Sonopant Dandekar Shikshan Mandali's

SONOPANT DANDEKAR ARTS, V.S. APTE COMMERCE AND M.H. MEHTA SCIENCE COLLEGE, PALGHAR

PRADHAN MANTRI UCHCHATAR SHIKSHA ABHIYAN (PM-USHA)

PM-USHA

PRADHAN MANTRI UCHCHATAR SHIKSHA ABHIYAN

Template for Proposal for

GRANTS TO STRENGTHEN COLLEGES

Submitted by

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Principal

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PREFACE

In an endeavour to bridge the educational divide and empower marginalized communities, we proudly present a comprehensive array of higher education courses, encompassing over 30 diverse disciplines, affiliated with the esteemed University of Mumbai. Situated within the heart of the rural expanse of Palghar District, our institution stands as a beacon of accessible education, tailored to meet the needs of the Adivasi population and women, while maintaining affordability as a cornerstone of our mission. We firmly believe that education is the cornerstone of progress, and every individual deserves the opportunity to harness their potential and shape a brighter future.

As a testament to our dedication and relentless pursuit of excellence, we are proud to have been recognized as the best college in the region by University of Mumbai and also holds significant ranking in providing quality education at low cost fees by India Today for three consecutive years. This accolade stands as a reflection of our unwavering commitment to nurturing talent, fostering innovation, and creating a conducive environment for holistic growth. Our tireless efforts to provide a nurturing and enriching educational experience are guided by the belief that education is a transformative force capable of transcending barriers and reshaping destinies.

The journey towards education equity and inclusivity has been a path illuminated by the aspirations of those often left on the peripheries of opportunity. Our commitment to fostering an environment where diversity thrives is evident in our extensive course offerings, which span fields ranging from humanities and sciences to technology and vocational studies. This holistic approach ensures that students are equipped not only with knowledge but with the skills needed to excel in an ever-evolving world.

Our faculty members are not just educators; they are mentors, guides, and facilitators of transformative learning experiences. With a blend of academic expertise and real-world insights, our faculty members are committed to nurturing inquisitive minds and fostering a passion for lifelong learning.

Central to our mission is the provision of education that doesn't burden families financially. We understand that access to quality education should not be determined by economic constraints. Therefore, we have diligently structured our programs to be

affordable, enabling those with a thirst for knowledge to quench it without financial hardship.

While we celebrate our accomplishments, we remain steadfast in our commitment to driving change and expanding horizons. By fostering a learning environment that is both culturally sensitive and globally aware, we empower our students to contribute meaningfully to society. The Adivasi community and women who walk through our doors are not just students; they are agents of progress, catalysts of transformation, and the embodiment of our institution's ideals.

As we move forward on this educational journey, we are fueled by a collective vision of a community that thrives on knowledge, empowerment, and progress. We extend our warm welcome to all aspiring learners, regardless of their background, to join us in shaping a future that is enriched by education, driven by purpose, and illuminated by success. Together, we strive to not only provide education but also to ignite the flames of curiosity, open doors of opportunity, and build a legacy of excellence and request you to help us contribute towards our vision PM- USHA.

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TEMPLATE FOR PROPOSAL FOR

GRANTS TO STRENGTHEN COLLEGES

SECTION 1: PREAMBLE

A. Name of the College : **Sonopant Dandekar Shikshan Mandali's Sonopant Dandekar Arts, V.S. Apte Commerce and M.H. Mehta Science College, Palghar**

B. Address of the college : **Kharekuran Road, Palghar (W), Tal. & Dist. Palghar, Maharashtra – 401 404**

C. AISHE Code : **C-34065**

D. Name of the District : **Palghar**

E. Whether State Government aided or State Government College : **State Government Aided**

F. Whether Constituent college or affiliated college of a University: **Affiliated**

G. Name of University : **University of Mumbai**

H. Year of opening : **1970**

I. Is the college running from a permanent campus or temporary campus: **Permanent campus**

J. Accreditation status as on date of application: Accredited/Not accredited : **Accredited**

K. If Not Accredited, then whether it has submitted the IIQA and has started the process of getting Accreditation: **Yes** (**Six AQAR Report submitted by the College and the process of filling IIQA for Third cycle started.)**

L. If accredited then Accreditation score and Grade:

Score	Grade
2.74	**B**

M. Date of validity of accreditation: **28th March 2021** (**Six AQAR Report submitted by the College and the process of filling IIQA for Third cycle started.)**

N. Is the district of the college location a focus district : **Yes (Dist. - Palghar)**
O. Has the institution been earlier approved under RUSA: **No**
P. Details of earlier consolidated approvals to the institution under RUSA (as on date of application:

S. No.	Name of the Component	Central Share Approved (Rs. Crore)	Central Share Released (Rs. Crore)	Central Share Utilised	State Share Approved	State Share Released	State Share Utilised	Total Amount Approved (Rs. Crore)	Total Amount Released (Rs. Crore)	Total Amount Utilised (Rs. Crore)	Whether project completed (including all hard and soft items of expenditure)	If yes, enclose completion certificate	If not completed, then what is the percentage of completion of the overall project
N.A.													
	Total												

SECTION 2: DETAILS ABOUT THE COLLEGE:

A. Vision Mission of the College:

Provide higher education to all, especially to the tribal and Women folks.

B. Broad objectives of the College:

1) Deliberate efforts to admit every eligible student and no student should be deprived of higher education.
2) Emphasis on the development of integrated personality of the students to fit them in a competitive world.
3) To work for integrated rural development through students.
4) To develop the concept of “TOMORROW” among the tribal folk through adult and non-formal education.
5) And to encourage teaching and non-teaching staff to pursue higher education.
6) The Institute strives to attain these objectives constantly through its various academic, curricular and extracurricular activities.

7) Organizational Structure for Operation and Management

Sr. No.		Designation
1.	CA Shri. Sachin Kore	President
2.	Shri. Dhanesh Vartak	Vice President

3.	**Shri. Pratap Varayya**	**Vice President**
4.	**Shri. Mangesh Pandit**	**Treasurer**
5.	**Shri. Sudhir Kulkarni**	**Secretary**
6.	**Shri. Anil Patil**	**Secretary**
7.	**Dr. Kiran Save**	**Principal**

8) Role and Responsibilities of Key Positions/ bodies:

Following are some of the roles and responsibilities associated with the various position of Governing Council:

1. Strategic Leadership: The College Development Committee is in charge of the institution's strategic direction and leadership. Setting long-term objectives, creating a future vision for the organisation, and ensuring that all operations are in line with its mission and core values are all part of this process.

2. Management: The Governing Body iis in charge of the institution's general management. Ensuring the institution operates effectively includes managing budgets, financial planning, resource allocation, and organisational structures.

3. Academic Leadership: The Principal along with Academic Heads are essential to preserving and improving the institution's academic standing. Developing and implementing academic programmes, policies, and initiatives that support excellence in teaching, research, and scholarship requires working with academic deans and faculty.

4. External Relations: The Principal interacts with external stakeholders, including as local authorities, funders, alumni, business partners, and government officials as the institution's public face. It's crucial to establish and maintain good relationships with these parties in order to raise money, engage in advocacy, and encourage community support.

5. Fundraising and Development: The CDC frequently play a big part in the institution's fundraising initiatives. To support the institution's ideas and programmes, they try to assemble money from a variety of sources, such as government grants, individual donations, business alliances, and charitable organisations.

6. Management of Enrolment: The Principal and Academic Heads are responsible in developing enrolment objectives and plans to draw in and keep students. To create

successful recruitment and retention strategies, this may entail working with the admissions and marketing staff.

7. Institutional Advancement: The IQAC improves the institution's stature and reputation. This includes highlighting the accomplishments and successes of the faculty, staff, and students as well as resolving any problems or difficulties that may occur.

8. Governance: Working with the institution's governing board, the IQAC aids in formulating policies, making tactical choices, and ensuring adherence to pertinent rules and laws.

9. Crisis Management: The Principal and IQAC co-ordinator assumes a leadership position in handling the situation, effectively engaging stakeholders, and putting the required solutions in place to address the problems.

10. Long-Term Planning: The IQAC and CDC are involved in institutional long-term planning, which may include growth, infrastructure improvement, curriculum revisions, and adjusting to shifts in the educational environment.

11. Advocacy and Public Relations: The CDC participates in public policy debates and media appearances to promote the institution's interests and the value of education.

12. Fostering Diversity and Inclusion: The IQAC and CDC works to promote equity and fairness in all facets of the institution's activities.

Therefore the co-ordinated efforts from the team, help institute raise the benchmark.

9) Board of Governance

OFFICE BEARER		
1.	**CA Shri. Sachin Kore**	**President**
2.	**Shri. Dhanesh Vartak**	**Vice President**
3.	**Shri. Pratap Varayya**	**Vice President**
4.	**Shri. Mangesh Pandit**	**Treasurer**
5.	**Shri. Sudhir Kulkarni**	**Secretary**
6.	**Shri. Anil Patil**	**Secretary**
7.	**Dr. Kiran Save**	**Principal**

BOARD OF MANAGEMENT			
1	Hon. Shri. Chandrakant N. Dandekar, Member	21	Hon. Shri. Sachin S. Bhanushali, Member
2	Hon. Shri. Suresh M. Joshi, Member	22	Hon. Shri. Pratap K. Varayya, Member
3	Hon. Shri. Sudhir Vasant Kulkarni, Member	23	Hon. Shri. Shailesh S. Shah, Member
4	Hon. Shri. Prakash S. Sankhe, Member	24	Hon.Shri. Sachin G. Kore, Member
5	Hon. Shri. Bhogilal D. Veera, Member	25	Hon. Shri. Sachin S. Chitre, Member
6	Hon. Shri. Sohanlal Bafna, Member	26	Hon. Shri. Mangesh Natavarlal Doshi, Member
7	Hon. Shri. Vijaybhansingh Thakur, Member	27	Hon. Shri. Kiran N. Shah, Member
8	Hon. Smt. Sunita Suresh Joshi, Member	28	Hon. Smt. Amita J. Raut, Member
9	Hon. Smt. Jyoti Rajesh Meher, Member	29	Hon. Shri. Narendra T. Popat, Member
10	Hon. Shri. Karim A. Amlani, Member	30	Hon. Shri. Suresh N. Bhat, Member
11	Hon. Shri. Anil P. Patil, Member	31	Hon. Shri. Adv. Hemprakash V. Tarade, Member
12	Hon. Shri. Jagannath Pilaji Raut, Member	32	Hon. Shri. Dinesh S. Dubey, Member
13	Hon. Shri. Chandrakant S. Tiwari, Member	33	Hon. Shri. Bharat P. Raut, Member
14	Hon. Shri. Bharat V. Bhanushali, Member	34	Hon. Shri. Mangesh M. Pandit, Member
15	Hon. Shri. Dhandesh Vartak	35	Hon. Shri. Jaywant H. Save, Member
16	Prof. Ashok Thakur, Member	36	Hon. Shri. Pandhari B. Meher, Member
17	Hon. Smt. Sandhya Subhash Shrungarpure, Member	37	Hon. Smt. Shaila Sudhir Kulkarni, Member
18	Hon. Shri. Narendra Baburao Patil, Member	38	Hon. Shri. Dinesh Chintaman Patil, Member
19	Hon. Shri. Hitendra Shah, Member	39	Hon. Shri. Atul Dandekar, Member
20	Hon. Shri. Bhupendra Harishchandra Save, Member	40	Hon. Shri. Jayant Vishnu Dandekar, Member

COLLEGE DEVELOPMENT COMMITTEE	
Hon. CA. Sachin G. Kore	President
Hon. Shri. Sudhir Kulkarni	Secretary
Hon. Dr. Kiran J. Save	Principal
Hon. Shri. B. K. Sakhare	Physics(HOD)
Hon. Shri. Dr. Tanaji Pol	Vice Principal/ Teacher Representative
Hon. Prof. Asmita Raut	Teacher Representative
Hon. Shri. Mangesh Pandit	Treasurer
Hon. Shri. Bhupesh Gharat	Member, Invited
Hon. Shri. Ajit Rane	Member, Invited

Hon. Ramesh Shetty	Member, Invited
Hon. Prof. Mahesh Deshmukh	IQAC Member
Hon. Dhanesh D. Vartak	Vice President, Invited Member
Hon. Shri. Anil Patil	Secretary, Invited Member

10) Project Monitoring Unit (PMU) details:

1)	**Adv. G. D. Tiwari**	President
2)	**Dr. Kiran J. Save**	Principal
3)	**Prof. Mahesh Deshmukh**	IQAC Convener & Vice Principal
4)	**Prof. (Dr.) Tanaji Pol**	Vice Principal
5)	**Dr. Manish Deshmukh**	HOD, Department of Commerce
6)	**Dr. Shreya Mishra**	Assistant Professor (Accountancy)
7)	**Dr. Suhas Janwadkar**	HOD, Department of Chemistry
8)	**Dr. Harshad Vanmali**	HOD, Department of Zoology
9)	**Major B. K. Sakhare**	HOD, Department of Physics
10)	**Prof. Maqsood Memon**	HOD, Management Studies

11)Total enrolment in the college: **5077**

12)Details of the Departments and Courses offered in the college:

Sl. No.	Departments	Course Offered		Duration (years)	Total enrolment	Sanctioned posts of Regular Faculty	Posts filled in Reglu ar mode	Percentage of Posts filled	Student Teacher Ratio
1	**ARTS** 1) English 2) Marathi 3) Hindi 4) History 5) Economics 6) Political Science 7) Philosophy 8) Geography 9) Psychology 10) Rural Development	UG	**10**	**3**	484 424 143 224 258 211 193 209 117 169	**2** **2** **1** **1** **2** **1** **3** **1** **0** **1**	**2** **2** **1** **1** **1** **1** **3** **1** **0** **0**	**85.71 %**	**1:60**
	1) Marathi 2) History 3) Economics 4) Political Science 5) Geography 6) Psychology	PG	**6**	**2**	43 63 42 33 14 7	**--**	**6**		**1:29**
		PG+	**--**	**--**	PG+				
2	**Science** 1) Chemistry 2) Physics 3) Botany 4) Zoology 5) Mathematics	UG	**5**	**3**	681 173 353 335 139	**10** **4** **5** **7** **2**	**4** **3** **3** **1** **0**	**39.28 %**	**1:34**
	6) Biotechnology 7) Computer Science 8) Information Technology	UG	**3**	**3**	140 187 313	**--**	**17**		**1:46**
	1) Chemistry 2) Physics 3) Botany 4) Zoology 5) Mathematics 6) Biotechnology 7) Information Technology	PG	**7**	**2**	86 22 34 30 38 38 10	**--**	**7**		**1:50**
	Chemistry Physics Botany Zoology Biotechnology	PG+	**5**	**--**		**--**	**--**		--
3	**Commerce (Aided)** 1) Commerce	UG	**3**	**3**	1104	**2**	**1**	**80.00 %**	**1:90**

	2) Accountancy 3) Business Economics				1104 1104	**2** **1**	**2** **1**		
	Commerce (Unaided) 1) Commerce 2) Accountancy 3) Business Economics	UG	**3**	**3**	1104 1104 1104	**--**	**10**		**1:94**
	4) Accounting & Finance 5) Banking & Insurance 6) Financial Markets 7) Management Studies	UG	**4**	**3**	301 51 34 187	**0** **0** **0** **0**	**10**		**1:80**
	1) Advanced Accountancy 2) Business Management	PG	**2**	**2**	129 41	**--**	**4**	**289**	**1:72**
		PG+				**--**	**--**		
	Principal					**1**	**1**		
	Librarian					**1**	**1**		
	Total					**49**	**29**	**59.18 %**	

13) Details of Non-Teaching Staff:

Department	Sanctioned Posts	Posts yet to be Sanctioned
Administrative	**66**	**0**
Technical	**--**	**--**
Others	**--**	**--**
Total	**66**	**0**

14) Teaching staff: Non-teaching ratio – **1:1.40**

SECTION 3: INFRASTRUCTURE DETAILS DETAILS:

A. Existing Land Availability (in acres): **21 Acres**

B. GPS Coordinates of the college: **Latitude: 19.711462389626842,**
Longitude: 72.75953745104209

SECTION 4: PROPOSAL DETAILS:

(Activities under the component are provided in Chapter VI of the Guidelines)

A. Tentative date of completion of Project : 31st March 2026

B. Details of Infrastructure proposed to be constructed :

Sl. No	Description of Infrastructure	Purpose of Infrastructure	Proposed Area Sq. m	Total Cost per Sq. m	Total cost	Justification
1	NIL					
		Total				

C. Details of Infrastructure proposed to be Renovated/upgradation:

Sl. No.	Description of Infrastructure	Detail of renovation/ upgradation proposed	Proposed Area Sq.m	Total Cost per Sq. m	Total cost	Justification
1.	Renovation and Upgradation of Ladies' Washroom (15 in nos) & Inclusion of Unisex Washroom and Gents Washroom (5 in Nos)	1. Repairs and Maintenance of Washroom 2. Modifying an Existing Washroom to be unisex Repairs and Maintenance of Specially abled washrooms	2550	1050	**26,77,500**	Need to upgrade the washrooms with the inclusion of sanitary pad vending machines. Further, transgender unisex washrooms are to be made. **Exhibit No.1**
2.	Office Renovation	**Office Renovation (Includes Office Renovation, Furniture, Seating Arrangement, Networking etc.**	1800	1,409	**25,36,572**	Providing sanitation remains the priority of the institution and hence partial renovation was carried upon since the gestation period of funds is long, the institute through community conducted partial renovation. Therefore the granted funds are now utilized for office renovation with accessible features to make it inclusive for differently abled population.

		Total			**52,14,072**	

D. Details of Equipment to be procured:

Sl. No.	Name of the Equipment	Quantity	Cost per Unit	Total Cost	Justification
A.	**Upgrading Traditional Classrooms to Smart Classrooms**				Incorporating smart classrooms into rural education aligns with the NEP's vision of creating an inclusive, technologically advanced, and learner-centric education system that empowers students to become well-rounded individuals capable of contributing to society.
1.	Interactive panels Android	12	2,50,000	30,00,000	
2.	Ahuja Small Speaker	20	3,600	72,000	
	Total			**30,72,000**	
	Office Digitalization				NEP 2020, not only strives for quality education for the learners and development of teachers but also emphasizes on the outcome- based education, transparency and accountability. Aligning this goal, the institute envisages to empower its administrative staff with improved infrastructure and complete ERP system with transparency that not accounts for funds but also maintains learners' data for mapping its progress. It further proposes to support data analytics and improve use of ICT tools. Further, this revision is looked upon since the alternate smart classrooms technology have come at lower price due to favourable budget (Financial Budget 2024) for technology education. As a result new companies have diversified into the same arena at lower prices. So the balance funds would now be utilized towards office digitization. **(Exhibit-2)**
1.	Server	2	545000	1090000	
2.	RAM	6	17000	102000	
3.	SSD (1TB)	2	9500	19000	
4.	Win Server 2019 Windows License edition	2	24650	49300	
5.	NAS Box (4 TB)	2	45676	91352	
6.	Online UPS (APC SRV5KRIL-IN 5000 VA Sine Wave UPS)	2	139990	279980	
7.	Personal Computers for Office	30	58990	1769700	
8.	Individual UPS for Personal Computers	30	3000	90000	
9.	Manageable Switch	4	25999	103996	
10.	Firewall FortGate	2	85000	170000	
11.	AC for Server Room (1.5 Ton)	2	42500	85000	
12.	MS-Office 2021 STD License	2	23600	47200	
13.	Networking Rack	2	12500	25000	
14.	CAT-6 Network Cable	4	8000	32000	
15.	NET GEAR WIFI ROUTER	12	7499	89988	
16.	CAL License for Server	30	750	22500	
	Total			**40,67,016**	
				7139016	

B.	**Setting up Nodal Digital Centre for the Development of MOOC and Online programs.**				
	Name of the Equipment	**Quantity**	**Cost per Unit**	**Total Cost**	**Justification**
1.	Interactive panels Samsung WM75A	2	3,01,844	603688	Developing a MOOC (Massive Open Online Course) recording centre in an institute that is located in a rural area has several significant benefits aligning the objectives of National Education Policy 2020. **(Exhibit-3)**
2.	Computers:*(Hardware and Software) Mac PC of high configuration with all latest software's	2	2,35,400	470800	
3.	Mac Laptop of High Configuration with all latest software's	2	2,50,000	5,00,000	
4.	Inverter Back up	1	52196	52196	
5.	Mikes and Speakers	4	20000	80000	
6.	Green Backdrop	1	80000	80000	
7.	Sound Proof Glasses	4	1,00,000	400000	
8.	Air Conditioners	2	80000	160000	
9.	Sound System with mixer	1	1,00,000	100000	
	Total			**24,46,684**	

	Department of Biotechnology				
1.	HPLC	1	1800000	1800000	**(Exhibit-4)**
2.	PCR	1	150000	150000	
3.	FTIR	1	1500000	1500000	
4.	Elisa reader with kit and accessories	1	5,00,000	500000	
5.	GC-MS	1	4500000	4500000	
6.	Flame photometer	1	326600	326600	
7.	Cooling Centrifuges PLUS, Capacity: 1200 Ml, RPM- 20,000	1	400000	400000	
8.	Anaerobic Rotary shaker with temperature control	1	1750000	1750000	
9.	Atomic Absorption spectroscopy	1	1210000	1210000	
10.	Double beam UV spectrophotometer	1	550000	550000	
11.	Vertical Laminar Airflow Unit	1	700000	700000	
12.	Bio Safety Cabinet	1	385000	385000	
			TOTAL	**13771600**	
	Department of Chemistry				**(Exhibit-5)**

1.	**GC** (Gas Chromatography)	1	3540000	3540000	
2.	**Rotavapour**	1	826000	826000	
3.	**FTIR** (FT- Infra Red Spectrophotometer)	1	1500000	1500000	
4.	Nanodrop Spectrophotometer	1	691480	691480	
5.	Fumehood	1	250000	250000	
6.	Oil Free Vaccum Pump	1	250000	250000	
7.	Microwave Distillation Assembly	1	250000	250000	
8.	**LC-MS (Liquid Chromatography- Mass Spectrophotometer)**	1	7345000	7345000	
	Total			**14652480**	
	Department of Zoology				
1.	UV-Vis Spectrometer	1	500000	500000	
2.	Microscope with LCD screen	1	100000	100000	
3.	Gel Doc. System	1	400000	400000	
4.	Horizontal electrophoresis	1	20000	20000	
5.	Vertical electrophoresis	1	15000	15000	**(Exhibit-6)**
6.	Sonicator	1	250000	250000	
7.	PCR Thermal Cycler	1	500000	500000	
8.	Semi-Automatic Microtome	1	300000	300000	
9.	Cooling Centrifuge	1	300000	300000	
	Total			**2385000**	
G	**Department of Physics**				
1.	Tubular Furnace	1	160000	160000	
2.	One channel Potentiostat	1	450000	450000	
3.	Magnetic Stirrer with heating	1	20000	20000	
4.	Centrifuge Machine	1	50000	50000	
5.	Hot air oven(1000°C)	1	40000	40000	
6.	Xenon Lamp(1000W)	1	80000	80000	**(Exhibit-7)**
7.	Solar Simulator	1	300000	300000	
8.	Autoclave supercritical system(1 Litre)	1	340000	340000	
9.	Ultrasonic sonication bath	1	43324	43324	
10	Weighing Scale Machine(0.01mg)	1	70000	70000	
	TOTAL			**1553324**	

H	**Department of Botany**				
1	Microscope with Camera attachment	2	1,50,000	3,00,000	(Exhibit-8)
2	Colorimeter	1	6800	6800	
3	Compound Light Microscope	1	8050	8050	
4	Hot Air Oven	1	16000	16000	
5	pH Meter	1	7500	7500	
6	Turbidity Meter	1	9400	9400	
7	Conductivity meter	1	7750	7750	
8	Weighing Balance	1	53324	53324	
9	Centrifuge Machine	1	9000	9000	
	TOTAL			**4,17,824**	

E. Details of Soft component activities

Sl. No.	Activity	Purpose	Details	Unit (Such as the number of vocational courses, mentorship programmes, etc)	Cost per unit	Total Cost	Target the number of beneficiaries	Expected outcome
1	**Training Sessions on Innovative teaching Pedagogy**	To ensure optimal utilization of Smart Classrooms	**Exhibit no.9**	06	200000	120000	200 (each year)	• Participants will gain a deeper understanding of various innovative teaching methods. • Educators will be equipped to apply these techniques to their own teaching contexts. • Increased engagement and interaction in the classroom, leading to enhanced student learning outcomes.
2	**Training and Curriculum Development for Skill Development Centre**	The establishment of an Agro-Based Skill Development Centre in Palghar District aligns well with the National Education Policy (NEP) of 2020. This center aims to play a pivotal role in addressing	**Exhibit no.10**	12	50,000	600000	1000(each year)	• The skills acquired through the agro-based skill center can serve as a foundation for continuous learning and adaptation to evolving agricultural practices and technologies. • It's important to design the training program in a way that aligns with the needs of the agriculture sector and the local community, ensuring that the outcomes are both

		the needs and aspirations of the local population, particularly in rural areas.						relevant and impactful. Regular assessment and feedback from students and industry stakeholders can help refine the program and maximize its benefits.

3	**International Conference on Theme: "Navigating Innovation and Intellectual Property Rights: A Global Perspective"**	In the rapidly evolving landscape of technology, business, and creativity, Intellectual Property Rights (IPR) play a pivotal role in shaping the way innovations are protected, utilized, and shared. The International Conference on IPR invites scholars, practitioners, policymakers, and industry experts from around the world to engage in insightful discussions and thought-provoking exchanges on the intricate relationship between innovation and intellectual property.	**Exhibit no.11**	2 (Over 2 years)	700000	700000	800-1000 (each year)	• Foster interdisciplinary dialogue among scholars, legal experts, industry leaders, and policymakers to gain comprehensive insights into the evolving IPR landscape. • Facilitate knowledge exchange on best practices, case studies, and innovative approaches in IPR protection, management, and enforcement. • Provide a platform for researchers to showcase their latest findings in the realm of intellectual property and innovation.
4.	**Workshops and Seminars**		**Exhibit no.11**	10 (Over 3 years)	100000	1000000	500-7000 (	Overall, the expected outcomes of these workshops and

	on IPR, Research Methodology and Sustainability						each year)	seminars include an enriched knowledge base, skill development, enhanced professional practices, and a broader perspective on the importance of intellectual property rights, research methodology, and sustainability in various sectors. Participants will be better equipped to contribute meaningfully to their fields and to society at large.
	Total					**2420000**		

F. Year-wise Financial estimates for all Activities

S. No.	Items	Whether new construction or renovation or Equipment or soft component	State Proposal (Rs. In Lakhs)			
			2023-24	2024-25	2025-26	Total
1	Exhibit 1	Renovation	-	2677500	2536572	**52,14,072**
2	Exhibit 13	Equipment	14168064	14071600	14231980	**4,23,65,928**
3	Exhibit 9-12	Soft Component	10,00,000	7,08,356	7,20,000	**24,20,000**
	Total					**5,00,00,000**

G. Timeline for completion of project:

Phase	Items	Whether new construction or renovation or Equipment or soft component	Percentage of completion in the relevant phase	Physical Target		Financial Target	
				Start Date	End Date	Start Date	End Date
I		Renovation	100%	After Receipt of Grant	March 2025	After Receipt of Grant	March 2025

Phase	Items	Whether new construction or renovation or Equipment or soft component	Percentage of completion in the relevant phase	Physical Target		Financial Target	
				Start Date	End Date	Start Date	End Date
II		Equipment (Year 1)	100%	After Receipt of Grant	Dec 2024	After Receipt of Grant	Dec 2024
III		Equipment (Year 2)	100%	Oct 2024	Dec 2024	Dec 2024	March 2025
III		Equipment (Year 3)	100%	June 2025	November 2025	April 2025	June 2025
I		Soft Component (Year 1)	50%	December 2024	March 2025	November 2024	Feb 2025
II		Soft Component (Year 2)	30%	Nov 2024	April 2025	Oct 2024	March 2025
.III		Soft Component (Year 3)	20%	June 2026	November 2026	April 2026	June 2026

H. Courses proposed to be added:

Sl. No.	Department	Proposed Course	Duration	Enrolment Targets for the first year	Year-wise Enrolment Targets for first 5 years	Whether course approved by UGC	Whether sufficient faculty sanctioned for the course
1	BSc Data Science	UG	3	60	300	Yes	Yes
2	B.Sc. Artificial Intelligence	UG	3	60	300	Yes	Yes
3	Masters in E-Learning	PG	2	60	300	Yes	Yes
4	Masters in English	PG	2	60	300	Yes	Yes
5	Masters in Computer Science	PG	2	60	300	Yes	Yes

I. Pre-Collaboration with local industries for Research/ Internship/ Placements/ Apprenticeship:

1. If With existing Linkages: **Yes, Exhibit No.12:**
2. If With scope for linkage: Provide details
3. If Without Linkages:

J. The details of the Activities to be undertaken from the Suggestive List of Activities under the component as provided in Chapter VI of the Guidelines

Activity	How has it been Included in Tables above and reference of Table No. above	Details of how activity to be undertaken	Cost for the activity	Timeline for implementation of the activity
Adoption of Academic Bank of Credits				
Adoption of Multiple Entry and Exit				
Adoption of Guidelines on NHEQF				
Using ODL and Online Programmes such as SWAYM,/MOOCS				
Digital nodal centres for digitising academic content and resources delivering digital education such as SWAYAM and other MOOCs.	Exhibit 2 and 3	Setting up digital nodal centres for digitizing academic content and delivering digital education involves a series of activities that need to be undertaken to ensure the effective implementation and operation of the initiative. Here are the key activities involved: 1. Infrastructure Setup: With the help of grant received an apt infrastructure with reliable internet connectivity and backup power sources to minimize disruptions would be set up. 2. Resource Identification: Identify academic content, including	2714388	Phase I: December 2023: March 2024 (Infrastructure Set Up) Phase II and Phase III: Continual Trainings and Recordings

		textbooks, study materials, lecture notes, and other resources, that need to be digitized. So a dedicated team from various institutes would collaborate and curate digital resources. Ensure compliance with copyright and licensing agreements for all digitized materials. 3. Content Digitization: Scan and digitize physical content, converting it into digital formats such as PDFs, e-books, and multimedia presentations. Organize and categorize digitized content for easy access and retrieval. 4. Content Creation and Enhancement: Develop multimedia content, including videos, animations, simulations, and interactive modules, to enhance the learning experience. Collaborate with educators and instructional designers to create engaging and		

		effective online learning resources. 5. Creation of Online Courses: Create online courses by integrating digitized content, multimedia resources, assignments, quizzes, and assessments. Structure courses in a logical sequence that aligns with the curriculum and learning objectives. 6. Faculty Training: Train educators and instructors on how to use the digital platform effectively for content delivery, interaction, and assessment. Provide guidance on creating engaging online content and managing virtual classrooms. 7. Student Onboarding and Support: Orient students to the digital platform, explaining how to access content, submit assignments, participate in discussions, and take assessments. Offer technical support to address any issues students may encounter		

		during their online learning experience. 8. Quality Assurance: Review and validate the accuracy and quality of digitized content and online courses before making them available to students. Conduct usability testing to ensure that the platform and content are user-friendly and accessible. 9. Monitoring and Evaluation: Implement tracking and analytics tools to monitor student engagement, progress, and performance. Gather feedback from students and faculty to continuously improve the content and learning experience. 10. Promotion and Awareness: Create awareness among students and faculty about the availability of digital education resources and courses. Highlight the benefits of digital learning, such as flexibility, accessibility, and self-paced learning.		

		11. Collaboration with External Platforms: Collaborate with national and international digital education initiatives like SWAYAM and MOOCs to integrate their courses and resources into the platform. 12. Regular Updates and Maintenance: Keep the content up to date by regularly reviewing and updating materials to align with curriculum changes and advancements in the field. Perform routine maintenance of the platform, addressing technical issues and ensuring smooth operation.		
Internship/Apprenticeship Embedded Degree Programme				
Alumni Connect portal				
Adoption of Guidelines of UGC on Institutional Development Plan (IDP)				
Introduction and access to Online ERP portal (Samarth Portal) for faculties containing all academic working processes (Online information dashboard, timetable, examination allotment schedule, evaluation, and other academic activities)				

Evaluation Reforms by strengthening the 'Internal Quality Assurance Cell' (IQAC) of NAAC	Exhibit no 9, 10, 11 and 12	Rubrics for MOOC would be Developed along with those for activities under Soft Component	7,00,000 /-	Phase II May 2024-September 2024
Smart Classroom, Computer Lab, Wi-Fi Facilities	Exhibit no 2	Infrastructure Set-Up with simultaneous Trainings and Digitization of Content.	6977028 /-	Phase I: December 2023: March 2024 (Infrastructure Set Up) Phase II and Phase III: Continual Trainings and Recordings
Online training of teachers,	Exhibit no 9	Sessions on Innovative Teaching Pedagogy in collaboration with GAD TLC Ministry HRDC would be undertaken.	100000/ -	Phase I: December 2023: March 2024 Phase II and Phase III: Continual Trainings and Recordings
Setting up start-up incubation centers and technology development centers for skill-based courses with the help of Industries/Micro, Small & Medium Enterprises (MSME) at States/UTs level	Exhibit no 9, 10, 11 and 12			Phase II and Phase III: Continual Trainings and Recordings
Certification Courses embedded in teaching	Exhibit no 9, 10, 11 and 12			Phase I: December 2023: March 2024 (Infrastructure Set Up) Phase II and Phase III: Continual Trainings and Recordings
Well-equipped research laboratories, Digital libraries with subscriptions to reputed journals,	Exhibit no 9, 10, 11 and 12			
Bridge courses for SEDG students	Exhibit no 9	It is the outcome of the training Programs to be conducted	Outcom e of Equipm ent and SOft Compon ent activitie s	Phase II May 2024-September 2024
Online portal for student services (attendance, academic record, hostel-related services, complaint registration, etc.)				

Placement/ Training and Certification programmes, Structural Reforms according to the increased industry-ready courses, and industry-academia linkages	Exhibit 9-13	With the help of Linkages improved placement and Entrepreneurship is encouraged. Trainings would be provided by industry experts.	Outcome of Equipment and SOft Component activities	Phase II May 2024-September 2024
Construction/Renovation of Infrastructure of Institute				
Purchase of necessary Equipments for the institute	Exhibit no 13	It would lead to upgradation of various facilities explained in details under exhibits (: 2 - 12)	42471644	The equipment would be purchased as per the grants released under various heads to make sure project is completed in all the three phases.
Hostels and adequate toilet facilities for students specially for women/ transgenders, specially abled-friendly campus and special facilities	Exhibit no 1	Renovation along with Inclusion of Unisex washroom would be taken care off .	5100000	Phase I: December 2023: March 2024 (Infrastructure Set Up)
Opening of STEM courses	Exhibit no (9 - 12)	It is the outcome of various training programs and digital centre set up in the institute. Contribution towards Open Education Resources is planned.	720000	Phase III: June 2025 November 2025
Vocational courses for 21st century skills, Internships/Training, Innovation of new courses regarding Vocational education		The Vocational Courses pertaining to region specific to ensure holistic development of students as well as local populace are included in the soft training component. Experts in this arena would be empanelled to upgrade and revise the training programs to ensure		The Coureses would be implemented in tranches catergorized as follows - 1. Development of training modules and Curricullum for 6 courses with practical implementation and learning- November 2023 - Jan 2024 (Curriculum would be reviewed every 6 months henceforth)

		there exists no gaps. Lastly with help of collaborating agencies, research and IPR cell market mechanism and income generation aspects would be taken care off. Thus blending the concept of "LOCAL SE VOCAL" is coined to be accomplished.		2. Course Delivery - Feb 2024 onwards 3. Development of Training Modules and Curriculum for 6 courses pertaining to marketing and sale of Agro based products so developed. November-September 2024-October 2024. 4. Commencement of Courses from November 2024 onwards.
Any other Activity from the Activities List				

SECTION 5: PROPOSED OUTCOMES:

Targets to be set while submitting proposal and achievements to be submitted Quarterly					
	Indicators	**Base Year *(Mention year)* Figures**	**Target for 31.03.2024**	**Target for 31.03.2025**	**Target for 31.03.2026**
Outcome	% Increase in number of Students enrolled (UG/PG/PhD) compared to base year	**5077**	**15%**	**20%**	**25%**
	Number of ICT-Based Digital Infrastructures undertaken under the project	**06**	**12**	**16**	**18**
	If unaccredited, then Whether institution gets accreditation	**NA**	**NA**	**NA**	**NA**
	If accredited, then whether institution increases in accreditation score	**B**	**A+**	**A+**	**A+**
	Number of Campus placement sessions to be held for last semester students (Cumulative figures starting from year of approval)	**725**	**850**	**900**	**1000**
Output	Whether project completed		**YES**	**YES**	**YES**

C. Other sources of funds for the institution:

S. No.	Organisation/ Project/ any other Scheme	Amount	Activities supported
1	--	--	--
	Total		

1. The Institution/State undertakes that there will be no duplication of items of expenditure between the sources of funding:

SECTION 6: OTHER SOURCES OF FUNDS FOR THE INSTITUTION:

Sr. No.	Organisation/ Project/ any other Scheme	Amount	Activities supported
1	Assistance for S & T Applications of Rajiv Gandhi	10,00000/-	**Sanctioned Research Project proposal –**

	Science and Technology Commission, Government of Maharashtra		1) Sustainable and and Scalable Protocol for Isolation of Camptothecin, an Anti-cancer Agent, using Local Flora of Palghar District (Dr. Dilip Yadav, Assistant Professor, Department of Chemistry) 2) Development of eco-friendly and nanoporous phosphorous doped carbon nitride aerogel electrocatalysts for hydrogen production (fuel) through water splitting. (Dr. Sapna Jadhav, Assistant Professor, Department of Physics)
	Total	**10,00000/-**	

1. The College undertakes that there will be no duplication of items of expenditure between the sources of funding

SECTION 7: ENCLOSING DOCUMENTS

Please enclose all relevant documents to support the DPR, architectural blueprints and elevation diagrams, maps of the land signed by the competent authority etc. for the proposal.

SECTION 8: COMMITMENTS:

A. Adequate Girls hostels and Girls Toilets
B. Follow the state reservation policy
C. Building to be disabled friendly and also ensure special facilities/equipment for the disabled
D. Adequate per-student provisions for classrooms, library and laboratory facilities
E. Inclusion of ICT in teaching-learning process and provision of internet access to all students
F. Implementation of all academic, examination and governance reforms
G. Aim to achieve a better student-teacher ratio (within a time-frame)
H. Aim to achieve a better Teaching to Non-Teaching Staff (within a time-frame)
I. All the recurring expenditures (including salaries) and non-recurring expenditures beyond the scope of the approval under the scheme would be met by the State Government.

Note again:

1) Maximum Central Grant will be limited to the State/ UT's funding ratio for the approval under the Scheme.
2) State/Institution will bear the excess expenditure over and above the Central share

I verify that all the data entered above are true and correct to my knowledg

(Dr. Kiran J. Save)
Principal
Signature of the Head of the Institute

PALGHAR DIST. PALGHAR

PRINCIPAL
Sonopant Dandekar Arts College,
V.S. Apte Commerce College &
M.H. Mehta Science College
PALGHAR (W.R.)
Dist. Palghar, Pin-401404

SCORING AND RECOMMENDATION BY THE STATE/UT

The score received by the above proposal as per the short-listing criteria given in the guidelines is as follows:

ONLY STATE GOVERNMENT AND GOVERNMENT-AIDED COLLEGES WILL BE ELIGIBLE

Short Listing Criteria Indicators & Weights:

A. Priority would be given to units in the Focus Districts

S. N.	Indicator	Weights	Score received by the Unit
1	Situated in Focus Districts	100 marks	**100**
2	Not situated in Focus Districts	10 marks	**--**

B. Prior support under any Phases of RUSA

(i) **Approval/amount approved** means Total Approval (including Central and State share) of the all the number of times the unit has been approved under all the phases of RUSA under all the components.

(ii) **Completion certificate** means Completion Certificates for all number of times the unit has been approved under all the phases of RUSA under each component i.e. Submission of Completion certificate for less than the number of approvals will not be considered

S. N.	Indicator	Weights	Score received by the Unit

1	College has not been previously approved under any component of RUSA	100 marks	**100**
2	Approval only once under RUSA but not released any central share by Ministry, so far	80 marks	--
3	Approval either once or more under RUSA but has already utilised the full amount approved and has submitted completion certificate	40 marks	--
4	Approval only once under RUSA but full amount approved not yet utilised and completion certificate not yet submitted	10 marks	--
5	Approval more than once under RUSA but full amount approved not yet utilised and completion certificate not yet submitted	5 marks	--

C. Students Enrolment: College with more Student Enrolment would be given preference with the following weightage:

S. No.	Indicator	Weights	Score received by the Unit
1	More than 2,500	60 marks	**60**
2	2000-2499	50 marks	--
3	1500-1999	40 marks	--
4	1,000-1499	30 marks	--
5	Below 1,000	20 marks	--

D. Number of Departments in College: College with more number of Departments would be given preference with the following weightage:

S. No.	Indicator	Weights	Score received by the Unit
1	15 or More than 15	40 marks	**40**
2	11-14	30 marks	--
3	5-10	20 marks	--

E. Department-wise Faculty Positions filled in regular mode: Colleges with large faculty positions filled in regular mode would be given preference with the following weightage:

(Each Department data would be filled separately)

S. No.	Indicator	Weights	Score received by the Unit
1	Above 85% of sanctioned faculty positions	30 marks	--
2	80-84.9% of sanctioned faculty positions	25 marks	--
3	70-79.9% of sanctioned faculty positions	20 marks	--
4	60-69.9% of sanctioned faculty positions	15 marks	**15**
5	50-59.9% of sanctioned faculty positions	10 marks	--
6	Below 50% of sanctioned faculty positions	5 marks	--

F. Department wise Student-Teacher Ratio: College with the minimum gap of Student-Teacher Ratio would be given preference with the following weightage:

(Each Department data would be filled separately)

S. No.	Indicator	Weights	Score received by the Unit
1	Between 1:1 – 1:19	30 marks	**--**
2	Between 1:20 – 1:29	25 marks	**--**
3	Between 1:30 – 1:39	20 marks	**--**
4	Between 1:40 – 1:60	15marks	**15**
5	Below 1:60	5 marks	**--**

G. Collaboration with local industries for Research/ Internship/ Placements/ Apprenticeship with the following weightage:

S. No.	Indicator	Weights	Score received by Unit
1	With existing Linkages	25 marks	**25**
2	With scope for linkage	15 marks	
2	Without Linkages	0 marks	

The total score received by the Proposal of the above institution is given in the box below**:**

355

The above proposal of_____ Under the component of _____
For an amount of Rs _____ is recommended by the State for consideration under the scheme of PM-USHA

I verify that all the data entered above are true and correct to my knowledge

Signature and Stamp of the Administrative Secretary of the Higher Education Department of State/UT

Sonopant Dandekar Shikshan Mandali's

SONOPANT DANDEKAR ARTS, V.S. APTE COMMERCE AND M.H. MEHTA SCIENCE COLLEGE, PALGHAR

PRADHAN MANTRI UCHCHATAR SHIKSHA ABHIYAN (PM-USHA)

EXHIBIT-1

Details of Infrastructure proposed to be Renovated/ Upgradation

Prepared by : Internal Quality Assurance Cell

Renovating and upgrading the existing Ladies' Washrooms, and Gents Washrooms as well as introducing Unisex in a rural higher educational institute, can be justified through several important reasons:

1. **Gender Equality and Inclusivity:** Providing equal and inclusive facilities for all genders is essential in any educational institution. The presence of separate washrooms for each gender, along with the addition of unisex washrooms, demonstrates our commitment to promoting gender equality and creating an inclusive environment.

2. **Diversity of Students and Staff:** As educational institutions attract students and staff from diverse backgrounds, cultures, and preferences, it's crucial to accommodate the various needs of these individuals. A mix of washroom facilities ensures that everyone feels comfortable and respected, regardless of their gender identity.

3. **Privacy and Safety:** Proper washroom facilities enhance privacy and safety for all users. Women and girls often have specific hygiene and safety needs, which a well-equipped ladies' washroom with sanitary pad vending machine with incinerator can address. Additionally, providing separate facilities for men and women can help reduce instances of discomfort and potential safety concerns.

4. **Hygiene and Health:** Washrooms play a significant role in maintaining good hygiene and health. Well-maintained and clean facilities are important for preventing the spread of infections and diseases, which is particularly crucial in educational settings where a large number of people interact daily.

5. **Enhanced Campus Experience:** Upgraded and modern washrooms contribute to an improved overall campus experience. Students, staff, and visitors will have a more positive perception of the institute when they find the necessary facilities up to date and well-maintained.

6. **Compliance with Regulations:** Many educational institutions are subject to regulations and guidelines related to building codes, accessibility standards, and gender-neutral facilities. Ensuring compliance with these regulations not only avoids

potential legal issues but also reflects the institute's commitment to following best practices.

7. **Positive Image and Reputation:** Investing in the renovation and addition of washrooms demonstrates the institution's dedication to providing quality facilities and services to its community. This commitment can enhance the institute's reputation, attract potential students and faculty, and strengthen relationships with stakeholders.

8. **Long-Term Cost Savings:** While the initial investment for renovation and construction might seem significant, the long-term benefits often outweigh the costs. Properly designed and well-constructed facilities tend to require less maintenance and repairs over time, leading to cost savings in the future.

In conclusion, the renovation and upgradation of ladies' washrooms, along with the introduction of unisex and gents washrooms, are justified by the principles of equality, inclusivity, hygiene, safety, and overall campus improvement. These changes reflect a commitment to the well-being and satisfaction of all members of the educational community while aligning with modern standards and regulations.

Sonopant Dandekar Shikshan Mandali's

SONOPANT DANDEKAR ARTS, V.S. APTE COMMERCE AND M.H. MEHTA SCIENCE COLLEGE, PALGHAR

PRADHAN MANTRI UCHCHATAR SHIKSHA ABHIYAN (PM-USHA)

EXHIBIT-2

Details of Equipment to be Procured

Upgrading Traditional Classrooms to Smart Classrooms

Prepared by : Internal Quality Assurance Cell

Proposal for Upgrading Traditional Classrooms to Smart Classrooms

1. NEED AND IMPORTANCE

The education sector has seen a noticeable increase in educational standards, advancement and innovations in recent years. Schools and other educational institutions have begun to adopt modern teaching methods through interactive intelligent boards, projectors and smart notebooks, etc. These technological updates make the education system more interactive and easier. On the other hand, this smart technology helps teachers to turn boring lectures into an engaging session.

A smart classroom is an innovative learning environment that integrates technology and interactive teaching methods to enhance the educational experience for students and educators. It goes beyond traditional classrooms by incorporating digital tools and resources to create a dynamic and engaging learning space.

Setting up smart classrooms in Rural and Adivasi areas where institute is located aligns with the objectives and principles outlined in the New Education Policy (NEP) 2020. The NEP envisions a transformative and inclusive education system that emphasizes equitable access to quality education for all learners.

Here's how setting up smart classrooms in the institute corresponds with the key goals of the NEP:

a. **Equitable Access to Quality Education:** Smart classrooms can bridge the digital divide by providing students in rural areas with access to high-quality educational content, digital resources, and interactive learning experiences that were previously limited to urban areas.

b. **Technology-Enabled Learning:** The NEP promotes the integration of technology in education to enhance teaching and learning outcomes. Smart classrooms in rural areas can leverage technology to make learning more engaging, interactive, and student-centered.

c. **Flexible and Multidisciplinary Learning:** Smart classrooms facilitate the use of multimedia content, interactive simulations, and digital resources that support multidisciplinary and experiential learning, allowing students to explore various subjects and concepts in depth.

d. **Local Context and Cultures:** Smart classrooms can be customized to incorporate local languages, cultures, and contexts, ensuring that learning materials are relevant and meaningful to students in rural areas.

e. **Teacher Empowerment and Professional Development:** The NEP emphasizes continuous professional development for teachers. Smart classrooms can provide teachers in rural areas with training on effective use of technology, innovative teaching methods, and digital content creation.

f. **Holistic Development:** Smart classrooms can facilitate holistic development by providing access to a wide range of learning resources, including arts, music, sports, and vocational skills, which are essential for the overall development of students.

g. **Assessment Reforms:** Smart classrooms enable real-time assessment and feedback, aligning with the NEP's focus on formative and continuous assessment methods that support student understanding and skill development.

h. **Inclusive Education:** Smart classrooms can cater to diverse learning needs, including those of differently-abled students, by incorporating accessibility features and adaptive technologies.

i. **Global Exposure:** Smart classrooms can connect students in rural areas with online courses, webinars, and virtual guest lectures, providing exposure to a global educational landscape.

Incorporating smart classrooms into rural education aligns with the NEP's vision of creating an inclusive, technologically advanced, and learner-centric education system that empowers students to become well-rounded individuals capable of contributing to society.

0. Objectives for Upgrading Traditional Classroom to Smart Classroom

O_1 – Provide access to digital resources and databases for students to retrieve information and concepts.

O_2 – Present complex concepts through multimedia presentations and interactive visuals to facilitate understanding.

O_3 – Design interactive projects and collaborative activities that require students to combine information from various sources to create new solutions or products.

O_4 – Incorporate case studies and real-world examples to demonstrate how concepts are used in various contexts.

Thus, integration of technology and interactive tools promotes higher-order thinking skills and a more comprehensive educational experience for students.

1. Components of Smart Classroom

. Interactive Panel with 85 inch display for classroom with area size 750 sqfeet-1000 sqfeet.
Net Gear Wi-Fi Router
Ahuja Small Speaker

2. Components of Office Digitization

NEP 2020, not only strives for quality education for the learners and development of teachers but also emphasizes on the outcome- based education, transparency and accountability. Aligning this goal, the institute envisages to empower its administrative staff with improved infrastructure and complete ERP system with transparency that not

accounts for funds but also maintains learners' data for mapping its progress. It further proposes to support data analytics and improve use of ICT tools. Further, this revision is looked upon since the alternate smart classrooms technology have come at lower price due to favourable budget (Financial Budget 2024) for technology education. As a result new companies have diversified into the same arena at lower prices. So the balance funds would now be utilized towards office digitization. **(Exhibit-2)**

0. Infrastructure Required

Sl. No.	Name of the Equipment	Quantity	Cost per Unit	Total Cost
A.	**Upgrading Traditional Classrooms to Smart Classrooms**			
	Interactive panels Samsung WM 85A Flip	20	141900	30,00,000
	Ahuja Small Speaker	20	3600	72,000
	Total			**3072000**
B.	**Office Digitalization**			
	Server	2	545000	1090000
	RAM	6	17000	102000
	SSD (1TB)	2	9500	19000
	Win Server 2019 Windows License edition	2	24650	49300
	NAS Box (4 TB)	2	45676	91352
	Online UPS (APC SRV5KRIL-IN 5000 VA Sine Wave UPS)	2	139990	279980
	Personal Computers for Office	30	58990	1769700
	Individual UPS for Personal Computers	30	3000	90000
	Manageable Switch	4	25999	103996
	Firewall FortGate	2	85000	170000
	AC for Server Room (1.5 Ton)	2	42500	85000
	MS-Office 2021 STD License	2	23600	47200
	Networking Rack	2	12500	25000
	CAT-6 Network Cable	4	8000	32000
	NET GEAR WIFI ROUTER	12	7499	89988
	CAL License for Server	30	750	22500
	Total			**40,67,016**

0. List of Classroom and Area Size to be upgraded

Sr. No	Classroom No	Area
1	BMS-06	505 Sq.ft.
2	BMS-07	847 Sq.ft.
3	BMS-08	847 Sq.ft.
4	BMS-09	847 Sq.ft.
5	BMS-10	847 Sq.ft.
6	BMS-11	847 Sq.ft.
7	New Building-9	800 Sq.ft.
8	New Building-10	800 Sq.ft.
9	New Building-11	800 Sq.ft.
10	New Building-12	800 Sq.ft.
11	New Building-13	800 Sq.ft.
12	New Building-14	800 Sq.ft.
13	New Building-15	800 Sq.ft.
14	New Building-16	800 Sq.ft.
15	New Building-17	800 Sq.ft.
16	New Building-18	800 Sq.ft.
17	New Building-19	800 Sq.ft.
18	New Building-20	800 Sq.ft.
19	New Building-21	800 Sq.ft.
20	New Building-22	800 Sq.ft.

0. Quotation

STUDIO SWASTIKA
ARCHITECTURE FIRM

+91 7410000738
swastika.design.studio@gmail.com
Shop No. 7, 1st Floor, Ganesh Ashish Bldg, Above Jagadamba Hotel, Mahim Road, Palghar(W), 401404

Date:23.08.23

Subject : Quotation/Estimate for Renovation of Toilets & Common Rooms at Dandekar College Palghar (W)

ITEM NO.	DESCRIPTION	QTY.	UNIT	RATE PER UNIT	AMOUNT
1	**MATERIAL**				
	CEMENT BAGS	50	NOS	400	20000
	TILES AREA IN SQ.FT	11000	SQ.FT	55	605000
	SPACER BAGS	5	NOS	500	2500
	GRANITE SLAB SQ.FT	100	SQ.FT	200	20000
	ARELDITE IN LITRE	9	LITRE	900	8100
	ELFY	36	NOS	30	1080
	3/4" UPVC LINE (PRINCE)	1500	R.mtr	96	144000
	3" PVC LINE (PRINCE)	600	R.mtr	225	135000
	WATERPROOFING	1200	SQ.FT	500	600000
	Internal And External FRP depressed or Wooden Panel doors	32	NOS	1400	44800
	PVC angle adjustable louvers	17	NOS	400	6800
	SS TABLES & BENCHES	12	NOS	15000	180000
2	**FIXTURES**				
	SPOUT	22	NOS	700	15400
	FAUCET	10	NOS	1500	15000
	BASIN	10	NOS	2000	20000
	ANGLE VALVE	45	NOS	1750	78750
	WC + CONCEALED FLUSH	22	NOS	11500	253000
	TOWEL RING	10	NOS	800	8000
	SOAP DISPENCER	10	NOS	500	5000
	TOILET PAPER HOLDER	22	NOS	500	11000
	HAND SHOWER	10	NOS	2500	25000
	HEALTH FAUCET	22	NOS	1500	33000
	DRAIN JALI	30	NOS	300	9000
	CP JALI	10	NOS	350	3500
	BOTTLE TRAP	10	NOS	750	7500
	ELECTRIC WORK CONTRACT 250rs/sq.ft with MATERIAL	2200	SQ.FT	250	550000
3	**LABOUR COST**				
	TILE FITTING AREA IN SQ.FT 50rs/sq.ft	11000	SQ.FT	50	550000
	PLUMBING LABOUR	10	NOS	27493	274930
	PAINTING AREA RATE 25rs/sq.ft	18000	SQ.FT	40	720000
	TILE GROUTING	10	NOS	6000	60000
	SUB TOTAL				4406360
4	**OVERHEAD 20%**				
	DEMOLITION OF OLD DAMAGED AREAS				
	LABOUR FOR DIBRIS REMOVAL				
	MATERIAL TRANSPORT				5287632
	MIRRORS				
	CLEANING AFTER COMPLITION				
	MAINTENANCE OF EXISTING SERVICES LIKE CHAMBERS AND SEPTIC TANK				
5	**CONTINGENCIES 3-5%**				5552013.6
6	**INTERIOR DESIGNING,PLANNING & SUPERVISION 10% OF THE COST**				555201.36
	TOTAL COST				6107214.96
	TOTAL LUPSUM COST				**6100000/- Rs.**

RATES are as per DSR
THANK YOU !

08/09/2023

Ar. SHUBHAM KIRAN PATIL
Registration No. CA/2021/132668

Proposal for Setting up Nodal Digital Centre for Development of MOOC's and Online programs.

1. **Need and Importance for Setting up Nodal Digital Centre**:

Developing a MOOC (Massive Open Online Course) recording center in an institute that is located in a rural area has several significant benefits aligning the objectives of National Education Policy 2020. Here are some reasons why such a center could be valuable:

. Access to Quality Education: Rural areas often lack access to high-quality education and experienced instructors. A MOOC recording center can help bridge this gap by bringing in expert educators to create online courses. This enables students in rural areas to access the same quality of education as their urban counterparts.

a. Diverse Course Offerings: MOOCs cover a wide range of subjects, from sciences to humanities, technology to arts (STEAM). Setting up a recording center allows the institute to offer a diverse set of courses that might not be available locally. This enables students to explore their interests and passions.

b. Skill Enhancement: MOOCs often offer courses on practical skills and employable subjects. Developing a MOOC recording center could help students in rural areas acquire skills that are relevant to local job markets or emerging industries.

c. Cost-Effective Education: Online courses can often be more affordable compared to traditional classroom-based education. This can reduce the financial burden on students who might come from economically disadvantaged backgrounds.

d. Community Engagement: The recording center can become a hub for community engagement. It can host workshops, seminars, and discussions related to education, technology, and local issues, fostering a sense of learning and collaboration within the community.

e. Research and Innovation: The institute can use the MOOC recording center to showcase its own research and innovations. Faculty members can create courses related to their areas of expertise, thereby enhancing the institute's academic reputation.

f. Digital Literacy: The establishment of a MOOC recording center can contribute to improving digital literacy in the community. Students and community members will learn how to access and navigate online resources effectively.

0. Objectives for Developing a Digital Video Centre

O_1 - To facilitate the recording of foundational knowledge and facts that form the basis of various subjects.

Example: Create video lectures that present key concepts, definitions, and historical facts in a clear and concise manner.

O_2 - To help learners grasp the meaning of information and concepts by providing explanations and examples.

Example: Develop video content that breaks down complex ideas into simpler terms, accompanied by real-world scenarios for better comprehension.

O_3 - To enable learners to apply knowledge and concepts in practical situations.

Example: Produce videos that demonstrate how theoretical concepts can be applied in real-life situations or problem-solving scenarios relevant to the rural context.

O_4 - To promote the creation of new ideas, solutions, or perspectives by combining existing knowledge.

Example: Produce videos that challenge learners to synthesize information from multiple sources to propose innovative solutions to local challenges.

This approach ensures that the content caters to various learning styles and engages learners in meaningful ways, ultimately enhancing the impact of the MOOC and ODL initiatives in the institute.

0. Activities Proposed/ Expected Outcomes :

. **Content Creation and Design** with help of experts thereby leading to creation of multimedia content such as video lectures, interactive simulations, quizzes, and assessments.

a. **Setting up a recording studio** with proper lighting, audio equipment, and cameras to produce high-quality video lectures.

b. **Explore and utilize learning management systems (LMS)** or online platforms to host and deliver the courses.

c. Offer training sessions for faculty members on effective online teaching strategies, pedagogical principles, and best practices in course design. **(STEAM Based Education)**

d. Market and promote the MOOCs and online programs through various channels to **reach a wider audience** with help of collaboration with other institutes.

e. **Sharing of resources** with other institutes by signing Memorandum of Understanding.

f. Organize workshops and **training sessions** for faculty members to enhance their digital teaching skills and online course development capabilities.

By conducting these activities, the digital center can ensure the creation of effective, engaging, and accessible online courses that align with the goals of the MOOC and online program initiatives in the rural higher education institute.

0. Proposed Area for Setting up Digital Recording Centre.

0. List of Collaborating Institutes (Non- Exhaustive) wherein resources would be shared.

0. Quotation

0. Concluding Remarks

Ultravision - (C)

Ground Floor, 1A/197/199, Dawar House,
HAndloom House, Fort, Grant Road,
Mumbai Maharashtra 400001
India
GSTIN 27AAAPR7795M1ZT

ESTIMATE

#	: **EST-000098**	Place Of Supply	: **Maharashtra (27)**
Estimate Date	: **19-08-2023**		

Bill To

Principal Sonopant Dandekar College, Palghar

#	Item & Description	HSN /SAC	Qty	Rate	CGST		SGST		Amount
					%	Amt	%	Amt	
1	CANON DIGI. EOS R6 MARK II 24-105 USM WITH AC CABLE	85258900	1.00	2,75,000.00	9%	20,974.58	9%	20,974.58	2,75,000.00
2	NX 200 Video camera	85258900	1.00	1,89,000.00	9%	14,415.25	9%	14,415.25	1,89,000.00

Total In Words
Indian Rupee Four Lakh Sixty-Four Thousand Only

Sub Total (Tax Inclusive)	4,64,000.00
CGST9 (9%)	35,389.83
SGST9 (9%)	35,389.83
Total	**₹4,64,000.00**

Looking forward for your business.
WITH BILL GST
Bank Details
name ULTRA VISION
IFSC code . HDFC0000355
Fort branch
Hdfc current account
Account no. 50200001392184
Contact 9820150071
Email ID : ultra.vision.org.@gamil.com

Company

Authorized Signature

POWERED BY ZOHO

1

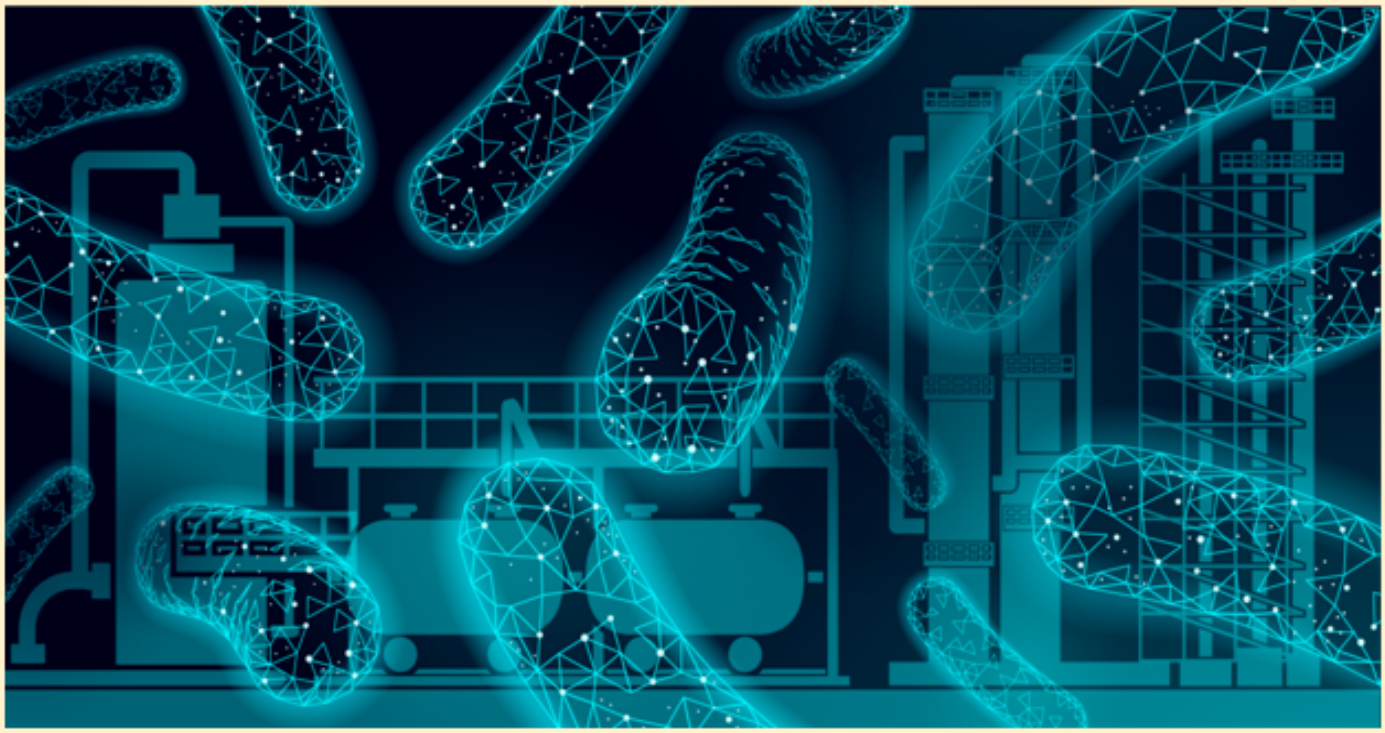
Sonopant Dandekar Shikshan Mandali's

SONOPANT DANDEKAR ARTS, V.S. APTE COMMERCE AND M.H. MEHTA SCIENCE COLLEGE, PALGHAR

PRADHAN MANTRI UCHCHATAR SHIKSHA ABHIYAN (PM-USHA)

EXHIBIT - 4

Details of Equipment to be procure



Department of

BIOTECHNOLOGY

Prepared by : Internal Quality Assurance Cell

LIST OF EQUIPMENT TO BE PROCURE

SR. NO.	NAME OF THE INSTRUMENT	JUSTIFICATION/USE OF INSTRUMENT	COST OF THE INSTRUMENT	BROCHURE LINK
1.	HPLC	For analyzing complex mixtures, purification of chemical and biological samples, for analyzing air and water pollutants, to determine concentration of biologic samples.	Hitachi- 18 lakh Model Name/Number: Primaide Usage/Application: Laboratory Use Application: QA/QC Laboratory Brand: Hitachi DIMENSION: STANDARD	https://www.hitachi-hightech.com/file/us/pdf/library/literature/Primaide_Brochure-HTB-E092.pdf
2.	PCR	For amplification of genomic DNA,restriction fragment length polymorphism and DNA sequencing in Ty, Msc and research	Thermo-Fisher- 1.5 lakh Brand: Thermo Fisher Capacity: 96 wells Temperature Range: 0-100 Degree Celsius Format: 96-well plate For Use With: Applied Biosystems GeneAmp plastics consumables High Throughput Compatibility: High Throughput-Compatible	https://static.fishersci.eu/content/dam/fishersci/en_EU/suppliers/Thermo%20Scientific/Thermo-fisher-scientific-life-science/thermal-cycler.pdf
3.	Flame photometer	For soil analysis practicals for Post graduation students and for research purpose	IGene Labserve Private Limited 3,26,600/-	https://pdf.indiamart.com/impdf/25910497048/21704170/flame-photometer.pdf
4.	**Cooling Centrifuges PLUS, Capacity: 1200 Ml** RPM- 20,000	for Research and Microbiological experiments, Analysis of food, tissue samples, For amplification of genomic DNA,restriction fragment length polymorphism and DNA sequencing in Ty, Msc and research	4,00,000/- **REMI**	https://www.indiamart.com/proddetail/remi-refrigerated-centrifuges-plus-3070272962.html
5.	Elisa reader with kit and accessories	to perform a quantitative ELISA assay for hepatitis B, chikungunya, and other infectious diseases like · **Infectious Diseases:** HIV, HBsAg, HCV, Syphilis, Malaria, Leptospira, Chikungunya **Hepatits A:** Anti-total HAV, Anti-HAV IgM **Hepatitis B:** Anti-HBs, Anti-HBc, Anti-HBc IgM for study in SY and MSc part 2.	Accessories Accessory - Lamp 6V/10W(Termofisher)- 30,000/- 5,00,000/- Microplate reader (Termofisher) + Kits + 5,00,000/-	https://www.thermofisher.com/order/catalog/product/VLBLATGD2?SID=srch-srp-VLBLATGD2

6.	Anaerobic Rotary shaker with temperature control	For cultivation of anaerobic organisms from environmental samples for environmental analysis and for fermentations biotechnology practicals atB.Sc, MSc,. For PhD research work	Scigenics Biotech Private ltd.-17.5/-lakhs Model-MODEL: LE4676	https://scigenicsbiotech.com/wp-content/uploads/2023/06/Lab-plus-incubator-Shaker.pdf
7.	Double beam uv spectrophotometer	Analysis of food, tissue samples in food biotechnology practicals at MSc,. For PhD research work	5,50,000/- BR Biochem Life Sciences Private Limited Or Shimadzu	https://www.toshvin.com/wp-content/uploads/2020/03/UV-3600i-Plus.pdf
8.	Vertical Laminar Airflow Unit	For maintaining aseptic conditions for all Research and Microbiological experiments conducted as per the curriculum.	7,00000/- **Scineers Scientific India Pvt Ltd. - 2 lakhs**	https://pdf.indiamart.com/impdf/16419776173/20793661/biosafety-cabinet-class-ii-type-a2.pdf
9.	Biosafety Cabinet	Biosafety Cabinets are commonly used in research applications involving biotechnology microbiology, molecular biology, and cell culture work	385000/- **Top Air Systems**	https://pdf.indiamart.com/impdf/23417412273/31301476/top-air-biological-safety-cabinets.pdf

1 HPLC

High-performance liquid chromatography (HPLC) is a technique in analytical chemistry used to separate the components in a mixture, and to identify and quantify each component.

HPLC has many applications in both laboratory and clinical science. It is a common technique used in pharmaceutical development, as it is a way to obtain and ensure product purity.

HPLC assays can be performed for research purposes for detection of concentrations of potential clinical candidates. It is used as a method to confirm results of synthesis reactions, as purity is essential in this type of research.

The most important aspect of HPLC is the high separation capacity which enables the batch analysis of multiple components. Even if the sample consists of a mixture, HPLC will allow the target components to be separated, detected, and quantified. Also, under appropriate conditions, it is possible to attain a high level of reproducibility with a coefficient of variation not exceeding 1%. Also, it has a high sensitivity while a low sample consumption.

Model Name/Number: Primaide

Usage/Application: Laboratory Use

HPLC in Pharmaceutical/Biopharmaceutical-

The pharmaceutical industry is one of the biggest users of HPLC. They use it primarily to check the purity and consistency of the products they make. They also use it to:

- Evaluate formulations
- Monitor how changes to a product or scaling up production affects the product
- Separate out compounds to be used in the production of new drugs
- Characterize molecules that can be used to manufacture new drugs

HPLC in Clinical Research/Toxicology-

HPLC is a highly accurate method for analyzing the nutrient composition of blood (such as testing for vitamin D) and for analyzing other types of clinical research samples, such as:

- Urine and blood for the presence of antibiotics
- Bilirubin and biliverdin analysis for hepatic disorders
- Endogenous neuropeptides in cerebrospinal fluid

HPLC in Food Safety and Food Quality-

- When it comes to the production of food, HPLC can be used to analyze samples to determine the makeup of the chemicals used in agriculture and food production.
- Pesticides and food additives can be identified and quantified to determine the safety of a food product.
- It can also be used to determine the quality of water and soft drinks, analysis the sugars in fruit juices, and analyze the polycyclic compounds present in vegetables.

HPLC in Environmental Analysis-

- When it comes to the environment, HPLC is helpful in the bio-monitoring of pollutants and pollution levels and the detection of phenolic compounds in drinking water.
- Environmental samples can include waste water, drinking water, soil, sediments, and many more diverse matrices.

Academic uses of HPLC-

- HPLC is one of the important analytical techniques included in the biotechnology syllabus.
- Instrumentation and working of HPLC is included in SY and TY Biotechnology syllabus.
- HPLC instrument is required by MSc biotechnology students for analysis of biological samples and to check the purity of products.

Brand: Hitachi

Cost: 68 lakh

2	PCR

What exactly is PCR, and how is it beneficial

PCR Polymerase Chain Reaction (PCR) is a powerful molecular biology technique that is widely used for amplifying specific DNA sequences. It has numerous applications across various fields due to its sensitivity, specificity, and versatility. Principle: PCR is a molecular biology technique used to amplify a specific DNA segment, making multiple copies of it through a cyclic process. It involves three main steps: denaturation, annealing, and extension.

1. Denaturation: In the first step, the DNA template is heated to around 94-98°C. This causes the double-stranded DNA to separate (denature) into two single strands. This step ensures that the DNA strands are available for binding to primers.

2. Annealing: The reaction temperature is lowered to around 50-65°C. During this step, short DNA primers (oligonucleotides) that are complementary to sequences flanking the target region bind to the single-stranded DNA template. These primers serve as starting points for DNA synthesis.

3. Extension (Elongation): The temperature is raised to around 72°C. A heat-stable DNA polymerase enzyme (e.g., Taq polymerase) adds complementary nucleotides to the 3' end of the primers, synthesizing new DNA strands that are complementary to the template strands.

These three steps constitute one PCR cycle. By repeating the cycle multiple times, the target DNA segment is exponentially amplified, resulting in millions to billions of copies of the desired DNA fragment.

Components and Reagents:

• DNA Template: The initial DNA segment to be amplified.

• Primers: Short single-stranded DNA molecules that are complementary to the sequences flanking the target DNA region.

• DNA Polymerase: Enzyme responsible for synthesizing new DNA strands. Taq polymerase, derived from the thermophilic bacterium Thermus aquaticus, is often used due to its heat stability.

• Nucleotides: Building blocks (A, T, C, and G) required for DNA synthesis.

• Buffer Solution: Provides optimal conditions for enzyme activity and DNA stability.

• Magnesium Ions (Mg^{2+}): Essential co-factor for DNA polymerase activity.

Here are some detailed uses of PCR along with their advantages:

1. Gene Cloning: PCR is used to amplify specific DNA fragments for cloning into vectors. Advantages include:

• Rapid generation of large amounts of DNA for cloning.

• Can amplify rare or degraded DNA samples.

2. Molecular Diagnostics: PCR is extensively used for detecting and identifying infectious agents and genetic mutations. Advantages include:

• High sensitivity allows detection of low amounts of target DNA.

• Specific primer design enables differentiation between closely related sequences.

• Rapid turnaround time for clinical results.

3. Genetic Testing: PCR-based techniques like allele-specific PCR and real-time PCR are used to detect genetic mutations associated with diseases. Advantages include:

• Accurate detection of specific mutations.

• Early diagnosis of genetic disorders.

4. Forensic Analysis: PCR helps amplify DNA from crime scene samples, even when the amount is limited. Advantages include:

• Ability to analyze minute amounts of DNA.

• Aid in identifying suspects and victims.

5. Phylogenetic Studies: PCR is used to amplify and sequence specific gene regions for evolutionary and taxonomic studies. Advantages include:

• Generation of DNA sequences for building phylogenetic trees.

• Comparative analysis of genetic diversity.

6. Environmental Microbiology: PCR can identify microorganisms from environmental samples by amplifying their DNA. Advantages include:

• Ability to study microbial diversity without culturing.

• Detection of rare or unculturable microorganisms.

7. Transgenic Organism Analysis: PCR can detect the presence of transgenes in genetically modified organisms. Advantages include:

• Ensures the presence of desired genetic modifications.

• Helps in regulatory compliance for genetically modified crops.

8. Viral Load Quantification: Real-time PCR is used to quantify viral RNA/DNA in clinical samples. Advantages include:

• Precise quantification of viral load for disease prognosis.

• Monitoring of antiviral therapies.

9. DNA Sequencing Template Preparation: PCR is used to generate templates for DNA sequencing reactions. Advantages include:

• Amplification of specific regions of interest for targeted sequencing.

• Efficient template preparation for high-throughput sequencing platforms.

10. Mutation Detection: PCR-based methods can identify mutations by amplifying target regions and comparing them to reference sequences. Advantages include:

• Detection of point mutations, insertions, and deletions.

• Valuable in research and clinical settings for identifying disease-causing mutations.

Detailed Applications:

1. Pathogen Detection and Diagnosis: PCR plays a crucial role in detecting infectious agents such as bacteria, viruses, and parasites in clinical samples. Its sensitivity and specificity allow for accurate identification of pathogens responsible for diseases like COVID-19, HIV, tuberculosis, and more. This aids in timely treatment and disease management.

2. Cancer Research and Diagnosis: PCR is employed to detect genetic mutations, gene expression patterns, and epigenetic changes associated with cancer. It enables researchers to identify oncogenes, tumor suppressor genes, and potential therapeutic targets. Additionally, PCR-based tests like the liquid biopsy help in monitoring cancer progression and treatment response.

3. Pharmacogenetics and Personalized Medicine: PCR assists in identifying genetic variations that influence an individual's response to drugs. This information can guide healthcare providers in tailoring medication regimens for optimal efficacy and reduced adverse effects.

4. Virology and Vaccine Development: PCR is used to quantify viral load in infected individuals, which is vital for understanding disease progression and evaluating antiviral therapies. It is also integral to vaccine development by assessing vaccine efficacy and monitoring immune responses.

5. Genetic Diversity and Evolutionary Studies: PCR amplification of specific gene regions allows researchers to study genetic diversity within populations and trace evolutionary relationships between species. This information is valuable for conservation efforts and understanding evolutionary history.

6. DNA Profiling and Forensics: PCR-based methods like short tandem repeat (STR) analysis are used for DNA profiling in forensics. This helps in identifying individuals, solving criminal cases, and establishing paternity.

7. Environmental Monitoring: PCR is utilized to detect and quantify microorganisms in environmental samples, aiding in monitoring microbial communities in soil, water, and air. This information is valuable for assessing ecosystem health and potential pollution.

8. Ancient DNA Analysis: PCR enables the amplification of ancient DNA from archaeological remains. This helps in reconstructing historical genomes, studying past populations, and understanding the genetic basis of ancient diseases.

9. Non-Invasive Prenatal Testing (NIPT): PCR-based NIPT involves analyzing fetal DNA present in maternal blood to screen for chromosomal abnormalities like Down syndrome. It provides a safer alternative to traditional invasive procedures.

10. Food Safety and Quality Assurance: PCR is used to detect foodborne pathogens like Salmonella and E. coli in food products. It ensures the safety of the food supply chain and helps in preventing foodborne illnesses.

11. Mutation Detection in Inherited Diseases: PCR-based techniques are crucial for diagnosing genetic disorders caused by specific mutations. For example, PCR can detect the presence of mutations associated with cystic fibrosis, sickle cell anemia, and more.

12. Detecting Rare and Low-Abundance Targets: PCR's sensitivity allows for the detection of rare DNA sequences, such as circulating tumor DNA in cancer patients, even when present in extremely low amounts.

13. Quality Control in Biotechnology: PCR is used to confirm the presence or absence of specific genetic elements in genetically modified organisms (GMOs) and recombinant DNA products.

14. Clinical Trials and Drug Development: PCR is employed in clinical trials to monitor patient response to treatment, assess disease progression, and evaluate the impact of new therapies.

15. **Practical purpose**:

Undergraduate Level:

Third Year: Students who are pursuing bachelors in biotechnology,often encounter PCR at this stage. They should have a solid understanding of DNA structure, DNA replication, and basic molecular biology concepts. PCR might be covered in advanced courses or laboratory sessions.

Post Graduate Level:

Master's and Ph.D. Programs: Students pursuing advanced degrees in biotechnology or related disciplines will delve deeper into PCR and its applications. They may use PCR extensively in their research projects and develop a thorough understanding of its nuances.

Cost- Rs. 3,10,000/-

3 FLAME PHOTOMETER

This instrument was developed to measure the low concentrations of sodium and potassium in a solution. The principle of flame photometer is based on the measurement of the emitted light intensity when a metal is introduced into the flame. The wavelength of the colour gives information about the element and the colour of the flame gives information about the amount of the element present in the sample. Flame photometry is one of the branches of atomic absorption spectroscopy. It is also known as flame emission spectroscopy. Currently, it has become a necessary tool in the field of **analytical chemistry**.

Flame photometer can be used to determine the concentration of certain metal ions like sodium, potassium, lithium, calcium and cesium etc. In flame photometer spectra the metal ions are used in the form of atoms.

The compounds of the alkali and alkaline earth metals (Group II) dissociate into atoms when introduced into the flame. Some of these atoms further get excited to even higher levels. But these atoms are not stable at higher levels. Hence, these atoms emit radiation when returning back to the ground state. These radiations generally lie in the visible region of the spectrum. Each of the alkali and alkaline earth metals has a specific wavelength. For certain concentration ranges, the intensity of the emission is directly proportional to the number of atoms returning to the ground state. And the light emitted is in turn proportional to the concentration of the sample.

Element	Emitted wavelength	Flame colour
Sodium	589 nm	Yellow
Potassium	766 nm	Violet
Barium	554 nm	Lime green
Calcium	622 nm	Orange
Lithium	670 nm	Red

Parts of flame photometer

A simple flame photometer consists of the following basic components:

- **Source of flame:** A Burner in the flame photometer is the source of flame. It can be maintained at a constant temperature. The temperature of the flame is one of the critical factors in flame photometry.
- **Nebuliser:** Nebuliser is used to send homogeneous solution into the flame at a balanced rate.
- **Optical system:** The optical system consists of a convex mirror and convex lens. The convex mirror transmits the light emitted from the atoms. Convex mirror also helps to focus the emissions to the lens. The lens helps to focus the light on a point or slit.
- **Simple colour filters:** The reflections from the mirror pass through the slit and reach the filters. Filters will isolate the wavelength to be measured from that of irrelevant emissions.
- **Photo-detector:** The intensity of radiation emitted by the flame is measured by a photo detector. Here the emitted radiation is converted to an electrical signal with the help of a photo detector. These electrical signals are directly proportional to the intensity of light.

Working procedure

- Both the standard stock solution and sample solution are prepared in fresh distilled water.
- The flame of the photometer is calibrated by adjusting the air and gas. Then the flame is allowed to stabilise for about 5 min.
- Now the instrument is switched on and the lids of the filter chamber are opened to insert appropriate colour filters.
- The readings of the galvanometer are adjusted to zero by spraying distilled water into the flame.
- The sensitivity is adjusted by spraying the most concentrated standard working solution into the flame. Now the full scale deflection of the galvanometer is recorded.
- Again distilled water is sprayed into the flame to attain constant readings of the galvanometer. Then the galvanometer is readjusted to zero.
- Now each of the standard working solutions is sprayed into the flame for three times and the readings of the galvanometer are recorded. After each spray, the apparatus must be thoroughly washed.

- Finally a sample solution is sprayed into the flame for three times and the readings of the galvanometer are recorded. After each spray, the apparatus must be thoroughly washed.
- Calculate the mean of the galvanometer reading.
- Plot the graph of concentration against the galvanometer reading to find out the concentration of the element in the sample.

Applications of flame photometer for biotechnology students

- Flame photometer can be applied both for quantitative and qualitative analysis of elements. The radiations emitted by the flame photometer are characteristic to particular metal. Hence with the help of a Flame photometer we can detect the presence of any specific element in the given sample.
- The presence of some group II elements is critical for soil health. We can determine the presence of various alkali and alkaline earth metals in soil samples by conducting flame tests and then the soil can be supplied with specific fertiliser.
- Detailed Soil analysis can be carried out using flame photometers by students of post graduation.
- The concentrations of Na+ and K+ ions are very important in the human body for conducting various metabolic functions. Their concentrations can be determined by diluting and aspirating blood serum samples into the flame.
- Soft drinks, fruit juices and alcoholic beverages can also be analysed by using flame photometry to determine the concentrations of various metals and elements.

Advantages of flame photometer

- The method of analysis is very simple and economical.
- It is quick, convenient, selective and sensitive analysis.
- It is both qualitative and quantitative in nature.
- Even very low concentrations (parts per million/ppm to parts per billion/ppb range) of metals in the sample can be determined.
- This method compensates for any unexpected interfering material present in the sample solution.
- This method can be used to estimate elements which are rarely analysed.

BRAND: IGene Labserve Private Limited

TENTATIVE COST: ₹ 3.2 Lakh

4 COOLING CENTRIFUGES PLUS

A centrifuge is a powerful device utilised for separating and purifying mixtures by employing centrifugal force. It effectively separates particles based on their size, shape,

density, viscosity, and rotor speed. The process involves the sinking of particles with higher density to the bottom while the lighter ones float to the top. This innovative instrument enables efficient separation and purification of substances by utilising the force generated through rapid spinning. By leveraging centrifugal force, a centrifuge facilitates precise particle separation and purification, making it an indispensable tool in various fields.

- The principle behind centrifuges is the sedimentation principle, which is employed by all types of centrifuges. In this principle, the acceleration of the rotor initiates a centripetal force that acts upon both the rotor and the centrifuge tubes. To achieve this, a device is designed to rotate the solution around a fixed axis, with the force applied perpendicular to the axis of the spin. As a result of this action, denser particles move outward in a circular direction, while lighter particles move toward the centre.
- The rate of sedimentation is influenced by several factors, including the applied centrifugal field (G).
- Additionally, other factors such as the mass, density, and volume of the particles, as well as their shape and friction, contribute to the sedimentation process.

User instructions (including sampling instructions):

- It is important that all staff working in the Research Facility use the same procedure when operating the centrifuge as specified in the trial protocol, to ensure consistency and continuity in the sample processing.
- Identify the speed and duration for samples PRIOR to using this instrument.
- Check the rotor intended to use and be certain that the rotor is rated for the speed at which we would like to use it. If the rotor is not capable of being operated at the target speed, we will need to identify the rotor that is capable of being used at the desired speed, and then transfer samples to a centrifuge tube that will fit and rebalance the samples, remembering to include the lids when balancing.
- Place the rotor in the centrifuge with the 2 pins on the underside of the rotor forming a cross with the 2 pins found on the spindle of the centrifuge.
- Check the name of the rotor and confirm the target speed.
- Locate the correct lid for the selected rotor and place it beside the centrifuge.
- Balance the opposing holders by weighing them with their tubes on an open two-pan balance. Add water to an empty tube placed in the buckets to achieve final balance.

- Never fill centrifuge tubes to more than three-quarters capacity. Symmetrically distributed balanced tubes in opposing buckets.
- Always operate the centrifuge with all buckets in place, even if two opposing buckets are empty.
- If excessive vibration occurs, or if a crack is heard or tube breakage is suspected, switch off the unit.
- Remove the sealed buckets (not tubes) slowly and carefully to prevent re-suspension of the sediments.

APPLICATIONS OF COOLING CENTRIFUGE FOR UNDER-GRADUATES, POST-GRADUATES AND RESEARCH BIOTECHNOLOGY STUDENTS:

1. **Separation of Mixtures:** Centrifuges are widely used for the separation of mixtures containing molecules with similar densities or immiscible liquids. By subjecting the mixture to centrifugal force, the components can be effectively separated based on their varying densities and physical properties.
2. **Blood Component Separation:** One of the essential applications of centrifuges is in the medical field for separating blood components. Centrifugation enables the separation of blood cells from plasma or serum, which is crucial for various diagnostic and analytical procedures.
3. **Analysis of Blood Samples:** Centrifugation plays a vital role in laboratory analysis. By separating blood components, it facilitates the analysis of various parameters such as cell counts, hematocrit levels, and identification of disease markers.
4. **Immunochemical Assays:** They are utilised in immunochemical assays to separate protein-bound ligands from free ligands. This separation enables accurate measurement and detection of specific molecules, aiding in research, diagnostics, and drug development.
5. **Isotope Separation:** Centrifuges have significant applications in isotope separation, particularly in nuclear industries and scientific research. By utilising the varying masses of isotopes, centrifugation can effectively separate isotopes for further analysis or industrial purposes.
6. **Subcellular Organelle Isolation:** Centrifugation is crucial in cell biology and molecular biology for isolating subcellular organelles. By subjecting cell suspensions to centrifugal force, different organelles such as mitochondria, nuclei, and lysosomes can be separated, enabling detailed study and analysis of their functions.

7. **Nucleic Acid Extraction:** Centrifuges are instrumental in extracting nucleic acids, including RNA and DNA, from biological samples. By separating cellular components, centrifugation aids in the isolation of nucleic acids for applications in genetic research, forensics, and diagnostic testing.
8. Refrigerated centrifuges are used for those samples that need to be stored at consistent temperature to make the sample perfect for analysing.
9. The temperature ranges from -20 to -40 degree Celsius and can go up to a maximum of 6500 g centrifugal force.
10. It is used for analysing DNA, RNA, PCR, antibodies, yeast cells, chloroplast etc. for post graduation students.

BRAND NAME: REMI Elektrotechnik Limited

TENTATIVE COST: 4 Lakhs

5 ELISA READER WITH KIT AND ACCESSORIES

Usefulness of Elisa reader for biotechnology students

1. Practical Experience: The ELISA reader is a specialized spectrophotometer—an apparatus for measuring the intensity of light throughout a part of the spectrum—that lets us measure the reactions of antigens and antibodies in a solution through enzyme activity. It is used for immunological practical purposes by second year and third year biotechnology students.

2. Students can use Elisa readers for antibody testing. These machines have proven to be versatile and have been modified for different applications in the biotechnological fields giving more exposure to the graduate and post graduate biotechnology students.

3. ELISA readers play a crucial role in protein and enzyme testing. Students in first year and second year use them to study the presence, concentration, and activity of proteins and enzymes. By quantifying the signals generated by specific protein-

antibody or enzyme-substrate interactions, ELISA readers provide valuable data that aids in understanding biological processes and investigating disease mechanisms.

4. Students wishing to perform post graduation projects can use ELISA readers is in the detection of HIV. ELISA-based tests are commonly used to identify antibodies against the virus in patient samples, enabling the diagnosis of HIV infection. ELISA readers accurately measure the signals produced by the interaction between HIV antigens and patient antibodies, contributing to the reliable detection and diagnosis of the virus.

5. Additionally, ELISA readers are employed in nucleic acid quantification. Through specific assays, first second and third year students can measure the concentration of nucleic acids, such as DNA or RNA, in a sample. This information is essential in various research areas, including gene expression studies, genetic analysis, and diagnostic testing for infectious diseases. ELISA readers assist in quantifying the signals generated by nucleic acid-specific probes, providing valuable data for nucleic acid analysis.

6. The versatility and accuracy of ELISA readers have made them indispensable tools in the field of life sciences. They continue to be adapted for different applications and are widely used in research laboratories, diagnostic facilities, and pharmaceutical companies. Third year Students can use Elisa reader to measure and quantify signals in antibody testing, protein and enzyme assays, HIV detection, and nucleic acid quantification very precisely, ELISA readers greatly enhance our understanding of biological processes and contribute to advancements in various fields of science and medicine.

7. Research projects: Students pursuing graduation and post graduation can do research projects employing Elisa readers, such as examining the antibody testing, protein and enzyme assays, HIV detection, and nucleic acid quantification of different patients samples.

8. Quantifying the signal in each sample is performed by comparing the value to the standard curve to determine the concentration. Second and third year Students can determine relative quantification by comparing samples to each other or to a reference sample.

9. Elisa reader can be used by second year and third year along with students pursuing post graduation used to measure chemical, biological or physical reactions, properties, and analytes. This is very helpful for biotechnology students.

10. to perform a quantitative ELISA assay for hepatitis B, chikungunya, and other infectious diseases like **Infectious Diseases:** HIV, HBsAg, HCV, Syphilis, Malaria, Leptospira, Chikungunya, **Hepatits A:** Anti-total HAV, Anti-HAV IgM,, **Hepatitis B:** Anti-HBs, Anti-HBc, Anti-HBc IgM for study in SY and MSc students

Cost- Rs. 4,50,000/-

6 ANAEROBIC ROTARY SHAKER WITH TEMPERATURE CONTROL

Intended use for biotechnology practical's at B.Sc., MSc,. For PhD research level for its use in cultivation of anaerobic organisms used in fermentations and for providing the optimum anaerobic shaker conditions for the microbes isolated from environmental samples in environmental analysis

SPECIFICATIONS: Model-MODEL: LE4676

Anaerobic Rotary Flask shakers are ideal for mixing and development of cultures, chemicals, solvents, and assays etc. in Microbiological, Cell Culture & Life Science laboratories.

It is continuous-duty device designed for the agitation of solid phase peptide synthesis flasks and other similar glassware.

Used for sample mixing applications for biochemistry and clinical testing.

- **In Microbiology:**

  It provides the optimum conditions for the growth of bacteria, so can used to study the growth rate of the same.

  Use for Undergraduate, Post graduate practical to study the growth curve of the bacteria, M.Sc. project and Ph.D. research.

- **In fermentation technology for Ethanol and lactic acid production.**

  It provides optimum conditions for fermentation in a liquid culture that undergoes continuous shaking at a desired constant temperature. The continuous shaking movement enables the microbe to grow uniformly and attain the nutrients under anaerobic conditions.

  Can be mainly used for the production of Ethanol and bio fuel, lactic acids. Intended for performing the Practical at F.Y., S.Y and T.Y Levels.

- **For antibiotics production**

  Can be used for the production of the fungal antibiotics as a part of S.Y. practical's.

- **In enzymology**

  Can be used in the synthesis of the commercially important microbial enzymes under anaerobic conditions. Intended use for M.Sc students as a part of their practicals.

- **For Culturing of anaerobic bacteria from environmental samples for pollutant degradation**

Provides the optimum temperature and anaerobic conditions for the growth of the microbes isolated from the environmental samples like soil, etc.

Also provides the optimum conditions for the anaerobic degradation of the pollutants present in the effluents.

Use for Undergraduate, post graduate practical and research projects and Ph.D research.

BENEFITS OF ANAEROBIC ROTARY SHAKER

The speed and angle of the rotation axis is adjustable which provides for precise control over the level of agitation. Anaerobic rotary shakers are ideal for general mixing of nutrients and for use in temperature and gas controlled environments.

Requires no trained labor and is cost effective.

COMPANY MANUFACTURER: Scigenics Biotech Private ltd.

COST: ₹ 17.5/-lakhs

BROCHURE LINK:

https://scigenicsbiotech.com/wp-content/uploads/2023/06/Lab-plus-incubator-Shaker.pdf-

7 DOUBLE BEAMED SPECTROPHOTOMETER

Usefulness of Double beamed spectrophotometer

1. DNA analysis: Double beamed spectrophotometer can be used by second and third year students for analyzing the nucleic acids such as DNA

2. Protein analysis: double beamed spectrophotometer can be used by students in their projects for quantifying the amount of protein in solution directly by UV-absorbance with a spectrometer. Samples are exposed to UV light with wavelengths from 260 – 280m and the extent of absorption is measured.

3. Quantitative analysis: students can measure the amount of nucleic acid, and purified proteins with precise measurement in the same UV region in some of the first to third year biotechnological experiments.

4. Practical purpose: Third year students can use double beamed spectrophotometer to determine how much light is absorbed by a colored chemical dissolved in the solution in different experiments

5. This instrument is used in molecular biology. Second year Students can measure the growth of microorganisms like bacteria by double beamed spectrophotometer.

6. Students doing research projects can used double beamed spectrophotometer in drug analysis to find the composition of drugs.

7. Double beamed spectrophotometer can be used in water quality checking experiments by students for their research projects in third year.

8. Double beamed spectrophotometer can be used in blood related experiments for analyzing blood and its components.

9. Students can this use this instrument in first and second year the detection of impurities in organic compounds.

10. Double beamed spectrophotometer can be used in quantifying the different colour measurements of solutions and materials from different components such as textiles, food components etc by the students who are wishing to perform research projects

Cost- Rs. 5,10,000/-

8 Vertical Laminar Airflow Unit

For maintaining aspetic conditions for all Research and Microbiological experiments conducted as per the curriculum

Rs. 700000/-

Scineers Scientific India Pvt. Ltd.

9 Biosafety Cabinet

Biosafety Cabinets are commonly used in research applications involving biotechnology microbiology, molecular biology, and cell culture work.

They are particularly useful for experiments involving the manipulation of DNA, RNA, and proteins. BSCs are also frequently used in medical research, such as for the development of vaccines and other treatments. Additionally, BSCs are a must in diagnostic microbiology, providing a sterile environment for the isolation and identification of pathogens.

COMPANY MANUFACTURER: Top Air Systems

TENTATIVE COST: ₹ 3,85,000/- lakhs

SPECIFICATIONS:

- The IPMS measures particle concentration in real time, monitoring the cleanliness level 24/7.
- Its display clearly indicates whether or not the cleanliness level complies with ISO-5, and alerts when the workspace has been contaminated and needs to be serviced.
- The IPMS smart algorithm processes data provided by an advanced built-in sensor, and displays a reliable outcome

USE OF BIOSAFETY CABINET IN BIOTECHNOLOGY

- The primary function of biosafety cabinets is to protect the laboratory worker and the surrounding environment from pathogens.
- It shields a person from biohazards and contamination while also preserving the quality of the material being worked on.

- **Personnel Protection**: They protect laboratory workers from exposure to harmful pathogens or substances by creating a physical barrier.
- **Sample Protection**: Biosafety cabinets prevent contamination of samples by providing a sterile environment, minimizing the risk of cross-contamination.
- **Environmental Protection:** They ensure that hazardous materials are contained and do not escape into the surrounding environment.
- **Product Integrity:** Biosafety cabinets maintain the integrity of sensitive materials, such as cell cultures, by providing a controlled environment.
- **Airborne Pathogen Control:** Cabinets with HEPA filters help filter and trap airborne contaminants, reducing the spread of pathogens.
- **Regulatory Compliance:** They help laboratories comply with biosafety guidelines and regulations.
- **Work Area Organization:** Biosafety cabinets offer organized and designated workspaces for various tasks, enhancing efficiency.
- **Reduced Aerosol Generation:** Cabinets help contain aerosols generated during procedures, minimizing the risk of pathogen release.
- **Noise Reduction:** Some cabinets offer noise reduction features, creating a more comfortable working environment.
- **Research Continuity:** By safeguarding researchers and samples, biosafety cabinets contribute to uninterrupted research operations.
- **Personal Comfort:** Biosafety cabinets offer ergonomic design features, such as adjustable work surfaces and footrests, to enhance the comfort of laboratory personnel during extended work periods.
- **Prevent Cross-Contamination**: Biosafety cabinets help prevent cross-contamination between different samples, as each sample is processed within its designated workspace.
- **Real-time Monitoring:** Some advanced biosafety cabinets come with monitoring systems that provide real-time feedback on airflow, filter integrity, and other critical parameters, ensuring optimal operation.
- **Flexibility:** Biosafety cabinets can accommodate various equipment and tools needed for different experiments, promoting flexibility in experimental setups.
- **Training Platform:** Biosafety cabinets can serve as a controlled training environment for new laboratory staff, allowing them to learn and practice safe techniques.

- **Emergency Preparedness:** In case of spills or accidents, biosafety cabinets offer a controlled environment that can help contain and manage hazardous materials until proper cleanup procedures can be executed.
- **Long-Term Cost Savings:** By preventing contamination and preserving sample integrity, biosafety cabinets can lead to cost savings by reducing the need for repeated experiments or the loss of valuable samples.
- **Biosecurity:** Biosafety cabinets play a role in biosecurity efforts by limiting the potential release of dangerous pathogens or biohazardous materials.
- **Modular Design:** Some biosafety cabinets are designed to be modular, allowing for easy customization and adaptation to changing laboratory needs.
- **Reduced Energy Consumption:** Advanced biosafety cabinets are designed to be energy-efficient, contributing to a laboratory's overall sustainability efforts.
- **Collaboration and Communication:** Biosafety cabinets with built-in communication features, such as intercoms or visual displays, facilitate communication among laboratory personnel during experiments.
- **Compatibility with Sensitive Instruments:** Biosafety cabinets can house sensitive instruments, such as microscopes or flow cytometers, while maintaining the required level of protection.

These benefits highlight the crucial role that biosafety cabinets play in maintaining safe and efficient laboratory operations.

https://pdf.indiamart.com/impdf/23417412273/31301476/top-air-biological-safety-cabinets.pdf

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PRADHAN MANTRI UCHCHATAR SHIKSHA ABHIYAN (PM-USHA)

EXHIBIT - 5

Details of Equipment to be procure

Department of

CHEMISTRY

Prepared by : Internal Quality Assurance Cell

LIST OF EQUIPMENT TO BE PROCURE

Sr. No.	Name of Instrument	Cost
1	**GC** (Gas Chromatography)	**35,40,000** Make : Agilent
2	**Rotavapour**	**8,26,000** Make : Buchi
3	**FTIR** (FT- Infra Red Spectrophotometer)	**15,00,000/-** Make : Thermofischer
4	Nanodrop Spectrophotometer	**6,91,480** Make : Thermo Fischer
5	Fumehood	**2,50,000**
6	Oil Free Vaccum Pump	**2,50,000** Make : Vario Select
7	Microwave Distillation Assembly	**2,50,000**

1 GAS CHROMATOGRAPHY (GC)

Gas Chromatography (GC) in Various Fields of Chemistry:

1. Environmental Analysis:

- Detection and quantification of volatile organic compounds (VOCs) in air, water, and soil samples.
- Monitoring of pollutants and contaminants in environmental samples.
- Analysis of atmospheric gases and pollutants to assess air quality.

2. Food and Beverage Industry:

- Detection of flavor compounds, additives, and contaminants in food and beverage products.
- Identification of aroma compounds in beverages and food products.
- Quality control and authentication of food products.

3. Pharmaceutical Industry:

- Analysis of drug compounds, their impurities, and degradation products.
- Quantitative determination of active pharmaceutical ingredients (APIs) in drug formulations.
- Characterization of drug metabolites in biological samples.

4. Forensic Science:

- Identification of illicit drugs, explosives, and trace substances in forensic samples.
- Analysis of arson residues and accelerants in fire investigations.
- Detection of volatile compounds related to crime scenes.

5. Petrochemical Industry:

- Analysis of hydrocarbons, such as crude oil and refined products, for quality and composition.
- Determination of components in natural gas and liquefied petroleum gas (LPG).
- Monitoring of volatile compounds in petrochemical processes.

6. Clinical and Medical Research:

- Analysis of volatile metabolites in breath samples for disease diagnosis (e.g., breathalyzer tests).
- Identification of volatile markers in body fluids for disease biomarker discovery.
- Drug testing and monitoring in clinical samples.

Gas Chromatography in Our Research Center:

1. **Analysis of Volatile Organic Compounds (VOCs):**

- GC can be used to identify and quantify VOCs generated in various organic reactions.
- Identification of VOCs as impurities.

2. **Separation of Organic Compounds:**

- GC allows for the separation of complex mixtures of organic compounds based on their volatility and affinity for the stationary phase.
- This separation aids in the characterization and quantification of individual compounds within a mixture.

3 Training and Method Development:

- GC systems can be utilized to train researchers in chromatographic techniques and analysis of chromatograms.
- Method development involves optimizing GC parameters to achieve better separation and sensitivity for specific compound classes.

2 ROTARY EVAPORATOR

General Uses of Rotary Evaporator:

1. **Solvent Removal:** The primary purpose of a rotavap is to remove solvents from liquid samples, concentrating the desired compounds for further analysis or processing.
2. **Concentration:** Solutions containing low concentrations of a target compound can be concentrated using a rotavap, making it easier to detect or study the compound.
3. **Sample Preparation:** In chemical analysis, samples often need to be concentrated before analysis. Rotavaps aid in preparing concentrated samples for techniques like chromatography, spectroscopy, and more.
4. **Extraction:** It is used to recover solvents or valuable compounds from extracts obtained through various extraction methods like solid-liquid extraction, Soxhlet extraction, etc.
5. **Distillation:** A rotavap can perform simple distillations, helping separate components of a mixture based on their boiling points.
6. **Medicinal Chemistry:** In drug discovery, rotavaps are used to concentrate and purify synthesized compounds for biological testing.

Uses of Rotavap in Our Research Center

1. **Solvent Removal from Extracts:** After extracting plant materials with solvents, a rotavap is used to efficiently remove the solvent, leaving behind concentrated plant extracts for analysis.
2. **Isolation of Active Compounds:** In the study of medicinal plants, rotavaps are used to isolate active compounds that can have pharmaceutical or therapeutic applications.

3 FTIR (FOURIER-TRANSFORM INFRARED SPECTROSCOPY)

FTIR (Fourier-Transform Infrared Spectroscopy) in Various Chemistry-Related Fields:

1. **Identification of Functional Groups:**
   FTIR is widely used to identify functional groups within a molecule. Different functional groups absorb specific frequencies of infrared light, allowing chemists to determine the presence of specific bonds or groups.

2. **Quantitative Analysis:**
   FTIR can be used for quantitative analysis, determining the concentration of a particular compound in a mixture based on its absorption intensity at specific wavelengths.

3. **Polymer Characterization:**
   FTIR is crucial for polymer chemistry. It helps in analyzing the structure of polymers, determining the presence of additives, and monitoring the degree of polymerization.

4. **Pharmaceutical Analysis:**
   FTIR is used to analyze pharmaceutical compounds, including their purity, stability, and formulation. It's valuable in identifying active pharmaceutical ingredients (APIs) and detecting impurities.

5. **Environmental Chemistry:**
   FTIR can identify pollutants in environmental samples, helping in monitoring air and water quality by detecting compounds like greenhouse gases and pollutants.

6. **Forensic Analysis:**
   FTIR assists in the identification of trace evidence in forensic investigations, such as analyzing paint chips, fibers, and unknown substances found at crime scenes.

7. **Food and Beverage Industry:**
   FTIR is used to assess the quality and composition of food products, detecting contaminants, and ensuring product authenticity.
8. **Catalyst Characterization:**

FTIR is employed to study the surface chemistry of catalysts, providing insights into the reaction mechanisms and active sites.

9. **Biochemical Analysis:**
   FTIR can be used for studying biomolecules like proteins, nucleic acids, and lipids. It helps in understanding their structure and conformational changes.

FTIR at Our Research Center:

1. **Spectral Analysis of Reactants & Products:** FTIR can be utilized to study the chemical reactions taking place in your research center. By analyzing the infrared spectra of reactants and products, you can monitor changes in functional groups, reaction progress, and identify intermediate compounds.

2. **Training of Undergraduate Students:** FTIR can be integrated into undergraduate chemistry curricula. It offers hands-on experience with modern analytical techniques, enhancing students' understanding of molecular spectroscopy and chemical analysis.

3. **Quality Control and Characterization:** FTIR can be employed to ensure the quality and consistency of synthesized compounds. It aids in verifying the identity of products and assessing their purity.

4. **Reaction Mechanism Studies:** FTIR can help elucidate reaction mechanisms by tracking changes in functional groups during reactions. This information is valuable for proposing and validating reaction pathways.

4 NANODROP SPECTROPHOTOMETER

Nanodrop Spectrophotometer in Chemistry:

1. **Nucleic Acid Quantification:**

   In molecular biology, Nanodrop is extensively used to quantify DNA, RNA, and oligonucleotide concentrations. It assesses the purity of these nucleic acids by measuring the ratio of absorbance at specific wavelengths, such as the A260/A280 ratio for DNA and RNA.

2. **Protein Analysis:**

   The spectrophotometer is used for protein concentration determination, mainly through the Bradford, Lowry, or BCA assays. These assays rely on colorimetric reactions, where the intensity of color is directly proportional to the protein concentration.

3. **UV-Vis Absorption Spectra:**

   Nanodrop can provide UV-Vis absorption spectra of samples, giving insights into the chemical structure of compounds and the presence of functional groups.

4. **Enzyme Kinetics:**

   Researchers can employ the Nanodrop for studying enzyme kinetics by monitoring changes in absorbance at specific wavelengths as enzymatic reactions progress.

5. **Drug and Compound Analysis:**

   It's used to determine the concentration of drug compounds in solution, making it valuable in pharmaceutical research.

6. **Quality Control in Biotechnology:**

   Nanodrop is used to monitor the quality and purity of synthesized oligonucleotides and proteins in biotechnology processes.

Nanodrop Spectrophotometer in Our Research Center

1. **DLLME Method (Dispersion Liquid-Liquid Microextraction):**

- Nanodrop Spectrophotometer can be utilized to quantify analytes extracted using the DLLME method. DLLME is a sample preparation technique that improves detection sensitivity by concentrating analytes.
- The instrument can measure the concentration of extracted compounds in the dispersed phase after the extraction process.

2. **Metal Estimation:**

- Nanodrop can aid in the estimation of metal ions in solutions, which is crucial in various fields, including environmental monitoring and analytical chemistry.
- It can measure the absorbance of metal complexes or colorimetric reactions formed between metal ions and specific reagents, enabling the determination of metal ion concentrations.

3. **Quantification of Extracted Compounds:**

- In your research involving DLLME, you can quantify the concentration of extracted compounds in the organic phase using the Nanodrop, helping you assess the efficiency of the extraction process.

5 FUMEHOOD

Fume Hood in Chemistry - General Uses:

1. **Chemical Synthesis**: Fume hoods are widely used in chemistry laboratories for the synthesis of various chemical compounds. They provide a controlled environment to handle reactive or hazardous chemicals safely.
2. **Safety**: Fume hoods protect researchers from exposure to toxic, corrosive, or noxious fumes and vapors that may be produced during experiments.
3. **Ventilation**: They ensure proper ventilation by removing harmful gases and fumes through an exhaust system, preventing the buildup of potentially dangerous concentrations in the lab.
4. **Solvent Handling**: Fume hoods are crucial when working with volatile solvents or flammable chemicals, as they reduce the risk of fire or explosion.
5. **Hazardous Reactions**: Researchers can conduct experiments involving hazardous reactions, such as oxidations or reactions with strong acids/bases, within the fume hood to contain any potential accidents.
6. **Sample Preparation**: Fume hoods are used for preparing samples for analysis, including weighing, dilution, and mixing of chemicals.
7. **Chemical Analysis**: In analytical chemistry, fume hoods are employed during procedures like sample digestion or the use of volatile reagents.

Fume Hood in Our Research Center:

1. **Hazardous Reaction Containment**: Fume hoods are essential in your research center to safely contain and vent fumes from hazardous reactions. This includes experiments involving strong acids, bases, reactive chemicals, or compounds with noxious fumes.
2. **Protection from Exposure**: They safeguard researchers from exposure to toxic substances, reducing the risk of health issues associated with chemical exposure.
3. **Chemical Waste Handling**: Fume hoods are ideal for safely disposing of chemical waste, especially when it involves hazardous materials that need to be neutralized or stored for disposal.
4. **Regulatory Compliance**: They are crucial for meeting safety and environmental regulations, ensuring that your research center operates in compliance with industry standards.

6 OIL-FREE VACUUM PUMP

1. **Analytical Chemistry:** Oil-free vacuum pumps are used in analytical instruments like mass spectrometers and gas chromatographs to maintain a vacuum for sample

analysis. They ensure that there is no contamination of samples or instruments due to oil vapors.

2. **Chemical Synthesis:** These pumps are employed in chemical laboratories to provide vacuum conditions for various synthetic reactions. They aid in removing solvents and by-products, facilitating reactions at reduced pressure.

3. **Rotary Evaporation (Rotavap):** Oil-free vacuum pumps are crucial for rotary evaporation processes. They enable the evaporation of solvents at lower temperatures, reducing the risk of heat-sensitive compound degradation and promoting efficient solvent recovery.

4. **Vacuum Drying:** In chemistry, vacuum drying is often used to remove moisture or other volatile substances from samples. Oil-free vacuum pumps create the necessary low-pressure environment for this purpose.

5. **Vacuum Distillation:** For the separation of components with different boiling points, vacuum distillation is employed. Oil-free vacuum pumps enable precise control over the distillation process by maintaining consistent vacuum levels.

Oil-Free Vacuum Pump in Your Research Center:

1. **Reactions under Vacuum:** Oil-free vacuum pumps play a crucial role in your research center by providing the necessary vacuum conditions for a wide range of reactions. This is particularly valuable for reactions that involve air-sensitive compounds or require reduced pressure for specific chemical transformations.

2. **Rotary Evaporation (Rotavap):** In your research center, these pumps are indispensable for rotary evaporation processes. They ensure efficient solvent removal at reduced pressures, enabling the concentration and purification of reaction products without the risk of contaminating the samples with oil residues.

3. **Sample Drying:** Oil-free vacuum pumps are utilized for sample drying, especially when dealing with moisture-sensitive compounds. They allow researchers to thoroughly dry samples without introducing impurities, ensuring the accuracy of analytical results.

4. **Distillation:** For vacuum distillation processes, such as fractional distillation or short-path distillation, oil-free vacuum pumps enable precise control over temperature and pressure conditions, which is essential for separating components with different volatilities.

7 MICROWAVE DISTILLATION ASSEMBLY

Microwave Distillation Assembly in Chemistry (General):

Applications:

1. **Analysis of Essential Oils**: In the fragrance and essential oil industry, microwave distillation is employed to isolate and analyze aroma compounds.

2. **Environmental Testing**: It's used to analyze environmental samples like water and soil for the presence of volatile pollutants.

3. **Petroleum Industry**: Microwave distillation helps in the analysis of crude oil and petroleum products.

4. **Pharmaceutical Research**: Used in drug development to separate and analyze volatile compounds.

5. **Efficiency and Green Chemistry**: Microwave-assisted reactions and distillation are often considered green chemistry techniques as they can reduce reaction times and energy consumption, potentially making processes more environmentally friendly.

Microwave Distillation Assembly at Our Research Center:

1. **Microwave Assisted Reactions**: The assembly is likely used to perform microwave-assisted reactions. Microwave heating can accelerate chemical reactions by providing rapid and efficient energy transfer to the reactants. This can include organic synthesis, hydrothermal reactions, and more.

2. **Product Isolation**: In your research center, the microwave distillation assembly could be utilized for isolating and purifying reaction products. It's particularly valuable when working with temperature-sensitive compounds.

3. **Purification of Organic Compounds**: It's used to purify and separate volatile organic compounds from complex mixtures, such as natural product extracts.

8 LC-MS (Liquid Chromatography-Mass Spectrophotometer)

Liquid Chromatography-Mass Spectrometry (LC-MS) Applications:

1. **Pharmaceutical Analysis:**

- Quantitative determination of drug compounds in biological samples.
- Identification and characterization of impurities in pharmaceutical products.
- Drug metabolism studies to understand how drugs are metabolized in the body.

2. **Environmental Analysis:**

- Detection and quantification of environmental pollutants such as pesticides, herbicides, and endocrine disruptors.
- Monitoring of water and soil contaminants.

3. **Food and Beverage Analysis:**

- Detection of food adulterants, contaminants, and residues.
- Determination of pesticide levels in fruits and vegetables.
- Analysis of food additives and flavor compounds.

4. **Forensic Analysis:**

- Identification of drugs, explosives, and other compounds in forensic samples.
- Analysis of trace evidence from crime scenes.

5. **Proteomics and Metabolomics:**

- Identification and quantification of proteins and metabolites in biological samples.
- Study of cellular processes, biomarkers, and disease pathways.

6. **Natural Product Analysis:**

- Characterization of natural products from plants, fungi, and other sources.
- Identification of bioactive compounds and their activities.

7. **Phytochemical Studies:**

- Examination of plant extracts for bioactive compounds, antioxidants, and secondary metabolites.

- Determination of medicinal properties and potential applications of plant-derived compounds.

8. **Drug Development:**

- Screening of compound libraries for potential drug candidates.
- Structural elucidation of new drug molecules.

9. **Clinical Research:**

- Biomarker discovery for disease diagnosis and prognosis.
- Analysis of metabolites and small molecules in clinical samples.

LC-MS Applications in Our Research Center:

Phytochemical Study of Plants:

- Identification of bioactive compounds present in plant extracts.
- Quantification of specific phytochemicals for nutritional or medicinal purposes.
- Investigation of the chemical composition of different plant parts.

Impurities and Identification of Product Formed:

- Detection and quantification of impurities in synthesized products.
- Structural elucidation of impurities to ensure product quality and safety.
- Monitoring of reaction progress and formation of desired products.
- Rapid analysis of reaction by-products and intermediates.

Sonopant Dandekar Shikshan Mandali's

SONOPANT DANDEKAR ARTS, V.S. APTE COMMERCE AND M.H. MEHTA SCIENCE COLLEGE, PALGHAR

PRADHAN MANTRI UCHCHATAR SHIKSHA ABHIYAN (PM-USHA)

EXHIBIT - 6

Details of Equipment to be procure

Department of

ZOOLOGY

Prepared by : Internal Quality Assurance Cell

LIST OF EQUIPMENT TO BE PROCURE

Sr. No.	Name of Instrument	Cost
1	Uv-Vis Spectrometer	500000
2	Microscope with LCD screen	100000
3	Gel Doc. System	400000
4	Horizontal electrophoresis	20000
5	Vertical electrophoresis	15000
6	Sonicator	250000
7	PCR Thermal Cycler	500000
8	Semi-Automatic Microtome	300000
9	Cooling Centrifuge	300000

1 UV SPECTROPHOTOMETER

Thermo Fisher Spectronic 200

Uses:

The UV Spectrophotometer, specifically the Thermo Fisher Spectronic 200 model, is a fundamental analytical instrument used for measuring the absorbance of light by molecules in the ultraviolet-visible (UV-Vis) range. This instrument has several uses for undergraduate students across various scientific disciplines:

Quantitative Analysis: Undergraduate chemistry students often use UV-Vis spectrophotometers to perform quantitative analysis of solutions containing absorbing species. They can determine the concentration of a solute in a sample by measuring its absorbance and using the Beer-Lambert law.

Kinetics Studies: Students studying chemical reactions can use the Spectronic 200 to monitor reaction kinetics by measuring the change in absorbance over time. This provides insights into reaction rates and mechanisms.

Biomolecular Analysis: Students in zoology and biochemistry can utilize the UV-Vis spectrophotometer to quantify biomolecules such as nucleic acids, proteins, and enzymes. The instrument is essential for experiments involving nucleic acid quantification, protein concentration determination, and enzyme activity assays.

Quality Control: UV-Vis spectrophotometers are commonly employed in industries such as pharmaceuticals, food, and beverages for quality control purposes. Undergraduates can learn about ensuring the consistency and integrity of products through absorbance measurements.

Environmental Monitoring: Students in environmental science can use the instrument to measure absorbance spectra of water samples to detect pollutants, contaminants, and other analytes affecting water quality.

Teaching and Demonstrations: UV-Vis spectrophotometers are often used as teaching tools to illustrate concepts of spectroscopy and analytical techniques. Students can learn about instrument operation, calibration, and data interpretation through hands-on experience.

Research Projects: Incorporating the Spectronic 200 into undergraduate research projects enables students to explore various applications of UV-Vis spectroscopy and contribute to scientific investigations.

UV-Vis Absorption Spectra: Students can generate and analyze UV-Vis absorption spectra, helping them understand the electronic transitions and molecular properties of different compounds.

Spectral Analysis: Learning to interpret absorbance spectra aids in identifying compounds based on their characteristic absorption peaks.

Laboratory Techniques: Operating the Spectronic 200 fosters skills in instrument handling, sample preparation, and data analysis that are valuable for future scientific endeavors.

Interdisciplinary Applications: The UV-Vis spectrophotometer's versatility allows students from different scientific backgrounds to collaborate on interdisciplinary projects.

2	MICROSCOPE WITH LED SCREEN

Uses:

The Olympus LED MX 21i microscope with an integrated LED screen is a modern and user-friendly tool that offers several advantages for undergraduate students in various scientific disciplines. Here are some of the uses and benefits of the Olympus LED MX 21i microscope for students:

Cellular and Microscopic Biology: Students in zoology and life sciences can use the microscope to study cellular structures, tissues, and microorganisms. The integrated LED screen provides a convenient way to observe and document biological specimens without the need for additional eyepieces or external displays.

Histology and Pathology: The microscope can be used for histological studies, enabling students to examine tissue samples and gain insights into disease processes and cellular abnormalities.

Teaching and Demonstrations: The LED screen microscope is ideal for classroom settings, allowing instructors to project the microscope's view to a larger audience. This is particularly useful for teaching and demonstrating microscopy techniques and specimen observations.

Ease of Use: The integrated LED screen eliminates the need for students to adjust eyepieces, making the microscope easier to use and reducing the risk of eye strain during extended periods of observation.

Digital Documentation: The microscope's LED screen allows students to capture images and videos of their observations directly. This is valuable for creating lab reports, presentations, and research documentation.

Field Studies: The portable nature of the microscope makes it suitable for field studies and outdoor research, enabling students to conduct observations and analyses in real-world environments.

Medical Studies: For students, the microscope can be used to learn about human anatomy and various medical conditions through the examination of prepared slides.

Microscopy Techniques: The microscope can support various microscopy techniques, such as bright field, phase contrast, and dark field microscopy, providing students with a diverse range of observation methods.

Interdisciplinary Applications: Students from different scientific disciplines, such as biology, chemistry, geology, and materials science, can benefit from the microscope's versatility and adapt it to their specific research or studies.

Research Projects: Undergraduate research projects that involve microscopic analyses can make use of the LED MX 21i microscope for detailed visualizations and data collection.

Digital Fluorescence Imaging: If the microscope is equipped with fluorescence capabilities, students can explore fluorescence microscopy techniques for visualizing specific molecules within samples.

3 GEL DOCUMENTATION SYSTEM

Thermo Fisher Bright FL 1500

Uses:

The Thermo Fisher iBright FL 1500 Gel Documentation System is a powerful tool commonly used in molecular biology laboratories for visualizing and documenting electrophoresis gels, including DNA, RNA, and protein gels. This instrument offers various benefits and applications for undergraduate students:

DNA, RNA, and Protein Electrophoresis: Undergraduate students studying molecular biology can use the iBright FL 1500 to visualize and document DNA, RNA, and protein gels following gel electrophoresis experiments. This helps them analyze sample sizes, verify the success of amplification reactions, and assess the purity of isolated nucleic acids.

Western Blot Imaging: The system can be used for imaging Western blots, a common technique for detecting specific proteins within complex mixtures. Students can learn about antibody-based detection methods and quantification of protein expression levels.

Nucleic Acid Fragment Sizing: Students can determine the size of DNA fragments or RNA transcripts by comparing their migration distances on the gel with molecular weight markers.

Gel Documentation: The iBright FL 1500 system enables students to capture high-resolution gel images, aiding in documentation, analysis, and sharing of experimental results.

Quantification of Bands: The instrument's software allows students to quantify the intensity of bands on the gel, facilitating accurate comparisons and data analysis.

Teaching and Lab Demonstrations: In educational settings, instructors can use the iBright FL 1500 to demonstrate gel electrophoresis principles and techniques to students, enhancing their understanding of molecular biology concepts.
Research Projects: Undergraduate research projects that involve gel-based analyses, such as genotyping, gene expression studies, and DNA fingerprinting, can benefit from the instrument's capabilities.

Publication-Quality Images: The system's high-quality imaging and software tools enable students to produce images suitable for presentations, lab reports, and scientific publications.

Data Management: The iBright FL 1500's software facilitates organization and management of gel images and associated metadata, promoting good data practices.

Fluorescence Detection: If the system is equipped with fluorescence capabilities, students can visualize and document fluorescently labeled samples, such as DNA intercalating dyes or fluorescently tagged antibodies.

Multi-Purpose Imaging: The system's versatility allows it to be used for various applications beyond gel documentation, such as chemiluminescence imaging for protein detection.

Technical Skills: Operating the iBright FL 1500 introduces students to instrumentation, image analysis software, and laboratory techniques commonly used in molecular biology research.

4 HORIZONTAL ELECTROPHORESIS

Techno source
Submariner RC

Uses:

The Submariner RC Horizontal Electrophoresis System by Techno Source is a laboratory instrument commonly used in molecular biology and biochemistry for separating and analyzing DNA, RNA, and proteins based on their size during gel electrophoresis. Here are some of the uses and benefits of the Submariner RC Horizontal Electrophoresis System for undergraduate students:

DNA and RNA Fragment Separation: Undergraduate students studying genetics, molecular biology, and related fields can use the Submariner RC system to separate DNA fragments and RNA transcripts based on their molecular weights. This allows for the analysis of genetic variations, sequencing products, and gene expression patterns.

Protein Separation: Students in biochemistry can employ the system to separate proteins based on their molecular weights. This is essential for protein purification, characterization, and understanding protein interactions.

Agarose Gel Electrophoresis: The Submariner RC system facilitates agarose gel electrophoresis, which is a widely used method for separating nucleic acids. Students can learn about gel preparation, sample loading, and running electrophoresis experiments.

PCR Product Analysis: Undergraduates can analyze the results of polymerase chain reaction (PCR) experiments by loading and running the PCR products on

the Submariner RC gel. This helps confirm successful amplification and assess product sizes.

Restriction Enzyme Digestion Analysis: Students can analyze restriction enzyme digests of DNA samples to verify the presence of specific DNA fragments or to determine the efficiency of enzyme digestion.

Teaching and Lab Exercises: In educational settings, instructors can use the Submariner RC system to demonstrate gel electrophoresis principles and techniques, allowing students to gain hands-on experience in a controlled environment.

Molecular Biology Research Projects: Undergraduate research projects that involve DNA analysis, gene mapping, or mutation detection can benefit from the system's capabilities for visualizing and analyzing nucleic acids.

Staining and Visualization: The Submariner RC system allows students to stain DNA or RNA fragments with fluorescent or intercalating dyes, enhancing their visualization under UV light.

Size Determination: Students can determine the approximate sizes of DNA fragments by comparing their migration distances with molecular weight markers.

Data Analysis: The images generated from electrophoresis experiments can be analyzed using software to quantify band intensity and gather data for further analysis.

Laboratory Techniques: Operating the Submariner RC system introduces students to gel casting, sample loading, running electrophoresis, and gel visualization.

Problem-Solving Skills: Troubleshooting issues that arise during electrophoresis experiments can help students develop problem-solving skills and enhance their understanding of experimental techniques.

5 VERTICAL ELECTROPHORESIZ

Techno Source
MicroKin

Uses:

The MicroKin Vertical Electrophoresis System by Techno Source is a laboratory instrument used for protein and nucleic acid separation based on size during electrophoresis. Vertical electrophoresis systems like the MicroKin are commonly used for higher-resolution separations and are particularly useful for applications that involve protein analysis. Here are some of the uses and benefits of the MicroKin Vertical Electrophoresis System for undergraduate students:

Protein Electrophoresis: Undergraduate students in biochemistry and related fields can use the MicroKin system to separate proteins based on their molecular weights. This is essential for studying protein composition, purification, and structural analysis.

Native-PAGE and SDS-PAGE: The MicroKin system can be used for both native polyacrylamide gel electrophoresis (Native-PAGE) and sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE). Students can learn about different gel types and their applications.

Enzyme Characterization: The system is valuable for enzyme characterization, allowing students to assess the purity and activity of isolated enzymes.

Protein-DNA Interactions: Undergraduates can study protein-DNA interactions by running DNA-binding assays using the MicroKin system.

Western Blotting Applications: The separated proteins can be transferred onto membranes for Western blotting analysis, enabling students to detect specific proteins using antibodies.

Protein Purification Analysis: The MicroKin system can be used to assess the efficiency of protein purification protocols by comparing the protein profiles before and after purification.

Electrophoresis Optimization: Students can learn how to optimize electrophoresis conditions, including gel concentration, buffer composition, and running voltage, to achieve optimal separation results.

Teaching and Demonstrations: In educational settings, instructors can use the MicroKin system to teach students about vertical gel electrophoresis principles and techniques.

Molecular Biology Research: Undergraduate research projects involving protein analysis, protein-protein interactions, and protein expression can utilize the system's capabilities.

Staining and Visualization: Students can stain proteins with Coomassie Brilliant Blue or silver staining techniques to visualize protein bands.

Data Analysis: The images of separated proteins obtained from the MicroKin system can be analyzed using software to quantify band intensity and perform data analysis.

Laboratory Skills: Operating the MicroKin system helps students develop skills in gel preparation, sample loading, electrophoresis setup, and gel visualization.

Problem-Solving: Troubleshooting issues that arise during electrophoresis experiments can enhance students' problem-solving abilities and critical thinking skills.

6 ULTRASONIC PROBE SONICATOR

IG-96A By I Gene

Uses:

Cell Disruption and Lysis: Undergraduate students in molecular biology and biotechnology can use the sonicator to break down cell walls and membranes, releasing cellular contents such as proteins, nucleic acids, and organelles.

DNA and RNA Shearing: The sonicator can be used to fragment DNA and RNA molecules to specific sizes, which is essential for applications like next-generation sequencing library preparation and genetic analysis.

Chromatin Shearing: Students studying genomics and epigenetics can utilize the sonicator to shear chromatin for ChIP assays and other experiments involving protein-DNA interactions.

Homogenization: The instrument can homogenize tissues, helping to ensure uniformity and consistency in samples for further analysis.

Particle Dispersion: Undergraduate students in materials science and chemistry can use the sonicator to disperse nanoparticles, pigments, and other particles in various solutions.

Emulsification: The sonicator can be used to create stable emulsions, which are useful in various industries including food, cosmetics, and pharmaceuticals.

Deagglomeration: Students can use the sonicator to break apart aggregates or agglomerates in suspensions, improving the dispersion of particles.

Nanoparticle Synthesis: The sonicator can be employed in the synthesis of nanoparticles, which have applications in medicine, electronics, catalysis, and more.

Drug Formulation: The sonicator can assist in preparing drug formulations by improving the solubility of drugs and enhancing drug delivery systems.

Teaching and Demonstrations: In academic settings, the sonicator can be used by instructors to demonstrate the principles of ultrasonic disruption and various applications to students.

Laboratory Techniques: Operating the iGene IG-96A Ultrasonic Sonicator introduces students to proper instrument usage, experimental setup, and safety protocols.

Research Projects: Undergraduate research projects that involve sample preparation, material processing, or particle manipulation can benefit from the capabilities of the iGene IG-96A model.

Interdisciplinary Applications: The sonicator's versatility allows students from different scientific backgrounds to explore its applications in their respective fields.

7 PCR THERMAL CYCLER

Thermo Fisher
Mini Amp Thermal Cycler

Uses:

DNA Amplification: Undergraduate students in molecular biology, genetics, and related fields can use the Mini Amp Thermal Cycler to amplify specific DNA sequences for various applications, such as genotyping, gene expression analysis, and DNA sequencing.

PCR Optimization: Students can learn how to optimize PCR reactions by adjusting primer concentrations, annealing temperatures, and reaction conditions to achieve optimal results.

Gene Cloning: The thermal cycler is essential for DNA cloning, allowing students to amplify DNA fragments for insertion into vectors.

Mutation Analysis: Undergraduates can use the Mini Amp Thermal Cycler to perform site-directed mutagenesis by introducing specific mutations into DNA sequences.

Diagnostic PCR: Students can learn about diagnostic applications of PCR, such as detecting the presence of pathogens, genetic disorders, or mutations.

Teaching and Demonstrations: Instructors can use the thermal cycler to teach students about PCR principles and techniques, helping them gain hands-on experience.

Research Projects: Undergraduate research projects that involve molecular biology techniques and DNA analysis can benefit from the capabilities of the Mini Amp Thermal Cycler.

Primer Design: Students can design primers for specific PCR reactions and assess their effectiveness through amplification experiments.

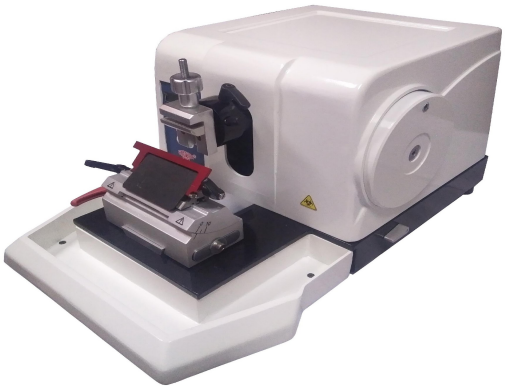
Qualitative and Quantitative Analysis: The thermal cycler can be used for both qualitative (presence/absence) and quantitative (real-time) PCR analyses.
Genetic Screening: Students can use PCR to screen for genetic traits, mutations, or polymorphisms in various organisms.

Time-Efficient Experiments: The Mini Amp Thermal Cycler's rapid cycling capabilities enable students to complete experiments in a shorter time compared to traditional thermal cyclers.

Data Interpretation: Students can learn how to analyze PCR results, interpret electrophoresis gels, and assess the quality of amplified DNA products.

PCR Training: Operating the Mini Amp Thermal Cycler introduces students to proper pipetting techniques, reaction setup, and thermal cycling protocols.

8 SEMI-AUTOMATIC ROTARY MICROTOME



Semi Automatic Microtome By Weswox

Uses:

Histology and Pathology: Undergraduate students in biology, medical laboratory sciences, and related fields can use the microtome to prepare tissue sections for histological analysis. These sections are used to study tissue structures, identify abnormalities, and diagnose diseases.

Sample Preparation: The microtome is essential for creating thin and uniform tissue sections that can be mounted on slides and stained for microscopic examination.

Research Projects: Students engaged in research projects involving tissue analysis, disease studies, or comparative anatomy can benefit from the microtome's ability to prepare high-quality tissue sections.

Tissue Engineering: Students studying tissue engineering and regenerative medicine can use the microtome to prepare tissue sections for assessing cell growth, scaffold integration, and tissue structure.

Medical Education: In medical education, the microtome is used to prepare tissue sections for teaching purposes, allowing students to learn about tissue anatomy and pathology.

Laboratory Techniques: Operating the semi-automatic rotary microtome introduces students to proper handling of delicate tissues, blade adjustments, and sectioning procedures.

Consistency: The semi-automatic feature ensures more consistent section thickness compared to manual microtomes, enhancing the quality of prepared sections.

Time Efficiency: Semi-automatic microtomes streamline the sectioning process, allowing students to prepare more samples in less time compared to manual methods.

Microscopy Practice: Students can practice slide preparation and microscopic observation using the tissue sections they create with the microtome.

Practical Skills: Learning to operate the microtome equips students with technical skills that are valuable in clinical laboratories, research settings, and medical professions.

Quality Control: Students can learn about the importance of maintaining proper calibration and blade sharpness to ensure high-quality sectioning results.

Precision: The microtome's rotary mechanism allows students to control the thickness of the sections with precision, ensuring accurate representation of tissue structures.

Sample Preservation: Proper sectioning techniques help preserve tissue morphology, making it easier to visualize specific structures under the microscope.

9 COOLING CENTRIFUGE

CM-8 Plus Remi Motors

Uses:

Sample Preparation: Undergraduate students in various scientific disciplines can use the cooling centrifuge to prepare samples for analysis by separating components like cells, subcellular organelles, proteins, nucleic acids, and more.

Cell Culture: Students working with cell cultures can use the cooling centrifuge to pellet cells, remove supernatant, and isolate cell fractions.

Protein Purification: The centrifuge is used for pelleting proteins, removing cell debris, and isolating proteins from cell lysates or culture media.

Nucleic Acid Extraction: Students can use the cooling centrifuge to separate DNA, RNA, and other nucleic acids from biological samples or reaction mixtures.

Enzyme Assays: The centrifuge can be used in enzyme assays to separate reaction components, such as enzymes and substrates, for quantification.

Clinical Diagnostics: In medical laboratory sciences, the cooling centrifuge can be used for analyzing blood samples, separating plasma or serum, and performing diagnostic tests.

Gradient Separations: The cooling centrifuge can perform density gradient centrifugation, which separates particles based on their buoyant densities. This is useful for purifying certain biological components.

Immunoprecipitation: Students studying immunology can use the cooling centrifuge for immunoprecipitation assays to isolate protein complexes.

Sample Concentration: The centrifuge can be used to concentrate samples by pelleting particles or molecules, which is particularly useful in applications like concentrating viruses.

Cooling Samples: The cooling feature of the centrifuge allows students to perform centrifugation while maintaining low temperatures, preserving sample integrity.

Research Projects: Undergraduate research projects that involve sample processing, separation, or purification can benefit from the capabilities of the Remi CM 8 Plus Cooling Centrifuge.

Laboratory Techniques: Operating the cooling centrifuge introduces students to rotor selection, sample loading, centrifugation protocols, and handling temperature-sensitive samples.

Quality Results: The cooling feature helps prevent sample degradation during centrifugation, leading to higher-quality results.

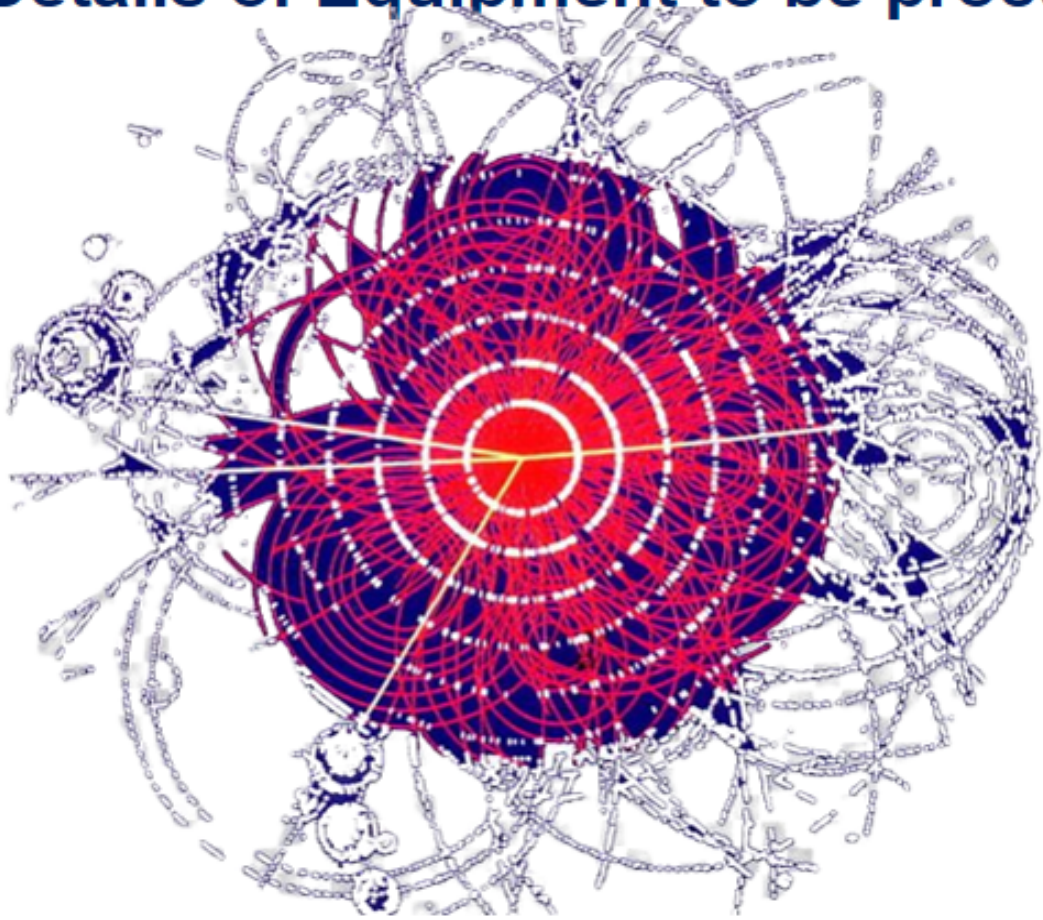
Sonopant Dandekar Shikshan Mandali's

SONOPANT DANDEKAR ARTS, V.S. APTE COMMERCE AND M.H. MEHTA SCIENCE COLLEGE, PALGHAR

PRADHAN MANTRI UCHCHATAR SHIKSHA ABHIYAN (PM-USHA)

EXHIBIT - 7

Details of Equipment to be procure



Department of

PHYSICS

Prepared by : Internal Quality Assurance Cell

LIST OF EQUIPMENT TO BE PROCURE

Sr. No.	Instruments	Cost (Rs.)
1	Tubular Furnace	1,60,000/-
2	One channel Potentiostat	4,50,000/-
3	Magnetic Stirrer with heating	20,000/-
4	Centrifuge Machine	50,000/-
5	Hot air oven(1000°C)	40,000/-
6	Xenon Lamp(1000W)	80,000/-
7	Solar Simulator	3,00,000/-
8	Autoclave supercritical system(1 Litre)	3,40,000/-
9	Ultrasonic sonication bath	40,000/-
10	Weighing Scale Machine(0.01mg)	70,000/-

1	TUBULAR FURNACE

Tube furnaces are used for a broad range of thermal processes, including inorganic and organic purification; accelerated aging; annealing; coating; drying

Rs. 1,60,000/-

2	ONE CHANNEL POTENTIOSTAT

A potentiostat is an analytical instrument designed to control the working electrode's potential in a multiple-electrode electrochemical cell.

Rs. 4,50,000/-

3	MAGNETIC STIRRER WITH HEATING

The primary use of a magnetic stirrer or hot plate with a magnetic stirrer is to conduct biological and chemical experiments by mixing two components.

Rs. 20,000/-

4	CENTRIFUGE MACHINE

Centrifuges separate heterogeneous mixtures into their various components – liquids in liquids, solids in liquids, and liquids in gases, based on the different densities of the components.

Rs. 50,000/-

5	HOT AIR OVEN(1000°C)

A hot air oven is used to sterilize the product in a particular period of time under specific conditions like humidity, pressure, and other

Rs. 40,000/-

6	XENON LAMP(1000W)

For demanding absorbance and fluorescence applications involving source spectral scanning and high-intensity broadband sources.

Rs. 80,000/-

7	SOLAR SIMULATOR

A solar simulator (also artificial sun or sunlight simulator) is a device that provides illumination approximating natural sunlight. The purpose of the solar simulator is to provide a controllable indoor test facility under laboratory conditions.

Rs. 3,00,000/-

8	AUTOCLAVE SUPERCRITICAL SYSTEM(1 LITRE)

Autoclaves operate at high temperatures and pressure for extract fluid.

Rs. 3,40,000/-

EXHIBIT - 8

Details of Equipment to be procure

LIST OF EQUIPMENT TO BE PROCURE

Sr. No.	Name of Instrument	Cost
1	UV-Visible Spectrophotometer	415000
2	Colorimeter	6800
3	Compound Light Microscope	8050
4	Hot Air Oven	16000
5	pH Meter	7500
6	Turbidity Meter	9400
7	Conductivity meter	7750
8	Centrifuge Machine	8000
9	Weighing Balance	49000
10	Microtomy	22500

1 UV-VISIBLE SPECTROPHOTOMETER

Chlorophyll and Photosynthesis Studies: UV-Vis spectrophotometers are used to measure the absorbance and reflectance spectra of chlorophyll and other photosynthetic pigments. Students can study how these pigments absorb and utilize light energy during photosynthesis. They can also investigate factors affecting pigment concentrations, such as light intensity and nutrient availability.

Pigment Identification: UV-Vis spectrophotometry helps students identify different plant pigments based on their absorption spectra. This is particularly important for understanding the diversity of pigments in various plant species and their roles in plant physiology.

Phytochemical Analysis: UV-Vis spectrophotometry is used to analyze various phytochemicals in plants, such as flavonoids, phenols, and anthocyanins. Students can learn about the presence and concentrations of these compounds and their potential roles in plant defense mechanisms and human health.

Nutrient Analysis: Students can use UV-Vis spectrophotometry to determine the concentrations of nutrients in plant tissues, such as nitrogen, phosphorus, and potassium. This information is important for understanding plant growth and health.

Stress and Environmental Studies: UV-Vis spectrophotometry allows students to study how plants respond to environmental stressors, such as pollutants, UV radiation, and drought. They can analyze changes in pigment concentrations and other biochemical markers under different stress conditions.

Quality Control in Agriculture: UV-Vis spectrophotometers can be used to assess the quality of agricultural products, such as fruits, vegetables, and herbs. Students can learn how to determine the ripeness, nutritional content, and freshness of these products using spectrophotometric techniques.

Teaching Analytical Techniques: Introducing students to UV-Vis spectrophotometry helps them develop essential skills in experimental design, sample preparation, data collection, and analysis. These skills are valuable for future careers in research and academia.

Experimental Design: Students can design experiments to investigate the effects of light conditions, temperature, and other variables on plant pigments and compounds. UV-Vis spectrophotometry provides quantitative data that can be used to support their findings.

Quantitative Analysis: UV-Vis spectrophotometers can be used for quantitative analysis of specific compounds. Students can learn to create standard curves, perform dilution series, and calculate concentrations of various plant-related substances.

Research Projects: Students can conduct research projects using UV-Vis spectrophotometry to explore specific botanical questions or hypotheses, deepening their understanding of plant biology and chemistry.

2 COLORIMETER

Quantification of Pigments: Colorimeters are used to measure the concentration of pigments, such as chlorophylls and carotenoids, in plant tissues. Students can extract pigments from leaves, flowers, or fruits and measure their absorbance at specific wavelengths. This helps students understand pigment distribution and variation across different plant parts and species.

Photosynthetic Activity: Colorimeters can be employed to assess the photosynthetic activity of plants. By measuring changes in absorbance before and after exposing leaves to light, students can study the rate of photosynthesis and the impact of environmental factors.

Anthocyanin Content: Anthocyanins are water-soluble pigments responsible for red, purple, and blue colors in many plants. Colorimeters can quantify anthocyanin content in plant extracts, allowing students to investigate how environmental factors influence their production.

pH Measurement: Colorimeters can be used to measure pH changes in plant extracts or solutions. This is important for understanding how pH influences nutrient availability, enzyme activity, and other physiological processes in plants.

Enzyme Activity: Colorimetric enzyme assays involve monitoring color changes due to enzymatic reactions. Students can explore enzyme activity related to plant metabolism, such as catalase in hydrogen peroxide breakdown, using colorimetric methods.

Detection of Plant Diseases: Some plant diseases or infections can lead to color changes in plant tissues. Colorimeters can be used to quantify these color changes, aiding in the early detection and monitoring of plant health.

Teaching Basic Spectrophotometry Concepts: Colorimeters provide an introduction to spectrophotometric principles, allowing students to understand concepts like Beer-Lambert's Law, absorbance, transmittance, and the relationship between concentration and absorbance.

Comparative Studies: Students can compare colorimetric measurements of different plant species or plant parts to understand variations in pigment content and physiological responses to environmental conditions.

Experimental Design and Data Analysis: Using colorimeters requires students to design experiments, prepare samples, collect data, and analyze results. This hands-on experience enhances their skills in experimental design and data interpretation.

Project-based Learning: Colorimeters can be used in student research projects, encouraging independent inquiry into specific botanical questions or hypotheses related to pigments, metabolic pathways, or plant responses to stress.

3 COMPOUND LIGHT MICROSCOPE

Cellular Anatomy: Botany students can examine the microscopic structure of plant cells, including cell walls, nuclei, chloroplasts, and other organelles. This helps in understanding plant morphology and function.

Tissue Analysis: Microscopes enable students to study different types of plant tissues such as epidermal, vascular, and ground tissues. They can observe tissue arrangement, cell types, and specialized structures like trichomes.

Reproductive Structures: Students can examine the reproductive structures of plants, such as pollen grains, ovules, and plant embryos, to understand plant reproduction and development.

Leaf Morphology: Microscopes aid in the analysis of leaf structure, including stomata, guard cells, and specialized cells responsible for photosynthesis and gas exchange.

Pathogen Identification: Microscopic examination can help identify and study plant pathogens like fungi, bacteria, and viruses that affect plant health.

Root Systems: Microscopy allows for the observation of root structures, root hairs, and mycorrhizal associations, which are essential for nutrient uptake and soil interactions.

Pollen Analysis: Microscopy is used to study pollen morphology, helping in plant identification, pollen dispersal studies, and understanding pollination mechanisms.

Algae and Protists: In botany studies, microscopes are also used to observe and classify various algae and protists, which are essential components of aquatic ecosystems.

Educational Demonstrations: Microscopes serve as essential tools in educational settings, allowing instructors to demonstrate botanical concepts and phenomena to students.

4 HOT AIR OVEN

Seed Germination Studies: Botany students can use hot air ovens to simulate germination conditions and determine the optimal temperature range for different plant species. This helps in understanding the germination requirements of various plants and studying the effects of temperature on germination rates.

Drying Plant Material: Hot air ovens are used to dry plant samples quickly and efficiently. This is essential for preparing dried samples for further analysis, such as determining the water content of plant tissues or preserving plant specimens for herbarium collections.

Soil Sterilization: Students can sterilize soil samples using hot air ovens to eliminate microbial contaminants, pathogens, and weed seeds. Sterilized soil is important for conducting controlled experiments in plant growth and soil ecology.

Dehydration of Plant Material: Some botanical studies require dehydrated plant material for analysis, such as measuring dry weight or studying plant secondary metabolites. Hot air ovens facilitate the removal of moisture from plant samples.

Microbial Culture Preparation: In certain botany studies, researchers need to prepare sterile culture media for microbial studies or tissue culture. Hot air ovens can be used to sterilize petri dishes, tubes, and other equipment before use.

Drying Herbarium Specimens: Hot air ovens help in drying plant specimens collected for herbarium purposes. Proper drying prevents decay and fungal growth, preserving the plant samples for future reference and research.

Temperature-Dependent Studies: Botany students can investigate the effects of temperature on various plant processes, such as enzyme activity, photosynthesis rates, and growth. Hot air ovens provide a controlled environment for conducting these experiments.

Experiment Preparation: Students can prepare experimental setups by sterilizing equipment, containers, and growth media using hot air ovens. This ensures aseptic conditions for accurate and reliable results.

Drying Seeds for Storage: Drying seeds before storage helps prevent mold growth and seed deterioration. Hot air ovens are used to dry seeds to a suitable moisture content for long-term storage.

Teaching Laboratory Techniques: Demonstrations using hot air ovens can teach students essential laboratory techniques, such as proper handling of samples, use of temperature controls, and ensuring safety protocols during heating procedures.

Preparation of Plant Extracts: Some plant studies involve preparing extracts for chemical analysis. Hot air ovens can aid in evaporating solvents and concentrating plant compounds.

5 pH METER

Soil pH Analysis: Botany students can use pH meters to measure the pH of soil samples. Soil pH affects nutrient availability and microbial activity, which influence plant growth and health. By analyzing soil pH, students can better understand how pH affects plant growth and choose appropriate plants for specific soil conditions.

Plant Physiology Experiments: pH meters are used in various physiological experiments to understand how pH affects processes like enzyme activity, photosynthesis, and nutrient absorption. Students can investigate the relationship between pH and these physiological processes.

Water Quality Studies: pH meters are used to assess the pH of water sources like ponds, lakes, and streams. Understanding water pH is important for studying aquatic plant life and the impact of water quality on ecosystems.

Plant Tissue Analysis: pH meters can be used to measure the pH of plant tissue extracts. This is valuable for studying the pH of cell sap, which can provide insights into ion transport and regulation within plant cells.

Plant-Microbe Interactions: pH is involved in interactions between plants and microorganisms. Students can explore how pH affects the colonization of plant roots by beneficial microbes and the impact of pH on disease development.

Comparative Studies: Students can compare the pH of different plant species, plant parts, or growth conditions to explore variations in pH tolerance and adaptation.

Teaching Concepts: pH meters can be used as educational tools to teach students about pH, acid-base chemistry, and their relevance to plant biology.

Data Collection and Analysis: Using pH meters involves data collection, interpretation, and analysis. Students can learn to generate meaningful results and draw conclusions based on pH measurements.

6 TURBIDITY METER

Water Quality Assessment: Turbidity meters can be used to assess the quality of water sources used for irrigation, hydroponics, or aquatic plant studies. High turbidity levels can indicate sediment runoff, pollution, or other factors that could affect plant health.

Nutrient Transport: Turbidity measurements can provide insights into the transport of nutrients and particles in water. This is relevant for understanding nutrient runoff from agricultural fields and its impact on water bodies and downstream plant communities.

Sediment Analysis: In sediment studies, where sediment composition and distribution are examined, turbidity meters can aid in quantifying suspended sediment levels in water samples.

Algal Bloom Detection: Turbidity can increase due to algal blooms, affecting light availability for other aquatic plants. Students can use turbidity measurements to detect and monitor algal blooms and their potential impacts.

Teaching Environmental Monitoring: Incorporating turbidity meters into botany education can introduce students to environmental monitoring techniques and the importance of water quality for plant ecosystems.

Project-based Learning: Students can design and execute experiments to investigate the relationship between turbidity, light availability, and plant growth in aquatic environments.

7 CONDUCTIVITY METER

- **Soil Nutrient Levels:** Conductivity meters are used to measure the electrical conductivity of soil extracts or soil solutions. This measurement is related to the concentration of dissolved ions, including nutrients like salts and minerals. Students

can use conductivity measurements to assess soil fertility and nutrient availability for plant growth.

- **Salinity Studies:** Botany students can investigate the impact of salinity on plant growth and health by measuring the electrical conductivity of soil, water, or nutrient solutions. High conductivity levels can indicate increased salt content, which may stress plants and affect water uptake.

- **Water Quality Analysis:** In studies involving water bodies like ponds, lakes, or streams, conductivity measurements can provide insights into water quality. Changes in conductivity may indicate pollution, runoff, or other factors affecting plant and aquatic life.

- **Determination of Soil Moisture:** Soil moisture affects conductivity since water conducts electricity. By measuring soil conductivity, students can indirectly assess soil moisture levels and learn about water availability to plants.

- **Environmental Stress:** High conductivity in soil or water can stress plants due to excess salts or other solutes. Students can explore how changes in conductivity affect plant physiology and adaptation to stress.

- **Comparative Studies:** Conductivity measurements can be used to compare the ion content and nutrient levels in different soil types, growth media, or environmental conditions.

- **Research Projects:** Students can design experiments to investigate the effects of different concentrations of salts or nutrients on plant growth and development.

- **Practical Laboratory Skills:** Learning to use conductivity meters effectively teaches students laboratory skills, including calibration, sample handling, and accurate data collection.

8 CENTRIFUGE MACHINE

- **Plant Tissue Homogenization:** Botany students can use centrifuges to homogenize plant tissues for further analysis. Centrifugation breaks down plant tissues and cell walls, allowing students to extract cellular components such as proteins, nucleic acids, and enzymes.

- **Cell Fractionation:** Centrifuges enable the separation of organelles and subcellular components from plant cells. Students can study the functions of various organelles by isolating them using centrifugation techniques.

- **Chloroplast Isolation:** Students can isolate chloroplasts using centrifugation to study their structure and function, including photosynthesis and pigment content.

- **Mitochondria Extraction:** Centrifuges aid in extracting mitochondria from plant cells for studying respiration, energy production, and metabolic processes.

- **Nucleic Acid Extraction:** Centrifugation is a crucial step in isolating DNA, RNA, and other nucleic acids from plant samples for molecular analysis and genetic studies.

- **Protein Fractionation:** Centrifugation can be employed to fractionate proteins based on their molecular weight or density. This is useful for studying protein composition and interactions.

- **Cell Density Gradients:** Centrifugation with density gradients allows students to separate different cell types or organelles based on their buoyant densities, aiding in purification and analysis.

- **Particle Sedimentation Studies:** Centrifuges are used to investigate sedimentation rates of plant particles in suspensions, which can be related to plant dispersal mechanisms and seed behavior.

- **Biological Research Projects:** Centrifuges are integral to many research projects, allowing students to explore specific questions related to plant physiology, molecular biology, and cellular processes.

9 WEIGHING BALANCE

Seed and Fruit Analysis: Botany students can weigh seeds, fruits, and other plant parts to study their size, weight distribution, and reproductive characteristics. This information is essential for understanding plant reproduction and propagation.

Plant Growth and Biomass: Weighing balances are used to measure plant biomass, allowing students to assess growth patterns, monitor changes in plant weight over time, and study factors influencing plant development.

Dried Sample Analysis: Weighing balances are crucial for determining the dry weight of plant samples after drying. This is essential for quantifying water content and accurately assessing nutrient concentrations.

Chemical Analysis: Students can use weighing balances to accurately measure reagents and chemicals for experiments involving plant nutrition, enzyme assays, and other chemical analyses.

Media Preparation: Weighing balances are used to accurately measure and mix growth media for tissue culture, hydroponic systems, and experiments involving plant growth in controlled environments.

Nutrient Solution Preparation: In hydroponics and nutrient studies, students can measure precise quantities of nutrients and solutions to ensure optimal growth conditions for plants.

Dilution Series: Weighing balances are used to prepare dilutions of solutions for experiments involving various concentrations of substances. This is important for dose-response studies and analytical techniques.

Seed Germination Experiments: Weighing balances are used to measure the mass of seeds before and after germination, helping students understand the changes in seed weight during the germination process.

Data Collection: Precise measurements of plant parts or samples using weighing balances contribute to accurate data collection and the reliability of experimental results.
Comparative Studies: Weighing balances allow students to compare the mass of different plant varieties, treatments, or conditions to explore variations in growth and physiology.

Project-based Learning: Students can design their experiments that involve using weighing balances to address specific botanical questions, encouraging critical thinking and problem-solving skills.

10 MICROTOMY

Tissue Anatomy: Microtomy allows students to create thin sections of plant tissues, such as leaves, stems, and roots. These sections can be stained and observed under a microscope to study the internal anatomy and organization of various plant parts.

Comparative Studies: Microtomy enables students to compare the anatomy and histology of different plant species, tissues, or developmental stages. These comparisons provide insights into evolutionary relationships and adaptations.

Vascular Tissue Analysis: Microtomy allows for the study of vascular tissues like xylem and phloem, helping students understand water and nutrient transport mechanisms within plants.

Root and Stem Cross-sections: Students can prepare cross-sections of roots and stems to observe the arrangement of tissues, such as epidermis, cortex, and vascular bundles. This provides insights into functions like support and nutrient storage.

Leaf Epidermis: Microtomy enables the preparation of leaf epidermal sections, which can be used to study stomata, trichomes, and other specialized structures on the leaf surface.

Research Projects: Students can design research projects involving microtomy to investigate specific questions related to plant anatomy, development, or responses to environmental factors.

Skill Development: Learning microtomy techniques introduces students to essential laboratory skills, including sample preparation, sectioning, staining, and slide mounting.

Botanical Illustration: Prepared slides can serve as references for botanical illustrations, aiding students in accurately depicting plant structures in their studies.

Sonopant Dandekar Shikshan Mandali's

SONOPANT DANDEKAR ARTS, V.S. APTE COMMERCE AND M.H. MEHTA SCIENCE COLLEGE, PALGHAR

PRADHAN MANTRI UCHCHATAR SHIKSHA ABHIYAN (PM-USHA)

EXHIBIT-9

Details of Soft Component Activities

Training Sessions

Prepared by : Internal Quality Assurance Cell

Innovative teaching pedagogy involves using creative and modern approaches to enhance the learning experience for students. These sessions are designed to help educators develop new strategies, techniques, and tools for teaching effectively.

Here are some details you might consider including in your training sessions:

1. **Title of the Training Sessions:**

   "Exploring Innovative Teaching Pedagogy: Enhancing Student Learning in the Digital Age"

2. **Overview:**

   Brief introduction to the importance of innovative teaching methods in today's education landscape.

   Explanation of how innovative pedagogy can engage students, promote critical thinking, and foster a deeper understanding of subjects.

3. **Target Audience:**

   Educators from various levels (K-12, higher education) and disciplines.
   School administrators interested in promoting innovative teaching practices.
   Teaching assistants and support staff.

4. **Key Topics Covered:**

   Introduction to Innovative Pedagogy: Understanding the concept and its benefits.
   Active Learning Strategies: Incorporating discussions, group activities, problem-solving exercises, and peer teaching.

   Technology Integration: Exploring digital tools, online platforms, and multimedia resources for interactive learning.

   Flipped Classroom Approach: Reversing traditional teaching methods by delivering content outside class and engaging in-depth discussions during class.

   Project-Based Learning: Designing projects that encourage hands-on experience, research, and collaboration.

Gamification and Simulation: Using game elements and simulations to make learning more engaging and immersive.

Personalized Learning: Adapting teaching methods to accommodate diverse learning styles and preferences.

Assessment and Feedback: Implementing innovative assessment methods and providing timely, constructive feedback.

5. Training Format:

Workshops: Hands-on sessions where participants can experience and practice using innovative teaching techniques.

Presentations: Sharing research findings, case studies, and examples of successful implementation.

Group Discussions: Encouraging educators to share their experiences and ideas for incorporating innovative methods.

6. Duration:

Depending on the depth of content, the training sessions could range from a single half-day session to a multi-day workshop.

7. Trainers:

Experienced educators, instructional designers, and experts in educational technology.

Guest speakers who have successfully implemented innovative pedagogy in their own classrooms.

8. Outcomes:

Participants will gain a deeper understanding of various innovative teaching methods.

Educators will be equipped to apply these techniques to their own teaching contexts.

Increased engagement and interaction in the classroom, leading to enhanced student learning outcomes.

9. Materials:

Handouts, presentations, and resources related to each topic covered.

List of recommended books, articles, and online resources for further exploration.

10. Follow-Up:

Provide opportunities for ongoing support and collaboration through online forums or networking events.

Gather feedback from participants to continuously improve future training sessions.

Remember to tailor the details of your training sessions to the specific needs and preferences of your target audience.

Sonopant Dandekar Shikshan Mandali's

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PRADHAN MANTRI UCHCHATAR SHIKSHA ABHIYAN (PM-USHA)

EXHIBIT-10

Details of Soft Component Activities

Establishment of Agro Based Skill development Centre, supporting regional habitants in Palghar District

Prepared by : Internal Quality Assurance Cell

Establishment of Agro Based Skill development Centre, supporting regional habitants in Palghar District

The establishment of an Agro-Based Skill Development Centre in Palghar District aligns well with the National Education Policy (NEP) of 2020. This center aims to play a pivotal role in addressing the needs and aspirations of the local population, particularly in rural areas. Here's how it connects with the NEP and why it's important:

a. **Vocational and Practical Learning :** The NEP aims to promote vocational and practical learning. An Agro-Based Skill Development Centre would provide training in various aspects of agriculture, horticulture, animal husbandry, agri-processing, and more. This aligns with the NEP's vision of offering education that is not just theoretical but also experiential and skill-oriented.

b. **Holistic Development (NEP Objective):** The skill development center can contribute to the holistic development of individuals by imparting skills related to agro-based activities. This aligns with the NEP's emphasis on nurturing a well-rounded individual who can contribute effectively to society.

c. **Local Culture :** By delivering training in the local language, the center can make learning more accessible and culturally relevant for the residents of Palghar District. The center can incorporate both traditional and modern agricultural practices, helping to preserve local knowledge while embracing innovation.

d. **Equitable Access:** Establishing such a center in Palghar District can help bridge the urban-rural divide in terms of education and skill development. It can ensure that even rural populations have access to quality vocational training and skill development opportunities.

e. **Sustainable Development (NEP Principle):** The center's focus on agro-based skills is in line with sustainable development principles. It can promote environmentally friendly farming practices, sustainable resource management, and agricultural innovation, contributing to the ecological balance of the region.

Overall, the Agro-Based Skill Development Centre in Palghar District not only addresses the local needs and aspirations of the learners and regional population but also can lead to the holistic development of individuals, empowerment of rural communities, and sustainable agricultural practices, contributing to the social and economic development of the region.

A) Types of Courses to be undertaken at the Centre:

1. **Horticulture**: It encompasses a wide range of skills related to cultivation, management, and processing of fruits, vegetables, flowers, and ornamental plants. A Horticulture-Based Skill Development Centre would offer practical training in various aspects of horticulture, including cultivation techniques, pest management, irrigation, and post-harvest handling. This hands-on approach aligns with the NEP's emphasis on vocational and experiential learning.

2. **Goat & Cow rearing**: It encompasses a range of skills related to animal husbandry, management, and value addition. A Goat Rearing Skill Development Centre would offer practical training in various aspects of animal husbandry, including breed selection, nutrition, healthcare, housing, and marketing.

3. **Vermiculture:** It is the process of using earthworms to decompose organic material, has multiple applications in agriculture, waste management, and soil health improvement. It would offer hands-on training in various aspects of vermiculture, including setting up vermiculture units, managing organic waste, producing vermicompost, and using it in farming and marketing it.

4. **Kitchen gardening:** It refers to small plots of land used for growing fruits, vegetables, herbs, and spices, offer numerous benefits including improved nutrition, reduced food expenses, and enhanced environmental consciousness. It involves teaching individuals the knowledge and techniques required to successfully plan, plant, nurture, and harvest crops from their own garden for culinary and nutritional purposes.

5. **Dairy Farming and Milk Processing**: Gain knowledge about dairy cow management, milk processing, and value-added dairy products.

6. **Poultry Farming and Egg Production:** Learn about raising poultry, egg production, poultry health, and biosecurity practices.

7. **Agri-Entrepreneurship and Farm Management:** Develop skills in business planning, marketing, financial management, and agri-based entrepreneurship.

8. **Precision Agriculture and GIS Applications:** Learn about using technology, remote sensing, and Geographic Information Systems (GIS) in farming.

9. **Agri-Processing and Value Addition:** Explore post-harvest handling, food processing, packaging, and quality control for agri-products.

10. **Farm-to-Table Supply Chain Management**: Understand the entire supply chain from farm to consumer, including distribution, logistics, and marketing.

11. **Agri-Business Marketing and Branding:** Gain skills in marketing strategies, branding, digital marketing, and market research for agricultural products.

12. **Agricultural Export and Global Trade:** Learn about export regulations, quality standards, documentation, and international trade opportunities. It would also reflect on about financial planning, budgeting, loans, grants, and subsidies for agricultural enterprises.

B) Budget for Agro Based Skill Development Centre:

.	**Infrastructure Costs:**	
	Construction of Laboratories and Demonstration Areas	
	Equipment and Furniture:	
	Agricultural tools, machinery, and demonstration materials	
	Utility Setup	
	Computers and Software:	
	Audiovisual Equipment:	
B.	**Training and Curriculum Development:**	
	Training Materials and Resources:	
	Curriculum Development:	
	Training Modules and Workbooks:	
	Instructors and Trainers:	
	Total	

C) Expected Outcome

Training students for an agro-based skill center can have several positive outcomes, both for the students and for the agriculture sector. Here are some potential outcomes you can expect:

1. **Skill Development:**
   Students will acquire practical skills related to various aspects of agriculture, such as crop cultivation, livestock management, agribusiness, irrigation techniques, and sustainable farming practices.

2. **Employment Opportunities:**
   Graduates from the agro-based skill center will be better prepared to enter the agriculture workforce with specialized skills, increasing their chances of finding relevant employment.

3. **Entrepreneurship:**
   Some students may choose to start their own agricultural ventures, applying the skills and knowledge gained during their training. This can contribute to rural development and economic growth.

4. **Improved Agricultural Practices:**
   Trained students can implement modern and sustainable farming techniques, leading to increased agricultural productivity, reduced environmental impact, and enhanced food security.

5. **Technology Adoption:**
   Training can expose students to the use of technology in agriculture, such as precision farming tools, agricultural drones, and data analytics, enabling them to make informed decisions for efficient resource management.

6. **Increased Income Generation:**
   With enhanced skills, graduates can potentially earn higher incomes due to improved productivity and the ability to engage in value-added activities along the agricultural value chain.

7. **Rural Development:**

Trained students might choose to work in rural areas, contributing to the development of agriculture-dependent communities by introducing innovative practices and creating local employment opportunities.

8. **Sustainability Awareness:**
   Training can emphasize sustainable agricultural practices, encouraging students to adopt eco-friendly approaches that preserve natural resources and promote environmental stewardship.

9. **Research and Innovation:**
   Graduates could contribute to the agricultural sector through research and innovation, developing new techniques, crop varieties, or technologies that address challenges faced by farmers.

10. **Knowledge Sharing:**
    Trained individuals can become agricultural extension agents, sharing their expertise with local farmers and communities to disseminate modern farming practices.

11. **Industry Growth:**
    A skilled workforce can contribute to the growth and modernization of the agricultural industry, making it more competitive and responsive to market demands.

12. **Networking Opportunities:**
    Training programs often provide students with opportunities to connect with industry professionals, researchers, and fellow students, fostering a supportive network for future collaboration.

13. **Community Impact:**
    Graduates can have a positive impact on their communities by improving agricultural productivity, contributing to food security, and supporting local economic development.

14. **Lifelong Learning:**

The skills acquired through the agro-based skill center can serve as a foundation for continuous learning and adaptation to evolving agricultural practices and technologies.

It's important to design the training program in a way that aligns with the needs of the agriculture sector and the local community, ensuring that the outcomes are both relevant and impactful. Regular assessment and feedback from students and industry stakeholders can help refine the program and maximize its benefits.

Sonopant Dandekar Shikshan Mandali's

SONOPANT DANDEKAR ARTS, V.S. APTE COMMERCE AND M.H. MEHTA SCIENCE COLLEGE, PALGHAR

PRADHAN MANTRI UCHCHATAR SHIKSHA ABHIYAN (PM-USHA)

EXHIBIT-11

Details of Soft Component Activities

Navigating Innovation and Intellectual Property Rights: A Global Perspective

Prepared by : Internal Quality Assurance Cell

Theme: "Navigating Innovation and Intellectual Property Rights: A Global Perspective"

Introduction:

In the rapidly evolving landscape of technology, business, and creativity, Intellectual Property Rights (IPR) play a pivotal role in shaping the way innovations are protected, utilized, and shared. The International Conference on IPR invites scholars, practitioners, policymakers, and industry experts from around the world to engage in insightful discussions and thought-provoking exchanges on the intricate relationship between innovation and intellectual property.

Theme Explanation:

The conference theme, "Navigating Innovation and Intellectual Property Rights: A Global Perspective," centers on the dynamic interplay between cutting-edge advancements and the legal frameworks that safeguard and foster them. In an age of unprecedented connectivity and collaboration, this theme underscores the significance of international cooperation in shaping IPR policies that stimulate innovation while respecting creators' rights.

Key Focus Areas:

- Emerging Technologies and IPR: Delve into the challenges and opportunities posed by emerging technologies such as AI, blockchain, biotechnology, and more, and explore how IPR frameworks can adapt to accommodate these innovations.
- Cross-Border Collaboration: Examine the complexities of cross-border innovation, trade, and enforcement of IPR, and discuss strategies for harmonizing global IPR standards to facilitate collaboration while ensuring fair compensation.
- Start-ups and IPR Ecosystem: Explore how startups and small businesses can navigate the IPR landscape to protect their inventions and creations, foster innovation, and attract investment.
- Digital Age and Copyright: Analyse the evolving landscape of digital content creation, distribution, and consumption, and its implications on copyright law, fair use, and digital rights management.
- Ethics and IPR: Discuss the ethical dimensions of intellectual property, including open access, cultural heritage, indigenous knowledge, and the balance between IP protection and public interest.

- IPR Enforcement and Litigation: Examine effective enforcement mechanisms, dispute resolution strategies, and the role of courts and international organizations in upholding IPR rights.
- Innovation Policy and Public Interest: Deliberate on the role of IPR policies in promoting innovation, economic growth, and societal welfare, while ensuring that public interest concerns are addressed.

Conference Objectives:

- Foster interdisciplinary dialogue among scholars, legal experts, industry leaders, and policymakers to gain comprehensive insights into the evolving IPR landscape.
- Facilitate knowledge exchange on best practices, case studies, and innovative approaches in IPR protection, management, and enforcement.
- Provide a platform for researchers to showcase their latest findings in the realm of intellectual property and innovation.
- Explore the impact of IPR on various sectors, including technology, healthcare, arts, and agriculture, and its influence on global economic dynamics.
- Strengthen international cooperation and collaboration among stakeholders for the advancement of IPR frameworks that stimulate creativity and technological progress.

The target audience for this theme includes:

1. **Academics and Researchers:** Scholars and researchers in the fields of law, intellectual property, innovation, technology, business, economics, and related disciplines who are interested in exploring the intersection of innovation and IP rights.

2. **Legal Professionals:** Lawyers, legal consultants, and intellectual property experts who deal with issues related to patent law, copyright law, trademark law, and other aspects of intellectual property rights.

3. **Industry Leaders and Entrepreneurs:** CEOs, business owners, startup founders, and industry leaders who want to understand how to protect their innovations, navigate IPR regulations, and leverage IP assets for business growth.

4. **Government Officials and Policymakers:** Representatives from government agencies responsible for shaping intellectual property policies, trade, and innovation strategies, seeking insights into global IPR trends and best practices.

5. **Technology and Innovation Professionals:** Professionals involved in research and development, technology transfer, innovation management, and commercialization who want to explore how IPR impacts their work.

6. **Academic Institutions:** University administrators, professors, and technology transfer officers interested in promoting innovation, supporting research, and understanding the legal aspects of intellectual property in academia.

7. **Startups and Small Businesses:** Entrepreneurs, innovators, and small business owners looking to learn how to protect their intellectual property, navigate licensing agreements, and manage IP-related challenges.

8. **International Organizations:** Representatives from international organizations focused on intellectual property rights, trade, and economic development, seeking insights into global trends and opportunities for collaboration.

9. **NGOs and Advocacy Groups:** Organizations advocating for open access, public interest, and equitable distribution of knowledge, interested in discussing the ethical dimensions of IPR.

10. **Investors and Venture Capitalists:** Investors looking to understand how intellectual property can affect investment decisions, valuation of startups, and the overall innovation ecosystem.

11. **Creative Professionals:** Artists, writers, musicians, filmmakers, and other creative individuals interested in understanding how intellectual property rights impact their ability to protect and monetize their creations.

12. **Educational Institutions:** Educators, educational administrators, and curriculum designers aiming to incorporate discussions on IPR and innovation into educational programs.

The conference's multidisciplinary approach and global perspective make it appealing to a wide range of participants who are eager to engage in meaningful discussions about the intricate relationship between innovation and intellectual property rights on a global scale.

Sonopant Dandekar Shikshan Mandali's

SONOPANT DANDEKAR ARTS, V.S. APTE COMMERCE AND M.H. MEHTA SCIENCE COLLEGE, PALGHAR

PRADHAN MANTRI UCHCHATAR SHIKSHA ABHIYAN (PM-USHA)

EXHIBIT-12

LINKAGES

FUNCTIONING MOU WITH FOLLOWING INDUSTRIES AND ORGANIZATIONS

Prepared by : Internal Quality Assurance Cell

FUNCTIONING MOU WITH FOLLOWING INDUSTRIES AND ORGANIZATIONS

Sr. No.	Title of the Linkage	Name of the partnering/institution/industry/research lab with contact details
1	On – Job Training, Placement, Visits	Kokuyo Camlin Ltd., Tarapur
		H. R. Manager – Mr. Ajit Rane – 8308288188
2	On – Job Training, Placement, Visits	Jindal Steel Works Ltd. (JSW) Tarapur
		H. R. Manager – Mr. Baban Jadhav, 9970390600
3	On – Job Training, Placement, Visits	Viraj Steel, Tarapur
4	On – Job Training, Placement, Visits & Diploma in Pharmaceutical Chemistry	Lupin Ltd.- Mr. Mahesh Kate, 9082045429
5	Short term course on Patent Agent and Patent Analyist	Innove Intellect, Gaziabad – Puja 9910657125
6	GTTF is engaged in the field of education & amp; employability domain to design & amp; implement courses that help raise the economic productivity of the underserved.	GTT Foundation - Pravin Pawar, 9657047273

Sonopant Dandekar Shikshan Mandali's

SONOPANT DANDEKAR ARTS, V.S. APTE COMMERCE AND M.H. MEHTA SCIENCE COLLEGE, PALGHAR

PRADHAN MANTRI UCHCHATAR SHIKSHA ABHIYAN (PM-USHA)

EXHIBIT-13

TIMELINE FOR COMPLETION OF PROJECT

Prepared by : Internal Quality Assurance Cell

LIST OF EQUIPMENTS (YEAR 1: 2023-24)

A.	**Upgrading Traditional Classrooms to Smart Classrooms**	**Quantity**	**Cost per Unit**	**Total Cost**
1.	Interactive panels Android	12	2,50,000	30,00,000
2.	Ahuja Small Speaker	20	3,600	72,000
	Total			**30,72,000**
B.	**Setting up Nodal Digital Centre for the Development of MOOC and Online programs.**	**Quantity**	**Cost per Unit**	**Total Cost**
	Server	2	545000	1090000
	RAM	6	17000	102000
	SSD (1TB)	2	9500	19000
	Win Server 2019 Windows License edition	2	24650	49300
	NAS Box (4 TB)	2	45676	91352
	Online UPS (APC SRV5KRIL-IN 5000 VA Sine Wave UPS)	2	139990	279980
	Personal Computers for Office	30	58990	1769700
	Individual UPS for Personal Computers	30	3000	90000
	Manageable Switch	4	25999	103996
	Firewall FortGate	2	85000	170000
	AC for Server Room (1.5 Ton)	2	42500	85000
	MS-Office 2021 STD License	2	23600	47200
	Networking Rack	2	12500	25000
	CAT-6 Network Cable	4	8000	32000
	NET GEAR WIFI ROUTER	12	7499	89988
	CAL License for Server	30	750	22500

	Total			**40,67,016**
C	**Department of Zoology**	**Quantity**	**Cost per Unit**	**Total Cost**
1	UV-Vis Spectrometer	1	500000	500000
2	Microscope with LCD screen	1	100000	100000
3	Gel Doc. System	1	400000	400000
4	Horizontal electrophoresis	1	20000	20000
5	Vertical electrophoresis	1	15000	15000
6	Sonicator	1	250000	250000
7	PCR Thermal Cycler	1	500000	500000
8	Semi-Automatic Microtome	1	300000	300000
9	Cooling Centrifuge	1	300000	300000
	Total			**2385000**
D	**Department of Physics**	**Quantity**	**Cost per Unit**	**Total Cost**
1	Tubular Furnace	1	160000	160000
2	One channel Potentiostat	1	450000	450000
3	Magnetic Stirrer with heating	1	20000	20000
4	Centrifuge Machine	1	50000	50000
5	Hot air oven(1000°C)	1	40000	40000
6	Xenon Lamp(1000W)	1	80000	80000
7	Solar Simulator	1	300000	300000
8	Autoclave supercritical system(1 Litre)	1	340000	340000
9	Ultrasonic sonication bath	1	43324	43324
10	Weighing Scale Machine(0.01mg)	1	70000	70000

	TOTAL			**1553324**
E	**Department of Botany**	**Quantity**	**Cost per Unit**	**Total Cost**
1	Microscope with Camera attachment	2	1,50,000	3,00,000
2	Colorimeter	1	6800	6800
3	Compound Light Microscope	1	8050	8050
4	Hot Air Oven	1	16000	16000
5	pH Meter	1	7500	7500
6	Turbidity Meter	1	9400	9400
7	Conductivity meter	1	7750	7750
8	Weighing Balance	1	53324	53324
9	Centrifuge Machine	1	9000	9000
	TOTAL			**4,17,824**

LIST OF EQUIPMENTS (YEAR 2: 2024-25)

E	**Department of Biotechnology**	**Quantity**	**Cost per Unit**	**Total Cost**
1	HPLC	1	1800000	1800000
2	PCR	1	150000	150000
3	FTIR	1	1500000	1500000
4	Elisa reader with kit and accessories	1	5,00,000	500000
5	GC-MS	1	4500000	4500000
6	Flame photometer	1	326600	326600
7	Cooling Centrifuges PLUS, Capacity: 1200 Ml, RPM- 20,000	1	400000	400000
8	Anaerobic Rotary shaker with temperature control	1	1750000	1750000
9	Atomic Absorption spectroscopy	1	1210000	1210000
10	Double beam UV spectrophotometer	1	550000	550000
11	Vertical Laminar Airflow Unit	1	700000	700000

12	Bio Safety Cabinet	1	385000	385000
	TOTAL			**13771600**

LIST OF EQUIPMENTS (YEAR 3: 2025-26)

E	Department of Chemistry	Quantity	Cost per Unit	Total Cost
1	**GC** (Gas Chromatography)	1	3540000	3540000
2	**Rotavapour**	1	826000	826000
3	**FTIR** (FT- Infra Red Spectrophotometer)	1	1500000	1500000
4	Nanodrop Spectrophotometer	1	691480	691480
5	Fumehood	1	250000	250000
6	Oil Free Vaccum Pump	1	250000	250000
7	Microwave Distillation Assembly	1	250000	250000
8	**LC-MS (Liquid Chromatography- Mass Spectrophotometer)**	1	7345000	7345000
	Total			**14652480**

Sonopant Dandekar Shikshan Mandali's

SONOPANT DANDEKAR ARTS, V.S. APTE COMMERCE AND M.H. MEHTA SCIENCE COLLEGE, PALGHAR

PRADHAN MANTRI UCHCHATAR SHIKSHA ABHIYAN (PM-USHA)

AWARDS & RECOGNITIONS

Prepared by : Internal Quality Assurance Cell

AWARDS

Times Groups Award for Social Awareness, 12th December, 2017

The prestigious **"Samajik Bhan Puraskar"** given by Times Group was awarded this year to Sonopant Dandekar College for its commitment to cleanliness drive at public places. The award was received by Principal Dr. Kiran Save and NSS Program Officer Assi. Prof. Vivek Kudu from the auspicious hands of Dr. Suhas Pednekar, Principal Ruia College, Mumbai and newly appointed Vice Chancellor of Mumbai University.

Mumbai University - Best College Award -2016-17, 26th January, 2018

The prestigious award for "**Best College" of rural area of University of Mumbai** for the year 2016-17 was declared to Sonopant Dandekar College. This award was accepted by President of Sonopant Dandekar Shikshan Mandali Adv. G. D. Tiwari, Secretary Prof. Ashok Thakur, Trustee Shri. R. M. Patil, Principal Dr. Kiran Save and Asso. Prof. Tanaji Pol at the hands of Hon. Vice Chancellor Dr. Devanand Shinde at University of Mumbai, Fort Campus.

SONOPANT DANDEKAR ARTS, V.S. APTE COMMERCE AND M. H. MEHTA SCIENCE COLLEGE, PALGHAR

Dr. S. D. Vartak Lifetime Achievement Award Ceremony, 17th December, 2017

A prestigious Dr. S. D. Vartak Jeean Gaurav Purskar was awarded to Sonopant Dandekar Shikshan Mandali for its valuable contribution for the upliftment of the poor, needy aadivasi community, especially women folk through education. The award was received by Adv. G. D. Tiwari, president, Sonopant Dandekar Shikshan Mandali and Trustees Shri. Navneetbhai Shah, Smt. Manaktai Patil, Shri. Lala Bajpai at the hands of Dr. Vasudha Kamat, Ex-vice chancellor of SNDT Women University and member of National Educational Policy Committee. Treasurer Shri. Hitendra Shah, Secretary Prof. Ashok Thakur, Joint Secretary Shri. Jayant Dandekar, Principal Dr. Kiran Save, Administrative Supervisor of Senior College Assi. Prof. Mahesh Deshmukh, teaching staff and students were present for the function.

Sonopant Dandekar Shikshan Mandali's

SONOPANT DANDEKAR ARTS, V.S. APTE COMMERCE AND M. H. MEHTA SCIENCE COLLEGE, PALGHAR

India Today (Times Group) All India Annual Educational Institutional Survey (Arts College : 82 & Science College : 90)

SONOPANT DANDEKAR SHIKSHAN MANDALI'S

SONOPANT DANDEKAR ARTS, V. S. APTE COMMERCE & M. H. MEHTA SCIENCE COLLEGE

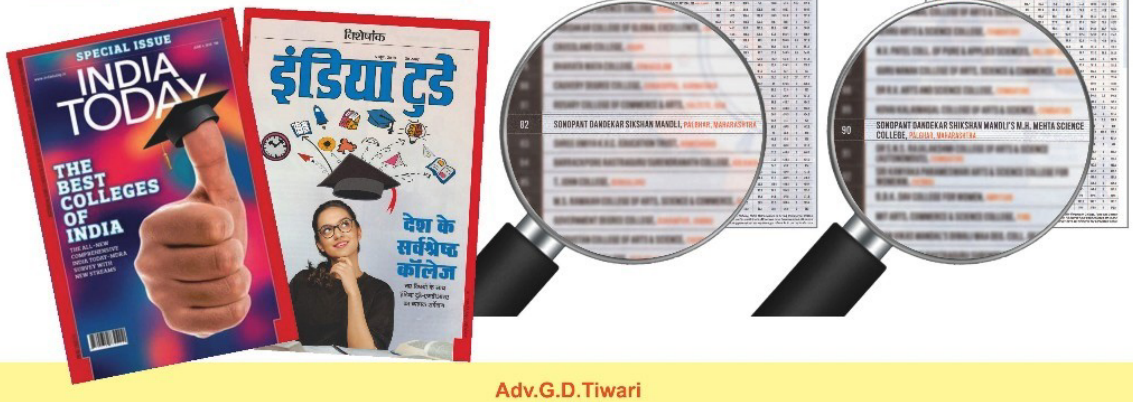
CONGRATULATIONS

We are Best in Palghar...
We are Best in University of Mumbai...
and Now

We are amongest the BEST 100 COLLEGES IN INDIA

BEST COLLEGES

INDIA TODAY GROUP–MDRA SURVEY, 2018



Adv.G.D.Tiwari
President

Dr.Kiran Save	Shri. Chandrakant Dandekar	Shri. Sunil Chitre	Prof. Ashok Thakur	Shri. Atul Dandekar	Shri. Jayant Dandekar	Shri. Hitendra Shah
Principal	Vice-President	Vice-President	Secretary	Secretary	Joint-Secretary	Treasurer

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BEST COLLEGES 2023 — ARTS

WEST

ZONAL RANK	NAME OF INSTITUTE	CITY
29	SONOPANT DANDEKAR ARTS, VS APTE COMMERCE AND MH MEHTA SCIENCE COLLEGE	PALGHAR

BEST COLLEGES 2023 — COMMERCE

WEST

ZONAL RANK	NAME OF INSTITUTE	CITY
38	SONOPANT DANDEKAR SHIKSHAN MANDALI'S SONOPANT DANDEKAR ARTS, VS APTE COMMERCE AND MH MEHTA SCIENCE COLLEGE	PALGHAR

Adv. G. D. Tiwari
President
Sonopant Dandekar Shikshan Mandali

Dr. Kiran Save
Principal
Sonopant Dandekar College

Sr. No.	Awards	Date
1	Sonopant Dandekar College received **Overall Championship (First Rank) for Zone IV Palghar District** in the 16th Inter-Collegiate/ Institute/ Department Avishkar Research Convention organized on Virtual Platform by Department of Students Development, University of Mumbai for the academic year 2021-22.	31/05/2022
2	Sonopant Dandekar College received **Overall Championship (First Rank) in Agricultural and Animal Husbandry Category** in the 16th Inter-Collegiate/ Institute/ Department Avishkar Research Convention organized on virtual platform by Department of Students Development, University of Mumbai for the academic year 2021-22.	31/05/2022

3	Sonopant Dandekar College received **Overall Second Runner Championship (Third Rank)** in the 16th Inter-Collegiate/ Institute/ Department Avishkar Research Convention organized on virtual platform by Department of Students Development, University of Mumbai for the academic year 2021-22.	31/05/2022
4	Sonopant Dandekar College received **Overall Championship (First Rank) for Fine Art Section** in the 54th Inter-Collegiate/ Institute/ Department Cultural Youth Festival organized on Virtual Platform by Department of Students Development, University of Mumbai for the academic year 2021-22.	30/04/2022
5	Amongst the **Top best colleges in India as India Today Group – MDRA Survey – 2022** (Arts College : 124th Position, Commerce College – 148th Position & Science College 152nd Position)	
6	**Top Best College in India as per Outlook – ICARE Ranking – 2022**. (Arts College – 99th Position & Commerce College – 122nd Position)	11/07/2022
7	**College Annual Magazine Spandan awarded Best Magazine** by Yashwanrao Chavan Center, Mumbai	06/09/2022
8	**Dr. Kiran Jaydeo Save awarded 'Best Teacher Award'** for Rural area for the Academic year 2019-2020 by University of Mumbai	05/09/2022