



**Presentation of Annual Progress
Report
(2020-2021)**

under

DBT Star College Scheme

**Sougata Sarkar
Department of Chemistry
RKMVC College**

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Titles
✓ New practicals introduced in the Department of Chemistry
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New Practicals

Name of the Experiment	Paper	Semester
Determination of heat of neutralization of a strong acid by a strong base	C - II (LAB)	UG Semester - 1
Determination of heat of solution of oxalic acid from solubility measurement	C - II (LAB)	UG Semester - 1
Determination of K_{eq} for $KI + I_2 = KI_3$, using partition coefficient between water and CCl_4	C - V (LAB)	UG Semester - 3
Effect of ionic strength on the rate of Persulphate – Iodide [$K_2S_2O_8 + KI$] reaction	C – X (LAB)	UG Semester - 4
pH-metric titration of acid (mono- and di-basic) against strong base (say, NaOH)	C – X (LAB)	UG Semester - 4
Determination of Critical Micelle Concentration (CMC) of a surfactant from surface tension measurements	C – XIV (LAB)	UG Semester - 6
Determination of pH of unknown buffer, spectrophotometrically	C – XIV (LAB)	UG Semester - 6
Spectrophotometric determination of CMC of a surfactant	C – XIV (LAB)	UG Semester - 6

New Practicals

Name of the Experiment	Paper	Semester
Synthesis and spectroscopic characterizations of Cis and trans $K[Cr(C_2O_4)_2(H_2O)_2]$	C - VIII (LAB)	UG Semester – 1V
Synthesis and spectroscopic characterizations of Potassium trisoxalatoferrate(III)	C - VIII (LAB)	UG Semester – 1V
Synthesis and spectroscopic characterizations of Tris(ethylenediamine) nickel(II) chloride	C - VIII (LAB)	UG Semester – 1V
Synthesis and spectroscopic characterizations of $[Mn(acac)_3]$ and $Fe(acac)_3$ (acac = acetylacetonate)	C - VIII (LAB)	UG Semester – 1V
Extraction of caffeine from tea leaves	C – XII (LAB)	UG Semester - 5
Preparation of Methyl Orange	C – XII (LAB)	UG Semester - 5

New Practicals

Name of the Experiment	Paper	Semester
Synthesis of ZnO (an inorganic pigment)	DSE-4 (LAB)	UG Semester - 6
Determination of free acidity in ammonium sulphate fertilizer.	DSE-4 (LAB)	UG Semester - 6
Estimation of Calcium in Calcium ammonium nitrate fertilizer.	DSE-4 (LAB)	UG Semester - 6
Estimation of phosphoric acid in superphosphate fertilizer.	DSE-4 (LAB)	UG Semester - 6
Analysis of Cement.	DSE-4 (LAB)	UG Semester - 6
Synthesis and spectroscopy of Gold and Silver Nanoparticles using Turkevich Method	DSE-4 (LAB)	UG Semester - 6
Preparation and characterization of nanoparticles of gold using tea leaves	DSE-3 (LAB)	UG Semester - 6
Use of enzymes as catalysts : Benzoin condensation using Thiamine Hydrochloride as a catalyst instead of cyanide.	DSE-3 (LAB)	UG Semester - 6

New Practicals

Name of the Experiment	Paper	Semester
Alternative Green solvents: Extraction of D-limonene from orange peel using liquid CO ₂ prepared from dry ice.	DSE-3 (LAB)	UG Semester - 6
Solvent free, microwave assisted one pot synthesis of phthalocyanine complex of copper (II).	DSE-3 (LAB)	UG Semester - 6
Photoreduction of benzophenone to benzopinacol in the presence of sunlight.	DSE-3 (LAB)	UG Semester - 6
Determination of dissolved oxygen in water.	DSE-5 (LAB)	UG Semester - 6
Determination of Chemical Oxygen Demand (COD)	DSE-5 (LAB)	UG Semester - 6
Determination of Biological Oxygen Demand (BOD)	DSE-5 (LAB)	UG Semester - 6
Estimation of total alkalinity of water samples (CO ₃ ²⁻ , HCO ₃ ⁻) using double titration method.	DSE-5 (LAB)	UG Semester - 6

Equipment Purchased for the Experiments under DBT Star College Scheme

Name of the Equipment
pH meter
Potentiometer
Colorimeter
Visible Spectrometer
Conductivity meter
Imported Digital Automatic Polarimeter
Micro centrifuge
Digital Precision Balance

Equipment Purchased for the Experiments under DBT Star College Scheme

Name of the Equipment

Hot Air Oven

Variable Volume Micropipette

Magnetic Stirrer

Temperature controlled water bath

DO Meter

BOD Incubator

COD condenser

MW Oven with magnetic stirrer and condenser

Interdisciplinary/Interdepartmental Projects under DBT Star College Scheme



**RAMAKRISHNA MISSION VIVEKANANDA
CENTENARY COLLEGE**

(An Autonomous College)

P.O. RAHARA, KOLKATA-700118

WEST BENGAL, INDIA

Centre with Potential for Excellence (CPE)

Webinar on Interdepartmental Enrichment Program

Under DBT Star College Scheme

On 7th April, 2021 (11am – 4.00pm)

Interdisciplinary/Interdepartmental Projects

Program Schedule:

11am – 11.40 am: Dr. Kalayan Brata Chatterjee, Physics, RKMVCC (Topic :The art of estimation)

11.50am – 12.30 pm : Dr. Anirban Kundu, Botany, RKMVCC (Topic: Protein bioinformatics – Structural dynamics and properties)

12.40pm – 1.20 pm: Dr. Sougata Sarkar, Chemistry, RKMVCC (Topic: Chemistry of Buffer Solution)

1.30 pm - 2.30 pm : LUNCH

2.30 pm – 3.10 pm: Dr. Subham Mookherjee, Zoology, RKMVCC (Topic: Environmental water sources and diarrhea)

3.20 pm – 4.00 pm: Dr. Phonindra Nath Das, Mathematics (Topic: LaTeX for scientific documentation)

CHEMISTRY OF BUFFER SOLUTION

**Sougata Sarkar
Department of Chemistry
RKMVC College**

**Presentation on
Interdepartmental Enrichment Programme
Under
DBT Star College Scheme**

Workshops & Seminars under DBT Star College Scheme

Title	Speaker	Date
Webinar on “Molecular Detection of Diabetes Mellitus from Exhaled Breath Analysis”	Dr. Chiranjit Ghosh, Post-doctorate Research Fellow, Division of Infectious Disease, Harvard Medical School/BWH, Harvard University	3rd July, 2020
Webinar on “Biophysics of protein folding aggregation in Neurodegenerative diseases”	Dr. Sumanta Ghosh, Postdoctoral Research Fellow, University of Texas, USA	3rd July, 2020
Induction Programme “For the Newly admitted students of Chemistry of the college”	Dr. Ashok Kumar Mishra, Professor and Dean Academic Research, Department Of Chemistry, IIT Madras.	28th September, 2020
Motivation Programme “For the Newly admitted B.Sc. 1st yr. students of the college 2020 for JBNSTS entrance Test”	Dr. Paromita Roy, Deputy Director, JBNSTS , Dr. Smarajit Manna, Student Advisor, JBNSTS	8th November, 2020

Workshops & Seminars

Title	Speaker	Date
Webinar on “Protein folding and interactions”	Prof. Pinakpani Chakrabarti, Senior Prof and J.C. Bose Fellow, Department of Biochemistry, Bose Institute	8 th January, 2021
Webinar on “Tackling the Flu: From H1N1 to Sars-CoV-2”	Dr Arindam Mondal IIT Kharagpur	31 st March, 2021

Visits to Industry & Important Labs of National Eminence

Lab	Collaborator	Field
West Bengal University of Animal & Fishery Sciences (WBUAFS)	Dr Paresh Nath Chatterjee Associate Professor	Application of Nanoparticles in Animal Nutrition

Other Labs
TCG Lifesciences Private Limited Chembiotek
IISER Kolkata (Chemical Science)
Jadavpur University (Research Laboratories)
Indian Association for the Cultivation of Science
Geological Survey of India (Salt Lake Campus)

Lectures Delivered by Speakers in Topical Areas

Title	Speaker	Date
Webinar on “ Molecular Detection of Diabetes Mellitus from Exhaled Breath Analysis ”	Dr. Chiranjit Ghosh, Post-doctorate Research Fellow, Division of Infectious Disease, Harvard Medical School/BWH, Harvard University	3rd July, 2020
Webinar on “ Biophysics of protein folding aggregation in Neurodegenerative diseases ”	Dr. Sumanta Ghosh, Postdoctoral Research Fellow, University of Texas, USA	3rd July, 2020
Webinar on “ Protein folding and interactions ”	Prof. Pinakpani Chakrabarti, Senior Prof and J.C. Bose Fellow, Department of Biochemistry, Bose Institute	8 th January, 2021
Webinar on “ Tackling the Flu: From H1N1 to Sars-CoV-2 ”	Dr Arindam Mondal IIT Kharagpur	31 st March, 2021

Outreach Activities

One-Day Science Outreach Programme

Organized By

Ramakrishna Mission Vivekananda Centenary College



Under

DBT-STAR College Scheme

In-association with

Govt Sponsored Multipurpose School for Boys'

Taki House



Programme Schedule

Date: 9th April 2021 (Friday)

Platform: Google Meet

Joining at the Meet: 10:40-10:50 AM

Inaugural Address	Principal, RKMVC College & Head Mistress, GSMS for Boys', Taki House	10:50 – 11:00 AM
Lecture 1 Subject: Zoology Title: <i>Why We Need To Know Ecology</i>	Dr Arunava Mukherjee	Talk: 11:00-11:30 AM Students' interaction: 11:30-11:35 AM
Lecture 2 Subject: Chemistry Title: <i>History of Coordination Chemistry</i>	Dr Sougata Sarkar	Talk: 11:40-12:10 PM Students' interaction: 12:10-12:15 PM
Lecture 3 Subject: Physics Title: <i>Origami and Modern Science</i>	Dr Kalyan Brata Chatterjee	Talk: 12:20-12:50 PM Students' interaction: 12:50-12:55 PM
Lecture 4 Subject: Botany Title: <i>Light and Life: The Indispensable Process of Photosynthesis</i>	Dr Avik Kumar Choudhury	Talk: 1:00-1:30 PM Students' interaction: 1:30-1:35 PM
Concluding Remarks		

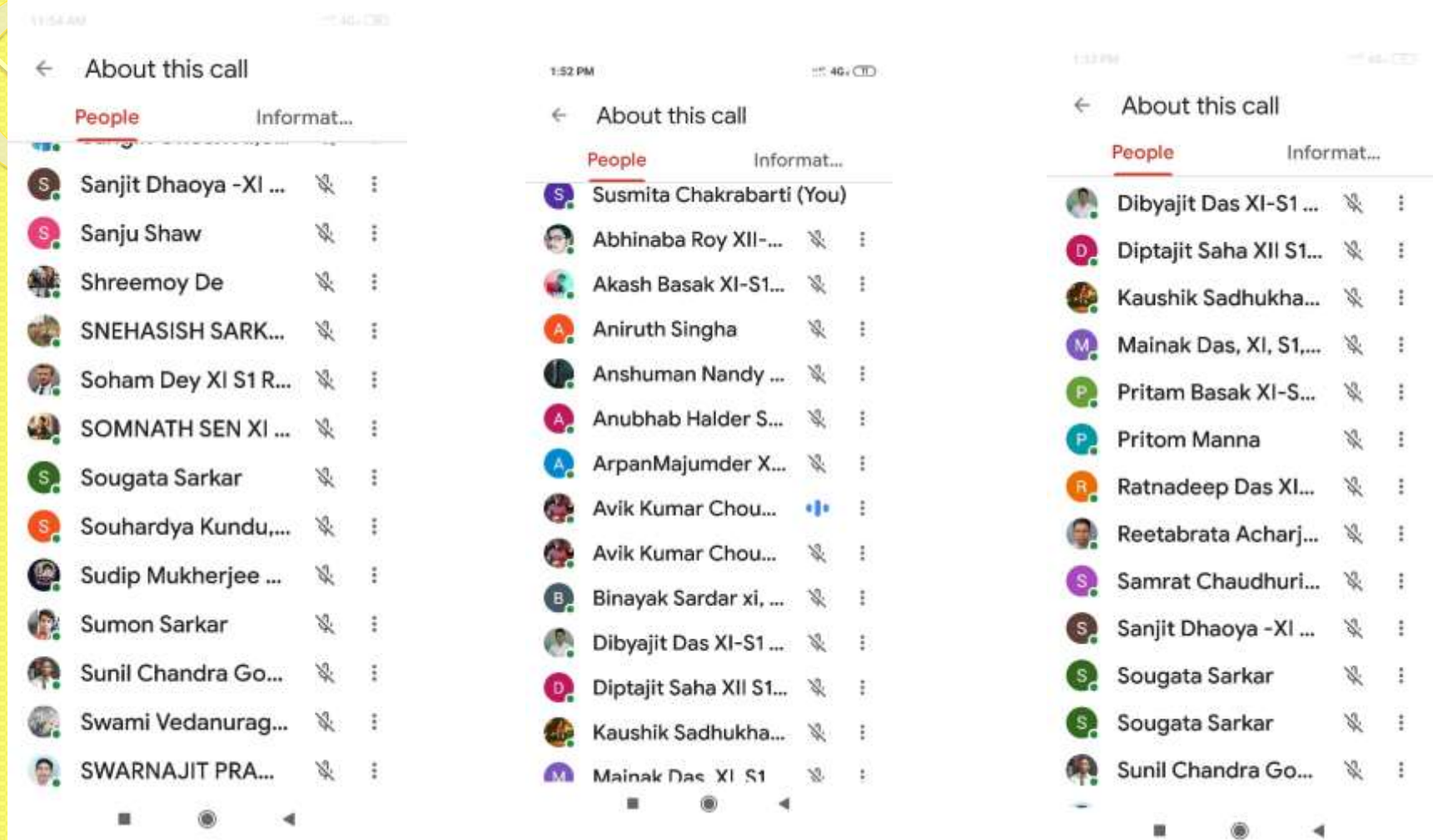
History of Coordination Chemistry

**Sougata Sarkar
Department of Chemistry
RKMVC College**

**Presentation on
Outreach Programme
Under
DBT Star College Scheme**

Outreach Activities

Teacher-Students Interaction



Total no. of students and teachers: 45

Training of Lab Manpower



Impact of the Star College Scheme

No. of Students Qualifying Chem(Hons) in UG level	Admission of Students in MSc/Integrated MSc degree in various academic institutions
100%	TIFR – 01 (IIT Hyderabad, JNCASR, TIFR-Hyderabad, IISER Pune, IISER Kolkata)
	IISc Bangalore - 01
	IIT Kanpur - 02
	IIT Bombay - 02
	IIT Kharagpur - 05
	IIT Dhanbad - 02
	IIT Hyderabad - 01
	IIT Guwahati - 01
	IIT Tirupati - 01
	IISER Thiruvananthapuram - 01

Budget Expenditure

Non-Recurring

Item	Rs
Equipment	899693.00
Laptops (02)	78120.00
Load Balancing Router and POE	24570.00
Total	1002383.00

Recurring

Item	Rs
Chemicals and Reagents	300004.00

Budget Expenditure



Ph: 033-2568-2049
Email: rkmvccollege@rkmvccrahara.org
Website: rkmvccrahara.org

RAMAKRISHNA MISSION VIVEKANANDA CENTENARY COLLEGE

(A Unit of R.K.M. Boys' Home, Rahara)
(An Autonomous College)

P.O. RAHARA, KOLKATA-700118
WEST BENGAL, INDIA

Accredited by NAAC with Grade A
College with Potential for Excellence(CPE)

Swami Vivekananda Centre for Multidisciplinary
Research in Basic Science and Social Science

Ref No.: RKMVCC/DBT/CHEM/EQUIP-2

Date: 22-12-2020

CENTRAL TAX (RATE) /INTEGRATED TAX (RATE) EXEMPTION CERTIFICATE FORRESEARCHORGANISATIONS

Central Tax (rate) /Integrated Tax(Rate) Exemption Certificate in terms of notification No. 45/2017-Central Tax (Rate) and No. 47/2017 - Integrated Tax (Rate) dated 14.11.2017 issued by Ministry of Finance, Department of revenue of Government of India.

Sl. No.	Name and Address of the Institute	Details
1.	Name and address of the Institute	RAMAKRISHNA MISSION VIVEKANANDA CENTENARY COLLEGE, P.O. RAHARA, KOLKATA-700118
2.	Scientific Research	Basic Science and Social Science
3.	GST Registration No.	19AAAR1077P8ZT
4.	PAN No.	AAAR1077P
5.	Brief description of the item	As per Annexure-1
6.	Name and address of the supplier	BIKASH SCIENTIFIC INSTUMENTS PVT. LTD. "Sushamalaya", 413/190, Chhatinakandi KANDI Dist.: Murshidabad PIN-742137 West Bengal, India
7.	Purchase Invoice No./ Indent No.	BSI/QUOT/1549F/20-21 dt. 07/12/2020
8.	Cost of the material as per quotation	Rs. 6,12,990.00 (including 5% GST)
9.	Purpose of which the item is purchase	Research & Development purpose only

Certified that the goods in respect of which exemption from Central Tax (Rate) / Integrated Tax (Rate) is claimed under the Notification is required for research purpose only.

Regards,

Yours sincerely

Sw. Kamalasthananda

(Swami Kamalasthananda)

Principal
Ramakrishna Mission
Vivekananda Centenary College
P.O. Rahara, Kolkata-700118

Annexure-1

Sl. No.	Instrument Name	Brand/Model	Quantity	Price/Unit (Rs)	Total Price (Rs)
1	PH-meter	Systronics 335	4	12390.00	49560.00
2	Potentiometer	Systronics 318	4	12495.00	49980.00
3	Colorimeter	Systronics 112	2	12390.00	24780.00
4	Visible spectrometer	Systronics 105	4	42420.00	169680.00
5	Conductivity meter	Systronics 304	3	13230.00	39690.00
6	Digital thermometer	Hanna Italy	2	2625.00	5250.00
7	Imported Digital Automatic Polarimeter	BSILab P-701	1	136500.00	136500.00
8	Microprocessor Controlled Hot Air Oven LCD display Temp: 50-250°C Size: 18X18X24 inch	BSILab HAO-181824	1	31500.00	31500.00
9	Magnetic stirrer Capacity :1Ltr	Remi 1ML	3	5250.00	15750.00
10	Micropipette (variable volume pipette)	Tarson T-200 (20-200 microlit)	1	6300.00	6300.00
		Tarson T-1000 (200-1000 microlit)	2	6300.00	12600.00
11	Digital precision balance 200 gm-1.0 mg	Wenser PGB-220	3	10500.00	31500.00
12	Micro centrifuge	BSILab MC-T1	1	18900.00	18900.00
13	Water bath high temp ambient to 90 °C Accuracy: +1 °C. Size: 13X12X7 inch	BSILab WB-131207	1	21000.00	21000.00
Total Price					612990.00

Budget Expenditure



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Research in Basic Science and Social Science

Ph: 033-2568-2343

Email: ramcvt@ramcvt.org

Website: ramcvt.org

Ref No.: RKMVCC/DBT/CHEM/EQUIP-1

Date: 24-12-2020

CENTRAL TAX (RATE) / INTEGRATED TAX (RATE) EXEMPTION CERTIFICATE FOR RESEARCH ORGANISATIONS

Central Tax (rate) / Integrated Tax (Rate) Exemption Certificate in terms of notification No. 45/2017-Central Tax (Rate) and No. 47/2017 - Integrated Tax (Rate) dated 14.11.2017 issued by Ministry of Finance, Department of revenue of Government of India.

Sl. No.	Name and Address of the Institute	Details
1.	Name and address of the Institute	RAMAKRISHNA MISSION VIVEKANANDA CENTENARY COLLEGE, P.O. RAHARA, KOLKATA-700118
2.	Scientific Research	Basic Science and Social Science
3.	GST Registration No.	19AAAAAR1077P8ZT
4.	PAN No.	AAAAAR1077P
5.	Brief description of the item	As per Annexure-1
6.	Name and address of the supplier	Indian Instruments Manufacturing Company 208, Bipin Behari Ganguly Street (Bowbazar St.) Kolkata - 700012 West Bengal, India
7.	Purchase Invoice No./ Indent No.	IIMC/QTN/INST./2019-2020 dt. 23/12/2020
8.	Cost of the material as per quotation	Rs. 2,86,703/- (Including 5% GST)
9.	Purpose of which the item is purchase	Research & Development purpose only

Certified that the goods in respect of which exemption from Central Tax (Rate) / Integrated Tax (Rate) is claimed under the Notification is required for research purpose only.

Regards,

Yours sincerely

Sd. Kamalasthananda

(Swami Kamalasthananda)

Principal
Ramakrishna Mission
Vivekananda Centenary College
P.O. Rahara, Kolkata-700118

Annexure-1

Sl. No.	Instrument Name	Brand/Model	Quantity	Price/Unit (Rs)	Total Price (Rs)
1	DO Meter	EUTECH/ECDO70042S	1	57750.00	57,750.00
2	BOD Incubator	YOMA/CIS 6D, 6 cft.	1	60900.00	60,900.00
3	COD Condenser	Indigenous make	1	1050.00	1,050.00
4	Thermo Reactor	WTW/CR2200	1	84998.00	84,998.00
5	High Volume Air Sampler	ENVIROTECH/APM433	1	68250.00	68,250.00
6	Microwave Oven with Magnetic Stirrer and Reflux Condenser set up.	The system consisting of: (i) Microwave Oven (Branded)	1	7875.00	13,755.00
		(ii) Magnetic Stirrer Brand: ELTEK Model: M2D, 2 Ltrs.	1	5250.00	
		(iii) Reflux Condenser (Branded)	1	630.00	
				Total	2,86,703.00

Budget Expenditure

Annexure - I



VIVEKANANDA CENTENARY COLLEGE

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Research in Basic Science and Social Science

Ph: 033-2568-2049

Email: rimvcccollege@rimvccrahara.org

Website: rimvccrahara.org

Ref No.: RKMVCC/DBT/CHEM/Chemicals-1

Date: 06-01-2021

CENTRAL TAX (RATE) /INTEGRATED TAX (RATE) EXEMPTION CERTIFICATE FORRESEARCHORGANISATIONS

Central Tax (rate) /Integrated Tax(Rate) Exemption Certificate in terms of notification No. 45/2017-Central Tax (Rate) and No. 47/2017 - Integrated Tax (Rate) dated 14.11.2017 issued by Ministry of Finance, Department of revenue of Government of India.

Sl. No.	Name and Address of the Institute	Details
1.	Name and address of the Institute	RAMAKRISHNA MISSION VIVEKANANDA CENTENARY COLLEGE, P.O. RAHARA, KOLKATA-700118
2.	Scientific Research	Basic Science and Social Science
3.	GST Registration No.	19AAAAAR1077P8ZT
4.	PAN No.	AAAAAR1077P
5.	Brief description of the item	As per Annexure-1
6.	Name and address of the supplier	Oriental Stores Supplying Co. 87 A, Chittaranjan Avenue, Kolkata - 700073
7.	Purchase Invoice No./ Indent No.	C/170/2020-21 Dated 22.12.2020
8.	Cost of the material as per quotation	Rs. 3,00,003.90 (including 5% GST)
9.	Purpose of which the item is purchase	Research & Development purpose only

Certified that the goods in respect of which exemption from Central Tax (Rate) / Integrated Tax (Rate) is claimed under the Notification is required for research purpose only.

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Yours sincerely

Sw. Kamalasthananda

(Swami Kamalasthananda)

Principal

Ramakrishna Mission

Vivekananda Centenary College

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Sl. No.	Name of Reagents	Unit weight	Unit Price (Rs)	No. of Unit	Total Price (Rs)
1	Ammonium meta vanadate	100 g	957.60	10	9576.00
2	Sodium tungstate	250 g	1680.00	06	10080.00
3	Ammonium heptamolybdate	250 g	2290.05	03	6870.15
4	Sodium molybdate	250 g	1790.25	06	10741.50
5	Tungstic acid	100 g	882.00	04	3528.00
6	Molybdic acid	100 g	1199.10	05	5995.50
7	Cerric ammonium sulfate	100 g	1729.35	10	17293.50
8	Chromium(III) sulfate	500 g	294.00	06	1764.00
9	Zirconium nitrate	100 g	1544.55	08	12356.40
10	Silver nitrate	25 g	3089.10	10	30891.00
11	Potassium iodide	250 g	2606.10	15	39091.50
12	Potassium bromide	500 g	590.10	04	2360.40
13	Potassium iodate	100 g	931.35	05	4656.75
14	Potassium bromate	500 g	609.00	04	2436.00
15	Bismuth oxide	100 g	751.80	05	3759.00
16	Antimony oxide	500 g	1296.75	03	3890.25
17	Antimony sulphide	250 g	689.85	08	5518.80
18	Stannic oxide	500 g	5355.00	02	10710.00
19	Cadmium iodide	100 g	1896.30	06	11377.80
20	Cadmium bromide	100 g	400.05	03	1200.15
21	Mercurous nitrate	100 g	3543.75	02	7087.50
22	Aluminium sulfate	500 g	176.40	05	882.00
23	Cobalt sulfate	500 g	3945.9	02	7891.80
24	Cobalt oxide	50 g	802.20	10	8022.00
25	Nickel phosphate	250 g	898.80	05	4494.00
26	Strontium chloride	500 g	266.70	04	1066.80
27	Strontium nitrate	500 g	365.40	05	1827.00
28	Anthracene	100 g	573.30	05	2866.50
29	Benzil	250 g	420.00	05	2100.00
30	Benzoin	100 g	370.65	05	1853.25
31	p-Nitrophenol	500 g	558.60	04	2234.40
32	p-Aminobenzoic acid	100 g	297.15	05	1485.75

Budget Expenditure

33	Diethyl ether	2.5 ltr	1202.25	08	9618.00
34	Acetone	2.5 ltr	919.80	08	7358.40
35	o-Nitoraniline	250 g	577.50	05	2887.50
36	m-nitroaniline	250 g	567.00	05	2835.00
37	p-nitroaniline	100 g	187.95	05	939.75
38	Phthalic anhydride	500 g	346.50	04	1386.00
39	Vanadyl sulphate pentahydrate	100 g	1968.75	04	7875.00
40	Salicyl aldehyde	100 ml	945.00	04	3780.00
41	Ethylenediamine	500 ml	480.90	04	1923.60
42	Sodium dihydrogen phosphate	500 g	340.20	04	1360.80
43	Disodium hydrogen phosphate	500 g	437.85	04	1751.40
44	Sodium acetate trihydrate	500 g	176.40	03	529.20
45	Nickel chloride	500 g	1753.50	02	3507.00
46	Cobalt(II) chloride	500 g	3514.35	03	10543.05
47	L(-) alanine	25 g	476.70	02	953.40
48	Glycine	500 g	718.20	02	1436.40
49	2,2'-bipyridine	5 gm	472.50	05	2362.50
50	8-hydroxyquinoline	100 g	676.20	03	2028.60
51	Chromium nitrate	250 g	340.20	03	1020.60
Total Price					3,00,003.90

Future Activities under DBT STAR College Scheme

- ❖ Minor Projects (Theoretical/Experimental) for Undergraduate Student - 02**
- ❖ Preparation of operating manual for new equipment**
- ❖ Incorporation of new and advance experiments - 03**
- ❖ Academic visit of students to reputed research laboratories and industries - 02**
- ❖ Hands on training of laboratory/staff members and make them more accustomed with the new experimental tools - 02**
- ❖ Interdisciplinary and interdepartmental projects – 02**
- ❖ Out reach programme with school students (Seminar/Practical Demonstration) – 02**



सत्यमेव जयते

**Department of
BioTechnology,
Government
of India**

DBT STAR College Scheme

