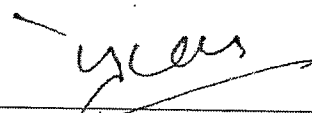


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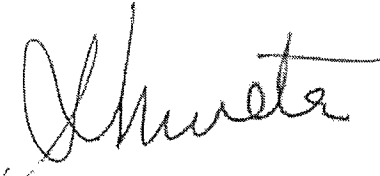
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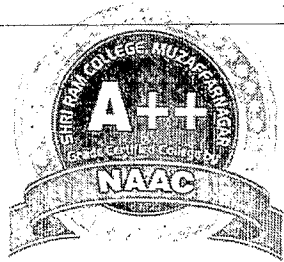
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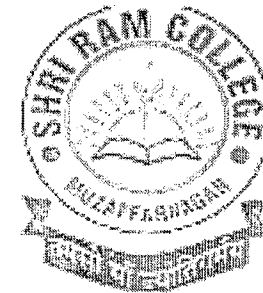
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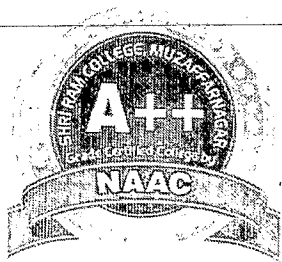
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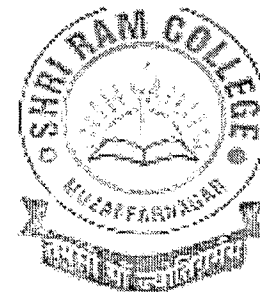
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Areeba

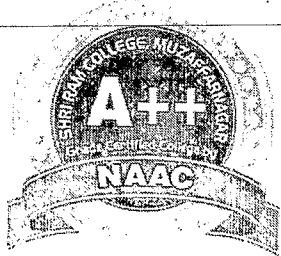
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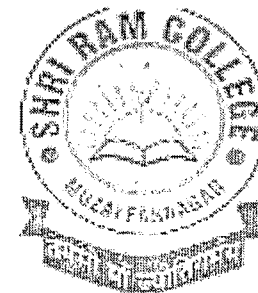
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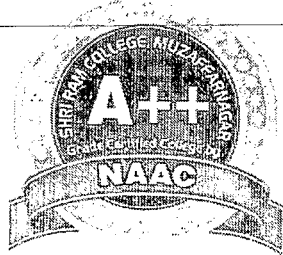
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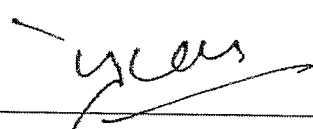


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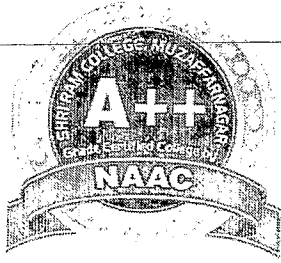
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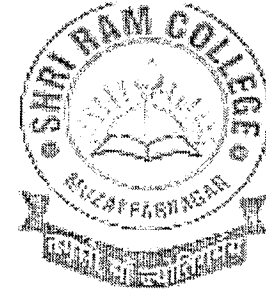
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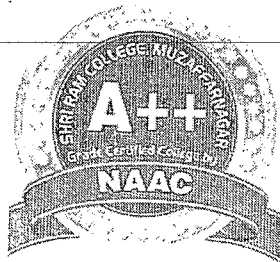
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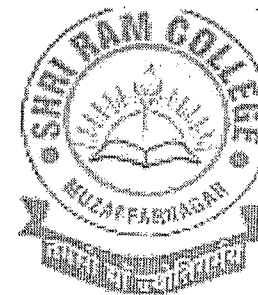
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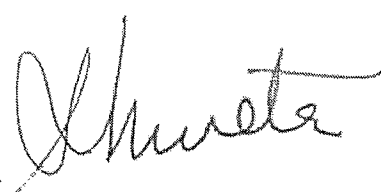
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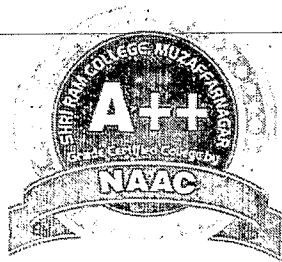
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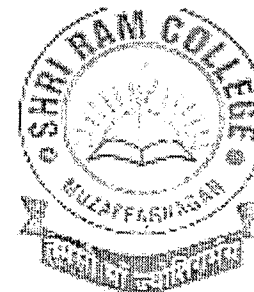
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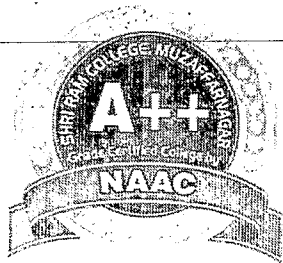
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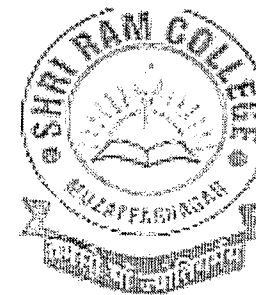
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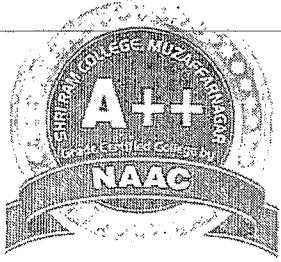
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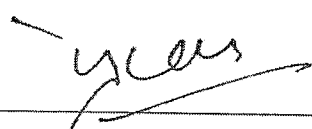


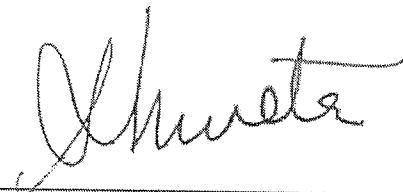
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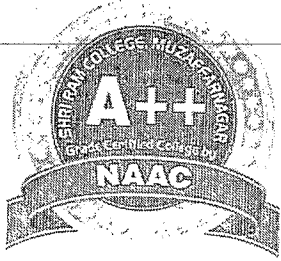
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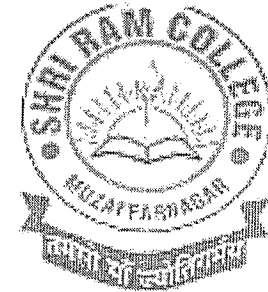
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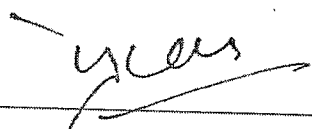


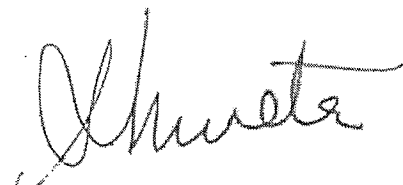
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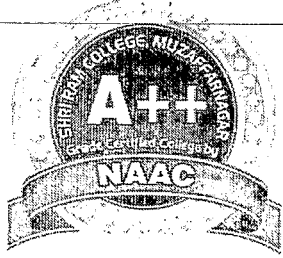
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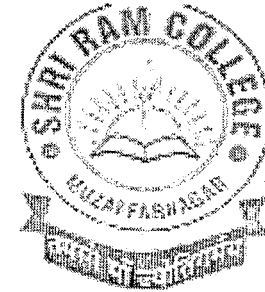
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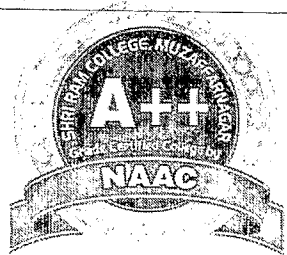
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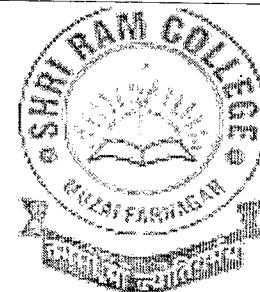
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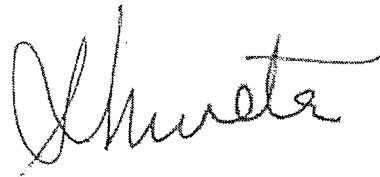
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