Regent Education & Research Foundation
Group of Institutions

R&D PROJECT PROPOSAL

1. Title of the project: Rainwater Harvesting
2. Name of the Applicant: Dr. Kaushik Dutta Roy (Associate Professor)
3. Name, Designation, and Affiliation of Principal Investigator: Dr. Kaushik Dutta Roy(Associate Professor)
4. Name, Designation, Affiliation of Co-PI (if any):1. Yuvaraj Mondal (AP) 2. Payel Chakraborty (Senior TA) 3. Chinmay Majumder (Senior TA)
5. Collaborating Institute (if any):NA
6. Broad Subject area of the Project Proposal : Civil Engineering
7. Abstract (Maximum 150 words):

Utilization of rainwater is an important eco-friendly approach –Suchagreenpracticeencouragedinthe formofa CommunityDevelopmentProgramcanfinditspopularitywhenitshowsthemanifoldbenefits. On the other hand, rainwater as well as run-off storm water stored in a planned way save the earth from soil erosion, In the RERFGI campus rainwater harvesting system has been installed on the roof of exactly 836.36 Sqm area of the rooftop. The rainwater is collected through a network of pipelinesand stored in the tank. There are two 5000 liters tanks on the campus rooftop where the roof runoffwater is stored. The roof runoff wateris allowed to use for washrooms, Gardening, and construction purposes. TotalAreaoftinshadeofrooftopinRERF 836.36m².Our civil Engineering departmental students were involved in this project

8. Total Duration (Months): 6 Months
9. Plan of Work: (500 characters):

- Have to Arrange a meeting with students and concerned faculties of the institute
- Selection of the rainwater catchment area
- Design of the different components related to rainwater collection, transportation, and plumbing arrangement for the project.
- Financial estimation for this project had been finalized and sent to the competent authority of the institute.

- After getting the financial approval work will be started.
- Involvement of interested students for the project

1st Quarter (November 2022 to February 2023): Estimation for the project willbe sent to the competent authority for getting approval.

2nd Quarter (March 2023 to June 2023): Procurement of different ancillary items i.e. four no of water tanks in different sizes, pipes, and accessories, and complete the installation process.

10. Do you need any Instruments/ facilities outside the Institute(List out within 500 characters):

Sl. No.	Name	Description
1.	Sachin Das	Plumber
2.	LitanSaha	Helper
3.	Md.RajaAhamed	Helper
4.		

11. Total estimated cost (In Rupees and in Words): 4,00,000/-

12. Summary of the budget:

QUOTATION					
To REGENT EDUCATION & RESEARCH FOUNDATION BARA KANTHALIA, BARRACKPORE Site:- BARA KANTHALIA, BARRACKPORE		OUR REF.:- DATE : YOUR REF.:- DATE :		SS/Q-21/2023-24 05-07-2023 What's app 05-07-2023	
SL.No.	MATERIALS DESCRIPTION	QTY.	UNIT	NET RATE	AMOUNT
1	5000 Ltr. (Four Layer Foam) Water Tank (Rel. Classic)	3	Pcs.	38000.00	114000.00
2	2000 Ltr. (Four Layer Foam) Water Tank (Rel. Classic)	5	Pcs.	15600.00	78000.00
3	1½" UPVC Tank Connector	14	Pcs.	67.00	938.00
4	1½" UPVC Ball Valve	8	Pcs.	390.00	3120.00
5	1½" UPVC Elbow	135	Pcs.	54.00	7290.00
6	1½" UPVC Tee	30	Pcs.	80.00	2400.00
7	1½" UPVC Passover	10	Pcs.	177.00	1770.00
8	1½" UPVC China Clamp	180	Pcs.	11.00	1980.00
9	1½" UPVC 45° Elbow	18	Ft.	42.00	756.00
10	1½" UPVC Socket	98	Pcs.	31.00	3038.00
11	1½" X 1" UPVC Reduceing Socket	35	Pcs.	32.00	1120.00

12	1½" X 1¼" UPVC Reduceing Socket	8	Pcs.	33.00	264.00
13	1½" X 1" UPVC Reduceing Elbow	30	Pcs.	69.00	2070.00
14	1½" X 1" UPVC Reduceing tee	25	Pcs.	57.00	1425.00
15	1½" UPVC End Cap	12	Pcs.	22.00	264.00
16	1½" UPVC Pipe	950	Ft.	49.00	46550.00
17	1½" PVC Ball Cock	10	Pcs.	905.00	9050.00
18	237ml UPVC Solvent Cement	38	Pcs.	225.00	8550.00
19	1" UPVC Pipe	760	Ft.	29.00	22040.00
20	1" UPVC Elbow	95	Pcs.	23.50	2232.50
21	1" UPVC Tee	28	Pcs.	32.00	896.00
22	1" UPVC Socket	50	Pcs.	19.00	950.00
23	1" X ¾" UPVC Reduceing Elbow	38	Pcs.	21.00	798.00
24	1" X ¾" UPVC Reduceing Tee	12	Pcs.	33.00	396.00
25	1" X ½" UPVC Reduceing Elbow (Metal)	24	Pcs.	90.00	2160.00
26	1" X ½" UPVC Reduceing Tee (Metal)	14	Pcs.	122.00	1708.00
27	1" UPVC Ball Valve	28	Pcs.	240.00	6720.00
28	1" UPVC China Clamp	210	Pcs.	8.50	1785.00
29	¾" UPVC Pipe	130	Ft.	20.00	2600.00
30	110mm X 10' PVC Pipe S/S	30	Pcs.	520.00	15600.00
31	110mm PVC End Cap	12	Pcs.	56.00	672.00
32	1" X 1" UPVC Elbow (Metal)	12	Pcs.	210.00	2520.00
33	Teflon Tape	48	Pcs.	25.00	1200.00
34	250gm. BOND SET (M-seal)	18	Pcs.	75.00	1350.00
35	1½" C.I. Hook	36	Pcs.	11.50	414.00
36	¾" UPVC Ball Valve	25	Pcs.	140.00	3500.00
37	¾" UPVC China Clamp	42	Pcs.	7.50	315.00
38	Tap	4	Pcs.	100.00	400.00
39	Tank connector	4	Pcs.	160	**640.00**
40	Service & Labour Charge				**47700.00**
	(including GST) SUB TOTAL AMOUNT(NET) :-				**399181.50**
	Discount on Labour Charge				**7700**
	Total Amount				**391481.50**

Items			
Year	**1stQuater**	**2ndQuater**	**Total**
A. Recurring: a. Remunerations b. Consumables c. Travel d. Othercosts	0	0	0
B. Non-recurring Permanent equipment/ publication/ software*	1,50,000	2,50,000	4,00000
Grand Total (A+B)	1,50,000	2,50,000	4,00000

Date..... 5th July, 2023
Place..... REGENT, Barrackpore

Kaushik Dutta Roy
(Name and signature of the Applicant)

REGENT EDUCATION & RESEARCH FOUNDATION
HOD
CIVIL

Shovik Sarkar
(Name and signature of the Head of the Department)

DR. RAJORSHI BANDYOPADHYAY, (Principal)
REGENT EDUCATION & RESEARCH FOUNDATION
Bara Kathalia, Sweli Telinipara
Barrckpore, Kolkata - 700121

PROJECT REPORT

ON

RAINWATER HARVESTING

REGENT EDUCATION AND RESEARCH FOUNDATION
GROUP OF INSTITUTIONS

Prepared by: CIVIL ENGINEERING DEPARTMENT

Dr.Kaushik Dutta Roy
Associate Professor
Principal Investigator
Department of Civil Engineering

Mr. Yuvaraj Mondal
Assistant Professor
Co- Principal Investigator
Department of Civil Engineering

Dr. Rajorshi Bandyopadhyay
Principal
REGENT EDUCATION & RESEARCH FOUNDATION
Bara Kathalia, Sweli Telinipara
Barrckpore, Kolkata - 700121.

DR. RAJORSHI BANDYOPADHYAY, (Principal)

Ms. Payel Chakraborty
Senior Technical Assistant
Co-Principal Investigator
Department of Civil Engineering

Mr. Chinmay Majumder
Senior Technical Assistant
Co- Principal Investigator
Department of Civil Engineering

Mr. Shouvik Sarkar
Assistant Professor
HOD
Department of Civil Engineering

HOD CIVIL

Name of Students Involved in the project

Name	Roll No
Soumi Das	26301321081
Naurin Sultana	26301321094
UJJAL BISWAS	26301321121
Brayen Sarkar	26301321033
NARAYAN KHANRA	26301322025
Abhijeet Banerjee	26301320012
Indrani Dutta	26301321091
Sujan Kumar Dey	26301321090

DR. RAJORSHI BANDYOPADHYAY, (Principal)
REGENT EDUCATION & RESEARCH FOUNDATION
Bara Kathalia, Sweli Telinipara
Barrckpore, Kolkata - 700121

Rain Water Harvesting Project in Regent Education and ResearchFoundation Group of Institutions

Introduction:

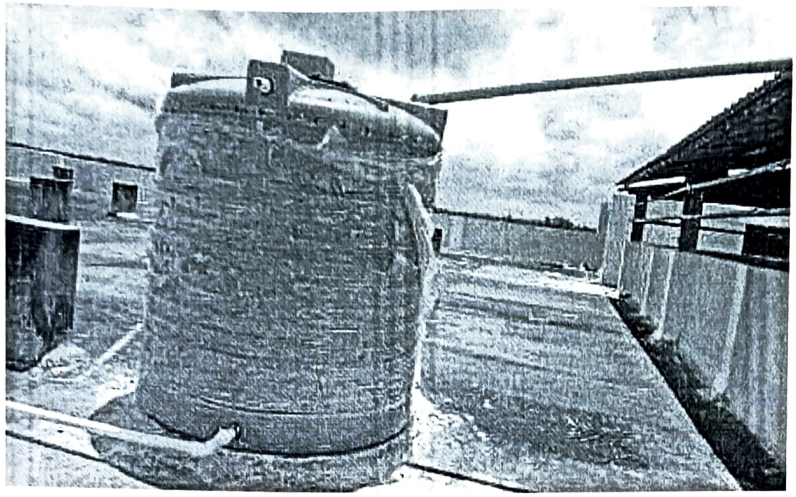
Rainwater harvesting is an important environment friendly approach – dubbed as a Green Practice which has double benefit in both keeping the groundwater table undisturbed and charging the aquifer. Such a green practice encouraged in form of Community Development Program can find its popularity when it shows the manifold benefits of, in one hand, bringing people together to collective thinking on 'green' approaches, innovating approaches to save earth by harping on their creative notes, achieving nobler feelings saving water for future; on the other hand, rainwater as well as run- off storm water stored in a planned way save the earth from soil erosion, flood; recharge the aquifers to give a shot in the arm to the decreasing groundwater table.

The increasing urbanization lead to concentrated population density at places resulting into uneven drawing of ground water. This is ensuing into draught and drying up of river beds at places where domestic and industrial use of water is rising. This places if shift focus towards using rainwater, the groundwater there may gradually fall back to its normal level thus ensuring the eco-balance not lost. The extensive and unplanned usage of groundwater not only disturbed the natural water table but also has made the groundwater contaminated and, in many a place, totally unfit for any use. The groundwater in these places required to be immediately left to revive. Collecting rainwater, and harvesting the storm water run-offs, in these places, surely would minimize the risk of the future population here.

Rainwater harvesting, besides being eco-friendly, is an economic practice as well. The cost of digging a catchment area even can be saved by a roof-top collection of rainwater. The freshwater canals or rain-fed natural ponds too can be used for harvesting. Sand-gravel filters for purifying rainwater is again something that can be easily arranged. The catchments and settlement tanks built in the area easily free the spot and the vicinity from the curse of flood or water logging, thus saving money of pumping outdirty muddy storm water. The presence of a water body in the region also reduces the ground heat and acts as a natural cooler.

The best part of the practice of rainwater harvesting, however, is that in one hand it is checking one from leaning towards using groundwater as rainwater is obtained in abundance in many countries; on the other hand, if remains unused or extra, this rainwater, collected in say natural ponds or evenin artificial tanks can pour back to the ground thus charging the natural aquifer to boost the groundwater level.

DR. RAJORSHI BANDYOPADHYAY, (Principal)
REGENT EDUCATION & RESEARCH FOUNDATION
Bara Kathalia, Sweli Telinipara
Barrckpore, Kolkata - 700121



Rain Water Collected in Tank

Objectives:

- To increase recharge of groundwater by capturing and storing rainwater, by rainwater harvesting from rooftop run-offs.
- To store the water for gardening & washing purpose.

Need for rainwater harvesting -

- Increasing water demand The rapid rise in human population has made optimum use of fresh water imperative.
- Urban water supply systems in particular are under tremendous pressure to meet the needs of the population as well as industry and large-scale construction.
- The increased need for water results in lower groundwater levels and depleted reservoirs.
- Consumption of polluted water creates health hazards.
- The use of rainwater is a useful alternative

Responsibilities towards protecting Nature -

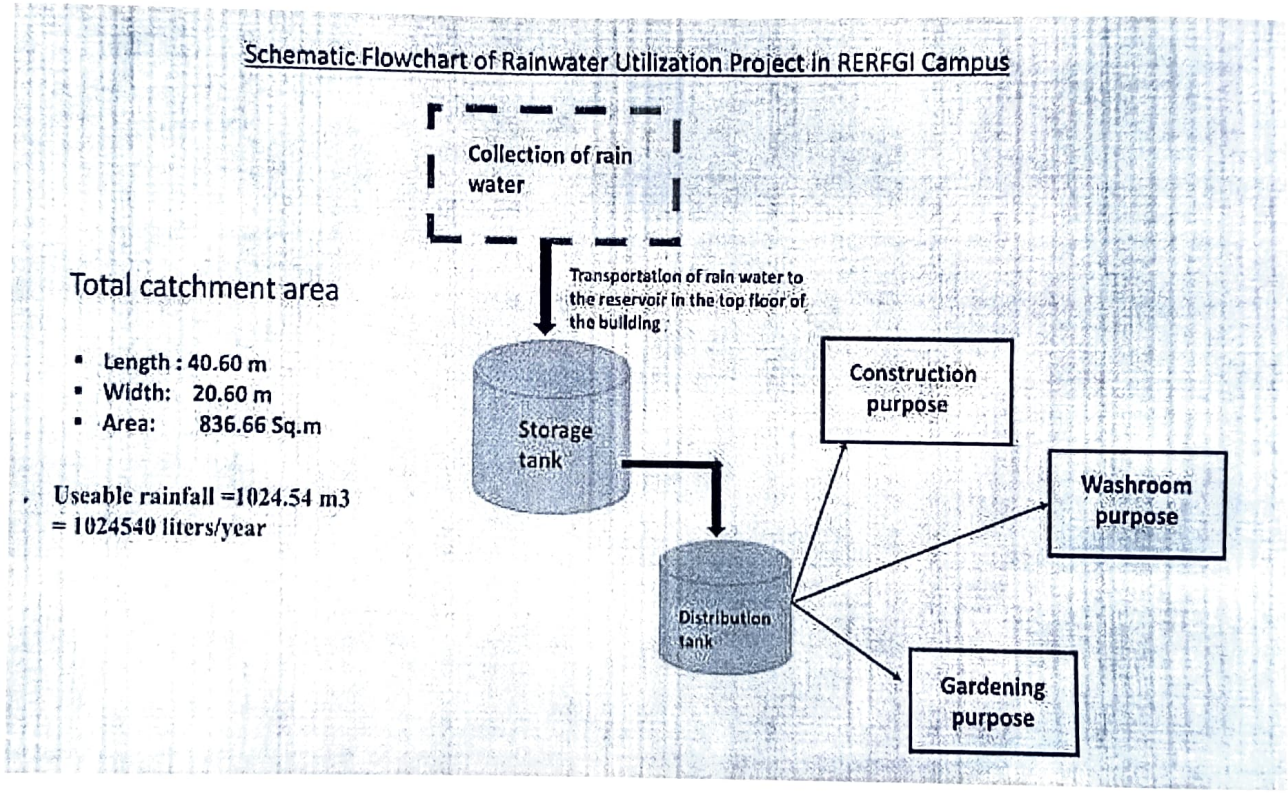
- Using more of rainwater helps to conserve & augment the storage of ground water
- It helps to arrest sea water intrusion in coastal areas
- It helps to avoid flood & water stagnation in urban areas
- Reduces water and electricity bills

DR. RAJORSHI BANDYOPADHYAY, (Principal)
REGENT EDUCATION & RESEARCH FOUNDATION
Bara Kathalia, Sweli Telinipara
Barrckpore, Kolkata - 700121

Advantage of collection and storage near the place of use -

- Collecting and storing water close to households improves the accessibility and convenience of water supplies.
- It costs less to collect rainwater than to exploit groundwater.
- Only traditional knowledge, skills and materials can be used to collect the water and no government technical assistance is required for repair and maintenance.
- Collecting rainwater is the only way of recharging water sources and revitalizing dry open wells

Typical details for Rain Water harvesting tanks and systems: -



DR. RAJORSHI BANDYOPADHYAY, (Principal)
REGENT EDUCATION & RESEARCH FOUNDATION
Bara Kathalia, Sweli Telinipara
Barrckpore, Kolkata - 700121.

Practice:

- In the RERFGI campus rainwater harvesting system has been installed on the roof of exactly 836.36 m^2 of the shade area of the rooftop. The rainwater is collected through a network of pipelines and stored in the tank. There are two 5000 liters tanks on the campus rooftop where the roof runoff water is stored. The roof runoff water is allowed to use for washrooms, Gardening, and construction purposes. Total Area of tin shade of rooftop in RERF 836.36 m^2.Our civil Engineering departmental students was involved in this project. A budget proposal was Rs 4,00,000 and subsequent approval of institute authority was Rs 337881.50 (Rupees Three lakhs thirty seven thousand eight hundred eighty one and paisa fifty)
-

Area m^2	Average Depth of Rainfall (m) *	volume of Runoff m^3	30 % losses	Total Quantity m^3
836.36	1.75	1463.63	439.09	1024.54

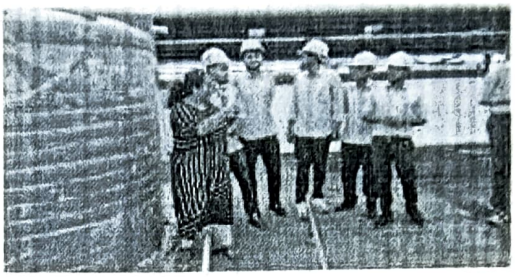
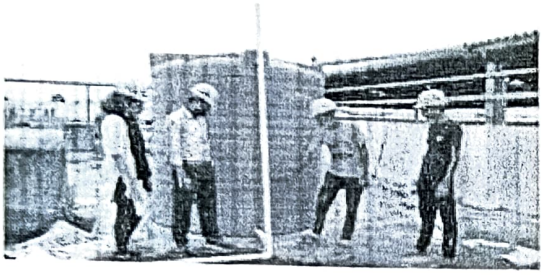
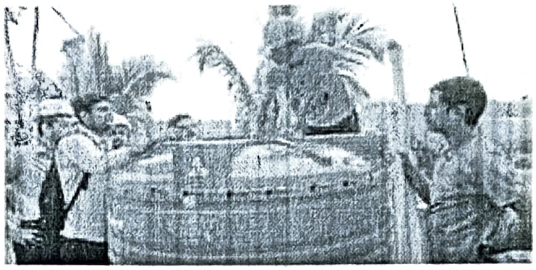
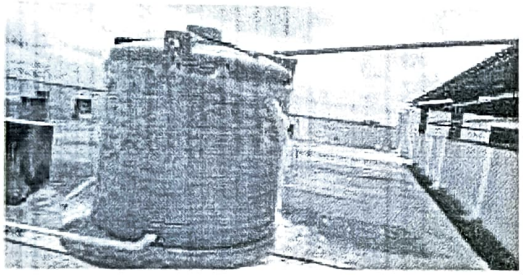
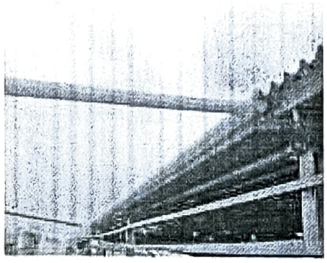
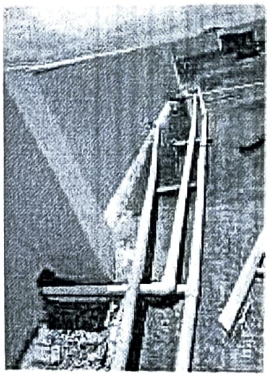
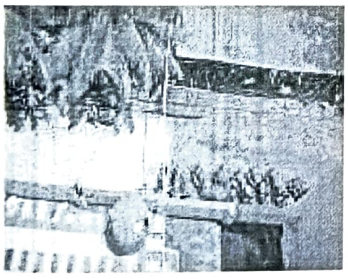
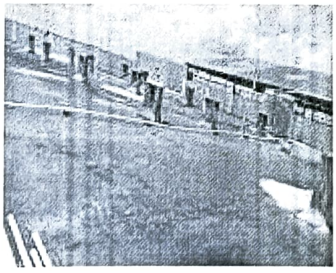
* Reference - (https://wbindustries.gov.in/Climate.html#:~:text=Most%20of%20the%20annual%20average,plains%20and%20western%20plateau%20region)

- **Useable rainfall =1024.54 m^3 = 1024540 liters/year**

DR. RAJORSHI BANDYOPADHYAY, (Principal)
REGENT EDUCATION & RESEARCH FOUNDATION
Bara Kathalia, Sweli Telinipara
Barrckpore, Kolkata - 700121.

REGENT EDUCATION & RESEARCH FOUNDATION
GROUP OF INSTITUTIONS

Photography of Rainwater Harvesting Project

DR. RAJORSHI BANDYOPADHYAY, (Principal)
REGENT EDUCATION & RESEARCH FOUNDATION
Bara Kathalia, Sweli Telinipara
Barrckpore, Kolkata - 700121

Materials Required For Rainwater Harvesting System and Cost

QUOTATION

To	OUR REF.:-	SS/Q-21/2023-24	
REGENT EDUCATION & RESEARCH FOUNDATION	DATE :	05-07-2023	
BARA KANTHALIA, BARRACKPORE	YOUR REF.:-	What's app	
Site:- BARA KANTHALIA, BARRACKPORE	DATE :	05-07-2023	

Sl.No.	MATERIALS DESCRIPTION	QTY.	UNIT	NET RATE	AMOUNT
1	5000 Ltr. (Four Layer Foam) Water Tank (Rel. Classic)	2	Pcs.	38000.00	76000.00
2	2000 Ltr. (Four Layer Foam) Water Tank (Rel. Classic)	4	Pcs.	15600.00	62400.00
3	1½" UPVC Tank Connector	14	Pcs.	67.00	938.00
4	1½" UPVC Ball Valve	8	Pcs.	390.00	3120.00
5	1½" UPVC Elbow	135	Pcs.	54.00	7290.00
6	1½" UPVC Tee	30	Pcs.	80.00	2400.00
7	1½" UPVC Passover	10	Pcs.	177.00	1770.00
8	1½" UPVC China Clamp	180	Pcs.	11.00	1980.00
9	1½" UPVC 45° Elbow	18	Ft.	42.00	756.00
10	1½" UPVC Socket	98	Pcs.	31.00	3038.00
11	1½" X 1" UPVC Reduceing Socket	35	Pcs.	32.00	1120.00
12	1½" X 1¼" UPVC Reduceing Socket	8	Pcs.	33.00	264.00
13	1½" X 1" UPVC Reduceing Elbow	30	Pcs.	69.00	2070.00
14	1½" X 1" UPVC Reduceing tee	25	Pcs.	57.00	1425.00
15	1½" UPVC End Cap	12	Pcs.	22.00	264.00
16	1½" UPVC Pipe	950	Ft.	49.00	46550.00
17	1½" PVC Ball Cock	10	Pcs.	905.00	9050.00
18	237ml UPVC Solvent Cement	38	Pcs.	225.00	8550.00
19	1" UPVC Pipe	760	Ft.	29.00	22040.00
20	1" UPVC Elbow	95	Pcs.	23.50	2232.50
21	1" UPVC Tee	28	Pcs.	32.00	896.00
22	1" UPVC Socket	50	Pcs.	19.00	950.00
23	1" X ¾" UPVC Reduceing Elbow	38	Pcs.	21.00	798.00
24	1" X ¾" UPVC Reduceing Tee	12	Pcs.	33.00	396.00
25	1" X ½" UPVC Reduceing Elbow (Metal)	24	Pcs.	90.00	2160.00
26	1" X ½" UPVC Reduceing Tee (Metal)	14	Pcs.	122.00	1708.00
27	1" UPVC Ball Valve	28	Pcs.	240.00	6720.00
28	1" UPVC China Clamp	210	Pcs.	8.50	1785.00
29	¾" UPVC Pipe	130	Ft.	20.00	2600.00
30	110mm X 10' PVC Pipe S/S	30	Pcs.	520.00	15600.00
31	110mm PVC End Cap	12	Pcs.	56.00	672.00
32	1" X 1" UPVC Elbow (Metal)	12	Pcs.	210.00	2520.00
33	Teflon Tape	48	Pcs.	25.00	1200.00
34	250gm. BOND SET (M-seal)	18	Pcs.	75.00	1350.00
35	1½" C.I. Hook	36	Pcs.	11.50	414.00
36	¾" UPVC Ball Valve	25	Pcs.	140.00	3500.00
37	¾" UPVC China Clamp	42	Pcs.	7.50	315.00
38	Tap	4	Pcs.	100.00	400.00
39	Tank connector	16	Pcs.	40.00	640.00
40	Service & Labour Charge				47000.00
	(including GST) SUB TOTAL AMOUNT(NET) :-				345581.50
	Discount on Labour Charge				7700
	Total Amount				337881.50

DR. RAJORSHI BANDYOPADHYAY (Principal)
REGENT EDUCATION & RESEARCH FOUNDATION
Bara Kathalia, Sweli Telinipara
Barrackpore, Kolkata - 700121

Informatics Publishing Limited
No. 194, R.V. Road, P.B. No. 400
Basavanagudi, Bangalore-560 004, India
Tel : +91-80-40387777 | Fax : +91-80-40387600
Email : info@informaticsglobal.com
CIN : U72200KA2006PLC040165 / GSTIN : 29AACCT4896Q1Z8
MSME-UAN : KR03E0010619 / PAN : AACCT4896Q
www.informaticsglobal.com

Quotation

IPL-QTN-2021-22-03105

Customer Name : Regent Education and Research Foundation	**Date :** 17-02-2022
Customer Address : Bara Kanthalia, Barrackpore P.O, Sewli Telini Para, North 24 Parganas Kolkata West Bengal, State Code: 19 PIN: 700121 India GSTIN: 19AABTR3825K2Z5	**Kind Attention :** The Librarian

Sr	Item	Description	HSN	Quantity	Rate	Amount
1	JST	J-Gate Science and Technology	998431	1.0	₹ 62,424.00	₹ 62,424.00
	Total			**1.0**		**₹ 62,424.00**

Total	**₹ 62,424.00**
Net Total	**₹ 62,424.00**
IGST @ 18%	**₹ 11,236.32**
Grand Total	**₹ 73,660.32**
Rounded Total	**₹ 73,660.00**

In Words: INR Seventy Three Thousand, Six Hundred And Sixty only.

Terms & Conditions:

- **Period of subscription:** 1st Apr 2022 to 31st Mar 2023.
- **Period of Content Coverage:** January 2001 – Current.
- **Updates:** Daily
- **Access/Delivery:** Internet - User ID password access or IP enabled access. If you have an internet server in your organization, please let us know its IP address to enable your server for access by all your users. This will eliminate the need for a separate password.
- **Payment/Order Registration:** Required in advance for activating the service. Order will be registered and processed for access within one week from the date of receiving order and payment.
- **Cancellation:** Order once registered cannot be cancelled. In the event of mid-term cancellation of order for any extraneous reasons whatsoever, the proportionate refund shall be limited to the prorated amount for the unserviced period, exclusive of taxes.
- **Copyright Consent:** J-Gate products and services are the copyright of Informatics (India) Limited, Bangalore. By subscribing to J-Gate products / services listed in this offer, the subscriber agrees to abide the copyright laws applicable to published information products and software in electronic media as per the Indian Copyright Act.
- **Payment:** Please make the payment through a demand draft/cheque drawn in favour of **INFORMATICS PUBLISHING LIMITED**, or through Bank Transfer Beneficiary: **INFORMATICS PUBLISHING LIMITED**, Bank & Branch: **CANARA BANK**, #96, South End Road, Basavanagudi, Bangalore - 560 004, Account no: **1173257000988**, Account Type: **Current Account**, IFSC/RTGS Code: **CNRB0001173**

DKBP
(An ISO 9001 :2015 Certified Company)

DK BOOKS & PERIODICALS

109/662, Ananda Vihar, Nuagaon Road, Sisupalgarh,
Bhubaneswar - 751002, Odisha, Tel : +91-9437859715
E-mail:dkbp.orissa@gmail.com / contact@dkbp.in, Web:-www.dkbp.in

RECEIPT NO.021

DATE: 15.05.2023

MONEY RECEIPT & ACKNOWLEDGEMENT

RECEIVED WITH THANKS FROM	: REGENT EDUCATION RESEARCH FOUNDATION, BARRACKPORE, KOLKATA
PAYMENT RECEIVED	: RS.68763.00, NEFT DT.13.05.2023
TOWARDS	: SUBSCRIPTION OF PRINT JOURNALS
SUBSCRIPTION PERIOD	: JANUARY 2023 – DECEMBER 2023
SALE TYPE	: INSTITUTIONAL
INVOICE NO.	: DKBP/INV/15.05.2023/23-24, DT.15.05.2023
ORDER NO.	: RECEIVED

FOR DK BOOKS & PERIODICALS,

(AUTHORITORY)
JOURNAL SUBSCRIPTION

GSTIN / UNIQUE ID : 21AEIPC8845B12Y

PAN NUMBER : AEIPC8845B

DKBP
(An ISO 9001 :2015 Certified Company)

DK BOOKS & PERIODICALS

109/662, Ananda Vihar, Nuagaon Road, Sisupalgarh,
Bhubaneswar - 751002, Odisha, Tel : +91-9437859715
E-mail:dkbp.orissa@gmail.com / contact@dkbp.in, Web:-www.dkbp.in

INVOICE NO. DKBP/INV/15.05.2023/23-24
DATE 15.05.2023

Bill To Address :

TO,
THE PRINCIPAL
REGENT EDUCATION RESEARCH FOUNDATION,
BARAKANTHALIA
PO - SEWLI TELINI PARA
BARRACKPORE
KOLKATA - 100121

Ship to address :

TO,
THE ASST. LIBRARIAN,
CENTRAL LIBRARY
RERF GROUP OF INSTITUTION
BARAKANTHALIA
PO - SEWLI TELINI PARA
BARRACKPORE
KOLKATA - 100121

Your Order Reference No: ORDER AND PAYMENT RECEIVED

SUBSCRIPTION FOR JAN - DEC 2023

Sl.No.	Title Name & Details	Frequency	Org. Curr.	Qty	Amt. In (Rs.)
1	INDIAN GEOTECHNICAL JOURNAL	06 NOS		1.00	4800.00
2	DIFFERENTIAL EQUATTIONS AND DYNAMICAL SYSTEMS	04 NOS		1.00	6500.00
3	JNL OF THE INST. OF ENGINEERS INDIA SERIES - A	04 NOS		1.00	7627.00
4	JNL OF THE INST. OF ENGINEERS INDIA SERIES - B	06 NOS		1.00	8105.00
5	JNL OF THE INST. OF ENGINEERS INDIA SERIES - C	06 NOS		1.00	8105.00
6	JNL OF THE INST. OF ENGINEERS INDIA SERIES - D	02 NOS		1.00	3851.00
7	JNL OF THE INST. OF ENGINEERS INDIA SERIES - E	02 NOS		1.00	3851.00
8	INTERNATIONAL JOURNAL OF MATERIALS SCIENCE AND ENGG	2 NOS.		1.00	3000.00
9	RESEARCH JNL OF ENGINEERING AND TECHNOLOGY	04 NOS		1.00	2000.00
10	JNL ON SOFT COMPUTING	4 NOS.		1.00	5000.00
11	INDIAN JNL OF PHYSICS	12 NOS		1.00	7923.00
12	JNL OF THE INDIAN INSTITUTE OF SCIENCE	4 NOS.		1.00	8001.00
				TOTAL	68763.00
				POSTAGE	0.00
				GRAND TOTAL	**68763.00**

RUPEES SIXTH EIGHT THOUSAND SEVEN HUNDRED SIXTY THREE

PAYMENT SHOULD BE MADE IN FAVOUR OF DK BOOKS & PERIODICALS, PAYABLE AT BHUBANESWAR.

For DK BOOKS & PERIODICALS

You may please transfer the subscription payment

RTGS / NEFT BANK TRANSFER DETAIL :
ACCOUNT NAME : DK BOOKS & PERIODICALS
BANK NAME : INDIAN BANK, TEMPLE MARG BRANCH, BBSR
IFSC CODE : IDIB000M154
ACCOUNT NO : 6304411094
INCOME TAX PAN NO : AEIPC8845B

(AUTHORIZED SIGNATORY)

DK BOOKS & PERIODICALS BHUBANESWAR

PAYMENT TERMS : FULL PAYMENT IN ADVANCE BY CHEQUE / DEMAND DRAFT / NEFT BANK TRANSFER.
DESPATCH : ALL THE PUBLISHED ISSUES WILL BE MAILED 2 TO 3 WEEKS ON RECEIPT OF PAYMENT. BALANCE ON PUBLICATION.
CLAIM POLICY : MISSING ISSUES WILL BE CLAIMED WITHIN 3 MONTHS OF EXPECTED MONTH OF PUBLICATION.
WE HEREBY CERTIFY THAT THE ABOVE PRICE CHARGED ARE CORRECT AND AS PER THE PUBLISHERS CATLOGUE AND LATEST PRICE LIST.

Regent Education & Research Foundation Group of Institutions

R&D PROJECT PROPOSAL

(To be filled by the applicant)

1. Title of the project: Frequency and temperature dependence of conductivity spectra of silver-phosphate glass nanocomposites.

2. Name of the Applicant: Dr. Dipankar Biswas

3. Name, Designation, Affiliation of Principal Investigator: Dr.Dipankar Biswas, Associate Professor, Electronics and Communication Engineering

4. Name, Designation, Affiliation of Co-PI (if any):NA

5. Collaborating Institute (if any): NA

6. Broad Subject area of the Project Proposal :Nano composite glasses with rare earth materials

7. Abstract (Maximum 150 words):The typical melt quenching procedure will be used to create a succession of glass nanocomposite systems with the composition $xAgI-(1-x)(0.5Ag_2O-0.5P_2O_5)$ for x = 0.1, 0.2, 0.3, and 0.4. The X-ray diffraction patterns of all glassy samples will show amorphous nature and crystallinity, superposed over broad peaks. FT-IR measurement will identify several sorts of bonds that exist in the current system. The sample's dc and ac conductivity will be computed using the AgI concentration. The activation energy values for dc conductivity and activation will be determined. Complex impedance graphs will reveal the lack of the grain boundary effect. With increasing AgI content, the production of the cation-electron pair is expected to obstruct the diffusive or hopping path, indicating a decrease in conductivity.

8. Total Duration (Months):6 months

9. Plan of Work: (500 characters):

   1st Year: Formation of sample by melt quenching method and analysing data through FT-IR, XRD method

   2nd Year: NA

   3rd Year: NA

10. Do you need any Instruments/ facilities outside the Institute(List out within 500 characters):

Sl. No.	Name	Description
1.	NA	NA

11. Total estimated cost (In Rupees and in Words): 30,000/- (Thirty Thousand Only)

12. Summary of the budget

Items	BUDGET (InRupees)			
Year	1st Year	2nd Year	3rd Year	Total
A. Recurring: a. Remunerations b. Consumables c. Travel d. Othercosts	NA	NA	NA	NA
B. Non-recurring Permanent equipment/ publication/software*	30,000	NA	NA	NA
Grand Total (A+B)	30,000	NA	NA	NA

Date 06/08/2022

Place Barrackpore

Dipankar Biswas

(Name and signature of the Applicant)

(Name and signature of the Head of the Department)

Passed for payment

(In Words) Ten Thousand only

Principal
RERI GI, Barrackpore

Bundesrepublik Deutschland

Urkunde

über die Eintragung des
Gebrauchsmusters Nr. 20 2022 104 505

Bezeichnung:
Ein System zur Synthese von Se50-XTe30Sn20Sbx-Chalkogenidglas

IPC:
C03B 19/09

Inhaber/Inhaberin:
Adhikari, Shuma, Dr., Imphal, Manipur, IN
Biswas, Dipankar, Dr., Kolkata, West Bengal, IN
Das, Anindya Sundar, Dr., Kolkata, West Bengal, IN
Kabi, Soumyajyoti, Dr., Kharagpur, West Bengal, IN
Mondal, Rittwick, Labpur, West Bengal, IN
Ningthemcha, Rajkumar Nanao, Imphal, Manipur, IN
Singh, Loitongbam Surajkumar, Dr., Imphal, Manipur, IN
Singh, Yumnam Bonney, Imphal East, Manipur, IN

Tag der Anmeldung:
08.08.2022

Tag der Eintragung:
22.08.2022

Die Präsidentin des Deutschen Patent- und Markenamts

Cornelia Rudloff-Schäffer

Cornelia Rudloff-Schäffer

München, 22.08.2022

DEUTSCHES PATENT- UND MARKENAMT

Die Voraussetzungen der Schutzfähigkeit werden bei der Eintragung eines Gebrauchsmusters nicht geprüft.
Den aktuellen Rechtsstand und Schutzumfang entnehmen Sie bitte dem DPMAregister unter www.dpma.de.

Regent Education & Research Foundation
Group of Institutions

R&D PROJECT PROPOSAL

(To be filled by the applicant)

1. Title of the project:Glass composition (Ag2O-MoO3-P2O5) to determine the effects of silver sulfide on electrical conductivity and dielectric relaxation
2. Name of the Applicants: Dr.DipankarBiswas, Puspendu Chandra Chandra, Aninda Das,DebtanuPatra, Bidyut Kumar Ghosh, PabitraMaji, ArpanMandal, Sabyasachi Mukherjee , Dr. Rahul KantiNath, AsheshRakshit
3. Name, Designation, Affiliation of Principal Investigator:Dr.DipankarBiswas, Associate professor, ECE Department, RERF
4. Name, Designation, Affiliation of Co-PI (if any):
5. Collaborating Institute (if any): NIT, Manipur, India
6. Broad Subject area of the Project Proposal (Ex. Electrical Engineering): Material Science
7. Abstract (Maximum 150 words):

The influence of Ag2S incorporation on the electrical and dielectric properties of the host Ag2O-MoO3-P2O5 glassy matrix has been systematically studied in the present work. By applying the well-known Archimedes principle, the density of the samples has been determined. The ionic property for all the as-prepared glassy systems has been explored methodically. The nearly identical obtained values of the crossover frequency and the activation energy for DC and AC conductivity suggest that the same mechanism is responsible for electrical conduction. For the purpose of inspecting the frequency and temperature dependent AC conductivity, the Almond-West formalism model has been used. The observed values of dielectric constant and dielectric loss are found to increase with the temperature rise and drop with rising frequency. The coinciding scaled complex electric modulus spectra suggest a non-Debye type dynamical relaxation mechanism, which also indicates that the relaxation mechanism is temperature independent but composition dependent.

8. Total Duration (Months): 6 months
9. Plan of Work: (500 characters):

1st Year:Glass systems with chemical compositions of xAg2S-(1-x)(0.30Ag2O-0.35MoO3–0.35P2O5) where x = 0.0–0.4 have been synthesized from reagent-grade chemicals Ag2O, MoO3, P2O5 and Ag2S by well-known melt-quenching technique. The suitable quantities of Ag2S, Ag2O, MoO3 and P2O5 powders are systematically assorted andcalcined for 1 h at 200 ◦C, then melted in the temperature range from 800 to 900 ◦C depending on chemical composition. The molten mass has been ultimately quenched between two heavily polished metal plates at room temperature after homogenization for 20 min. The thickness of the as-quenched semi-transparent glass samples is ~ 1–2 mm. The Archimedes principle has been deployed to determine the density of the as-prepared samples under study, with acetone as the immersion liquid. The measured density and molecular weight of the composition of the Ag2S-doped quaternary glass samples are used to compute the molar volumes. The FTIR spectra of the powder samples in the KBr matrix in the ratio of 1:100 have been recorded at room temperature using an FTIR spectrometer (SHIMADZU, model FTIR-8400S). X-ray diffraction (XRD) patterns are recorded using a Rigaku (TTRAX-III) X-ray diffractometer with CuKα radiation of 1.5418 Å to analyze the microstructure of as-quenched complex glassy systems. The scanning rate has been set at 4 ◦/min in steps of 0.02◦, while Bragg's angle (2θ) varies from 10◦ to 80◦ Silver paste has been used as an electrode to investigate conductivity using an LCR meter (QuadTech, model 7600) over a wide range of temperature and frequency range of 20 Hz–5 MHz. The experiments have been carried out in a liquid nitrogen cryostat with a temperature stability of ~ ± 0.1 K.

2nd Year:

3rd Year:

10. Do you need any Instruments/ facilities outside the Institute(List out within 500 characters):

Sl. No.	Name	Description
1.	FTIR spectrometer	SHIMADZU, model FTIR-8400S
2.	X-ray diffraction (XRD)	Rigaku (TTRAX-III)
3.	LCR meter	QuadTech, model 7600
4.		

11. Total estimated cost (In Rupees and in Words): 45000/- (Forty Five Thousands)

12. Summary of the budget

Items	**BUDGET** (InRupees)			
Year	**1st Year**	**2nd Year**	**3rd Year**	**Total**

A. Recurring: a. Remunerations b. Consumables c. Travel d. Othercosts	15000/-			
B. Non-recurring Permanent equipment/ publication/software*	30000/-			
Grand Total (A+B)	45000/-			

Date....10/8/2022.....
Place....Baruckpore.....

Dipankar Biswas

(Name and signature of the Applicant)

(Name and signature of the Head of the Department)

Passed for payment
(in Words).. Ten Thousands only.

Principal

Bundesrepublik Deutschland

Urkunde

über die Eintragung des Gebrauchsmusters Nr. 20 2022 106 386

Bezeichnung:
Glaszusammensetzung (Ag2O-MoO3-P2O5) zur Bestimmung der Auswirkungen von Silbersulfid auf die elektrische Leitfähigkeit und die dielektrische Relaxation

IPC:
C03C 3/16

Inhaber/Inhaberin:
Biswas, Dipankar, Dr., Kolkata, West Bengal, IN
Chandra, Puspendu Chandra, Hooghly, West Bengal, IN
Das, Aninda, Siliguri, West Bengal, IN
Patra, Debtanu, Howrah, West Bengal, IN
Ghosh, Bidyut Kumar, Medinipur, West Bengal, IN
Maji, Pabitra, Medinipur, West Bengal, IN
Mandal, Arpan, Murshidabad, West Bengal, IN
Mukherjee, Sabyasachi, Birbhum, West Bengal, IN
Nath, Rahul Kanti, Dharmanagar, West Bengal, IN
Rakshit, Ashes, Madarpur, West Bengal, IN

Tag der Anmeldung:
15.11.2022

Tag der Eintragung:
21.11.2022

Die Präsidentin des Deutschen Patent- und Markenamts

Cornelia Rudloff-Schäffer

Cornelia Rudloff-Schäffer

München, 21.11.2022

DEUTSCHES PATENT- UND MARKENAMT

Die Voraussetzungen der Schutzfähigkeit werden bei der Eintragung eines Gebrauchsmusters nicht geprüft.
Den aktuellen Rechtsstand und Schutzumfang entnehmen Sie bitte dem DPMAregister unter www.dpma.de.

Regent Education & Research Foundation
Group of Institutions

R&D PROJECT PROPOSAL

(To be filled by the applicant)

1. Title of the project:Development of an Artificial Intelligence Based Safer Transport System in Mountains
2. Name of the Applicants: Pooja Jain, Dr.SaikatGochhait, Prof. Swati Gandhi, SabyasachiMukherjee , Dr.Shilpa Mehta, Sandeepkandwal
3. Name, Designation, Affiliation of Principal Investigator:
4. Name, Designation, Affiliation of Co-PI (if any):
5. Collaborating Institute (if any):Lingaya's University, Faridabad, Haryana, India
6. Broad Subject area of the Project Proposal (Ex. Electrical Engineering): Mechanical Engineering
7. Abstract (Maximum 150 words):

Safety in transport systems is the foremost requirement. For which Cognizance is sought in right design initiatives such as thru' artificial intelligence (AI). In this work, using a sensor system and signal processors a tool was used to avoid road accident in hilly area. Sensors used to monitor each vehicle from designed standoff distance and buzzer to alert driver crossing from other side was the forte of development. Design and fabrication of trouble free driving using arduino road tracking was the prime objective of experimental set up. Ultrasonic sensors used to detect up to a distance to an object by at a specific frequency to the target by measuring the time between the emission and reception.

8. Total Duration (Months): 6 months
9. Plan of Work: (500 characters):

1st Year:In nature, signals can take the form of any action by one organism able to be perceived by other organisms, ranging from the release of chemicals by plants to alert nearby plants of the same type of a predator, to sounds or motions made by animals to alert other animals of the presence of danger or of food. Signalling occurs in organisms all the way down to the cellular level, with cell signalling. Signalling, in evolutionary biology, proposes that a substantial driver for evolution is the ability for animals to communicate with each other by developing ways of signalling. In human engineering, signals are typically provided by a sensor, and often theoriginal form of a signal is converted to another form of energy

using a transducer. For example, a microphone converts an acoustic signal to a voltage waveform, and a speaker does the reverse.

After sensing the signal by the ultra-sonic sensors. It gives the signal to the signal pole and then a red signal is displayed on the signal pole with a buzzer sound to alert the vehicle driver to stop. After the vehicle coming from the opposite direction, when it passes the signal pole it gives the green signal to pass the vehicle freely. This signal system we used in this project .Then it is easy to recognize and there is a chance to control the vehicle. A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke. A piezoelectric buzzer/beeper also depends on acoustic cavity resonance or Helmholtz resonance to produce an audible beep These are the buzzer we used in this project Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, which are also used for loading programs from personal computers. The microcontrollers are typically programmed using a dialect of features from the programming languages C and C++. In addition to using traditional compiler tool chains, the Arduino project provides an integrated developmentenvironment (IDE) based on the Processing language project.

2nd Year:

3rd Year:

10. Do you need any Instruments/ facilities outside the Institute(List out within 500 characters): NA

Sl. No.	Name	Description
1.		
2.		
3.		
4.		

11. Total estimated cost (In Rupees and in Words): 30000/- (Thirty Thousands)
12. Summary of the budget

Items	**BUDGET** (InRupees)			
Year	**1st Year**	**2nd Year**	**3rd Year**	**Total**

A. Recurring: a. Remunerations b. Consumables c. Travel d. Othercosts	10000/-			
B. Non-recurring Permanent equipment/ publication/software*	20000/-			
Grand Total (A+B)	30000/-			

Date 03/08/2022

Place Barrackpore

(Name and signature of the Applicant)

(Name and signature of the Head of the Department)

Passed for payment

(In Words) Ten Thousands only

Principal
RGFGI, Barrackpore

ORIGINAL

मूल/No : 120408

सत्यमेव जयते

भारत सरकार
GOVERNMENT OF INDIA
पेटेंट कार्यालय
THE PATENT OFFICE
डिजाइन के पंजीकरण का प्रमाणपत्र
CERTIFICATE OF REGISTRATION OF DESIGN

डिजाइन सं. / Design No.	:	367798-001
तारीख / Date	:	16/07/2022
पारस्परिकता तारीख / Reciprocity Date*	:	
देश / Country	:	

प्रमाणित किया जाता है कि संलग्न प्रति में वर्णित डिजाइन जो **ROAD SAFETY INDICATOR DEVICE** से संबंधित है, का पंजीकरण, श्रेणी **10-06** में 1.Pooja Jain 2. Dr. Saikat Gochhait 3.Prof. Swati Gandhi 4.Sabyasachi Mukherjee 5.Dr. Shilpa Mehta 6.Sandeep Kandwal के नाम में उपर्युक्त संख्या और तारीख में कर लिया गया है।

Certified that the design of which a copy is annexed hereto has been registered as of the number and date given above in class **10-06** in respect of the application of such design to **ROAD SAFETY INDICATOR DEVICE** in the name of 1.Pooja Jain 2. Dr. Saikat Gochhait 3.Prof. Swati Gandhi 4.Sabyasachi Mukherjee 5.Dr. Shilpa Mehta 6.Sandeep Kandwal.

डिजाइन अधिनियम, 2000 तथा डिजाइन नियम, 2001 के अध्यधीन प्रावधानों के अनुसरण में।

In pursuance of and subject to the provisions of the Designs Act, 2000 and the Designs Rules, 2001.

निर्गमन की तारीख/Date of Issue : 16/12/2022

महानियंत्रक पेटेंट डिजाइन और व्यापार चिह्न
Controller General of Patents, Designs and Trade Marks

पारस्परिकता तारीख (यदि कोई हो) जिसकी अनुमति देश के नाम पर की गई है। डिजाइन का सत्त्वाधिकार पंजीकरण की तारीख से दस वर्षों के लिए होगा जिसका विस्तार, अधिनियम एवं नियम के निबंधनों के अधीन, पाँच वर्षों की अतिरिक्त अवधि के लिए किया जा सकेगा। इस प्रमाण पत्र का उपयोग विधिक कार्यवाहियों अथवा विदेश में पंजीकरण प्राप्त करने के लिए नहीं हो सकता है।

*The reciprocity date (if any) which has been allowed and the name of the country.Copyright in the design will subsist for ten years from the date of Registration, and may under the terms of the Act and Rules, be extended for a further period of five years.This Certificate is not for use in legal proceedings or for obtaining registration abroad.