



Shreeshakti Shaikshanik Sanstha's

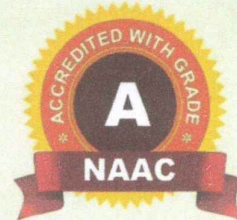
DIVINE COLLEGE OF PHARMACY

Nampur Road, Satana, Tal. Baglan, Dist. Nashik-423301 (M.S.)

Phone: (02555) 226009

E-mail: divinecop15@gmail.com

Web: www.divinepharmacy.in



Approved by PCI - New Delhi (531), Govt. of Maharashtra & DTE - Mumbai (5443).

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7.2.1 Best Practices:

Sr. No.	Title	Page No.
Best Practice 1: Framework for effective knowledge transfer		
1	Preparation of Teaching plan by faculty members.	3
2	Daily record of teaching	3
3	Monthly submission of completion report	4-5
4	The record of books/ papers/ articles published by faculty semester wise	6-8
5	Record of seminars/ workshop attended by staff semester to semester	9-14
6	Use of PowerPoint presentation for effective knowledge transfer	15-17
7	Educational YouTube Channel Run by staff	18
8	Use of LCD projector, Interactive board, LCD TV	19-20
9	Question Bank Sample	21-51
10	Academic Feedback from Students	52-54
Best Practice 2: Green Initiative		
11	Well-developed Medicinal Garden	55
12	Plastic free campus sign boards	56
13	Certificates from various agencies	57-59
14	Use of LED based lights, power efficient instruments in the College Campus for Energy Conservation	60-61
15	Use of Bicycles	62
16	Management of various types of waste	63
17	Use of Dustbins in the campus premises	64-65
18	Vermicompost Plant for Bio-Degradable Waste	66
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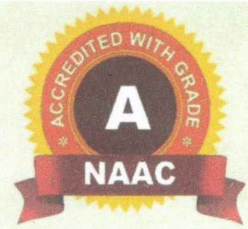
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20	Mega Tree Plantation Drive	69
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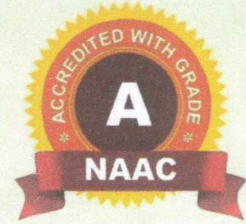
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Best Practice 1: Framework for effective knowledge transfer

1. Preparation of Teaching plan by faculty members:

Proposed Planning

Name of the Institute: Divine College of Pharmacy, Satana
 Institute Code No.: 5443
 Name of the Program: B Pharmacy
 Semester: SEM II (Second Year)
 Academic Year: 2023-24

Name of the course: Physical Pharmaceutics I
 Course code: BP302T | Course Index: | Course Credit: 4
 Name of faculty: Shriraj Jadhav
 Probable / Actual Hrs Available: 45.00 Hrs
 Number of lectures : 45

Lecture No.	Date	Time	Duration	Syllabus to be covered	Course Outcome	Unit Outcome	Comment	Teaching Methodology	Pre Reading Material	Reference Book
1	04th September, 2023	01:00 PM - 02:00 PM	1 hour	Solubility expressions.	BP302T 1, BP302T 4			Powerpoint Presentation Chalk Piece Question and Answer		
2	05th September, 2023	02:00 PM - 03:00 PM	1 hour	Solubility expressions.	BP302T 1, BP302T 4			Powerpoint Presentation Discussion		
3	06th September, 2023	02:00 PM - 03:00 PM	1 hour	Mechanisms of solute solvent interactions.	BP302T 1, BP302T 4			Powerpoint Presentation Chalk Piece		
4	11th September, 2023	01:00 PM - 02:00 PM	1 hour	Ideal solubility parameters.	BP302T 1, BP302T 4			Powerpoint Presentation Chalk Piece		
5	12th September, 2023	02:00 PM - 03:00 PM	1 hour	Solution & association. quantitative approach to the factors influencing solubility of drugs.	BP302T 1, BP302T 2, BP302T 4, BP302T 5			Powerpoint Presentation Chalk Piece		

2. Staff keep daily record of teaching related activities

Divine COP

Academic Planning | Course List | Course Dashboard | Session List

Session List 2023-24 B Pharmacy | SEM II | Physical Pharmaceutics I (Theory - regular)

Completed 45 Pending 0 Cancelled 0 Total 45

Sr.No	Type	Date & Time	Proposed Topic & Syllabus	Completion Topic & Syllabus	Completion Date	Content Beyond syllabus	Teaching Methodologies	Attendance	Status	Owner	Unit Outcome	Course Outcome	Transfer	Action
1	Regular	04th September, 2023 01:00 PM - 02:00 PM	Solubility expressions.	+ Solubility expressions.	04th Sep, 2023 01:00 PM - 02:00 PM		Powerpoint Presentation Chalk...	57 / 78	Completed	Shriraj Jadhav		BP302T 1, BP302T 4		☑
2	Regular	05th September, 2023 02:00 PM - 03:00 PM	Solubility expressions, Mechanisms of solute solvent	+ Mechanisms of solute solvent	04th Sep, 2023 04:00 PM - 05:00 PM		Powerpoint Presentation Discu...	69 / 78	Completed	Shriraj Jadhav		BP302T 1, BP302T 4		☑
3	Regular	06th September, 2023 02:00 PM - 03:00 PM	Mechanisms of solute solvent - ideal solubility parameters.	+ Solution & association, quan	06th Sep, 2023 02:00 PM - 03:00 PM		Powerpoint Presentation Chalk...	70 / 78	Completed	Shriraj Jadhav		BP302T 1, BP302T 4		☑
4	Regular	11th September, 2023 01:00 PM - 02:00 PM	Ideal solubility parameters, Solution & association, quan.	+ Solution & association, quan	11th Sep, 2023 01:00 PM - 02:00 PM		Powerpoint Presentation Chalk...	61 / 78	Completed	Shriraj Jadhav		BP302T 1, BP302T 2, BP302T 4, BP302T 5		☑
5	Regular	12th September, 2023	Solution &	+ Diffusion	12th Sep, 2023		Powerpoint Presentation Chalk...	72 / 78	Completed	Shriraj Jadhav		BP302T 1, BP302T 2, BP302T 4, BP302T 5		☑



Shriraj Jadhav
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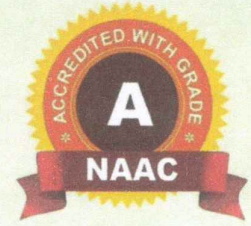
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3. Monthly submission of completion report by staff with Signature of Academic Incharge and Principal

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Date - 02/03/2024

MONTHLY REPORT Month - Feb 2024

Name of Staff		Mr. Vijayraj N. Sawane				
Academic activities and details						
Class	Subject code	Subject	Theory	Practical	Prescribed Lecture/Practical	Conducted Lecture/Practical
Third year B.Pharm	BS06T	Pharmaceutical Quality Assurance	<input type="checkbox"/>	<input type="checkbox"/>	11	07
F.Y. M.Pharm	MQA202T	Pharmaceutical validation	<input type="checkbox"/>	<input type="checkbox"/>	-	-
Final year B.Pharm		Project Work	<input type="checkbox"/>	<input type="checkbox"/>	-	-
-		-	<input type="checkbox"/>	<input type="checkbox"/>	-	-
Tutorial activities						
Subject						
PQA	Questions were assigned for tutorials and data were collected					
-	-					
-	-					
Academic activities:						
1. Regular lectures were conducted as per						
2. schedule						
3.						
Exam activities:						
1. Supervision of sessional exam						
2. Question paper preparation for T.Y. B.Pharm & F.Y. M.Pharm						
3. Assessment of answer sheets						
4. Updation of internal exam register.						



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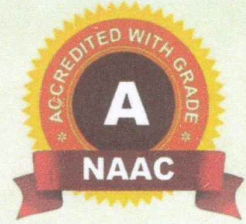
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Portfolio and Personal details/ Participation
Role and Responsibilities: 1. Academic incharge: Activities of academics were monitored 2. regularly. Corrective action were taken to improve the 3. attendance of final year.
Paper/Book Publication: 1. "formulation & evaluation of herbal oil" - Research 2. article published in Open access journal of pharmaceutical 3. research.
Workshop/ Seminar / Conferences attended 1. International e-conference on "Global career opportunities 2. for pharmacy students" 3.
Participation/ Role in Extracurricular and Cultural activities: 1. Involved in annual function and days celebration. 2. 3.
NAAC activities (Mention the criteria wise activities): 1. Swayam course completed - Ethics review of health research 2. Criterion II : Swayam courses by students, CO, PO updation 3. in vsm edulife software
Leave Record CL: 01 (Leave Balanced= 11) DL: ML: C-off:
If other specific role, specify here: 1. final certificate of Design Patent received on 5/02/24 2. 3.
Other Details (If any)

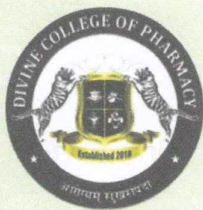
Name and Sign of Staff
V.N. Sonaware

Academic In-charge

Principal



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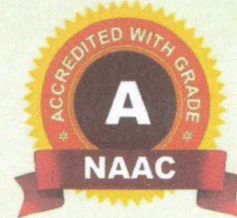
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4. Keeping the record of books/ papers/ articles published by faculty:

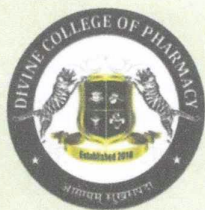
Sr. No	Title of paper	Name of the author/s	Department of the teacher	Name of Journal	Year of publication	ISSN number	Indexing UGC
1	<u>Survey Based Assessment of Adverse Effect in Covid-19 Vaccination Breakthrough Infections</u>	Jubershaha Fakir, Khemchand R. Surana, Dhananjay M Patil, Deepak D Sonawane	Pharmacology	Asian Journal of Research in Pharmaceutica I Sciences	2023-24	2231-5659 2231-5640	Peer Reviewed
2	Development and Validation of Simple UV-Spectrophotometric Method for Estimation of Diclofenac Sodium	Chaitali A. Yeola, Vaishali N. Sonawane, Vijayraj N. Sonawane, Khemchand R. Surana, Dhananjay M. Patil, Deepak D. Sonawane	Pharmaceutica I Chemistry	Asian Journal of Pharmaceutica I Analysis	2023-24	2231-5675 (Online) 2231-5667 (Print)	Peer Reviewed
3	Estimation of Paracetamol in various brands of Paracetamol Tablets and their Comparative Study	Vaishali N. Sonawane, Chaitali A. Yeola, Vijayraj N. Sonawane, Khemchand R. Surana, Dhananjay M. Patil, Deepak D. Sonawane	Pharmaceutica I Chemistry	Asian Journal of Pharmaceutica I Analysis	2023-24	2231-5675 (Online) 2231-5667 (Print)	Peer Reviewed
4	Possible Reactions on Coumarin Molecule	Suvarna S Bahiram, Santosh R. Tambe, Swati Hatagale, SK Mahajan, Khemchand R Surana	Pharmaceutica I Chemistry	Journal of Advanced Scientific Research	2023-24	0976-9595	UGC



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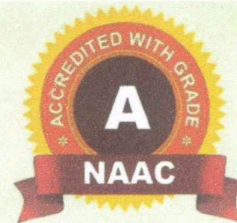
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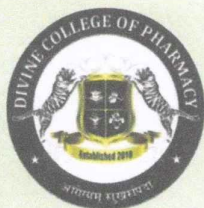
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5	In vitro Antimicrobial and Antifungal Activity of Mentha piperita Active Phytoconstituents	SHITAL J. PATIL, KHEMCHAND R. SURANA and SUNIL K. MAHAJAN	Pharmaceutica I Chemistry	Research Journal of Agricultural Sciences	2023-24	0976-1675	UGC
6	A Review On Computer-Aided Drug Design And Discovery	Sushant M. Ahire, Shivraj P. Jadhav , Vijay V. Shewale, Prerana S. Pawar, Aditi M. Kokande, Dhanashree P. Sonawane, Dhananjay M Patil	Pharmaceutica I Chemistry	Journal for Re Attach Therapy and Developmenta I Diversities	2023-24	2589-7799	Scopus
7	Quantification of Active Phytoconstituents in Ethanolic Extract of Mentha piperita by Modern Analytical Tools	Shital J. Patil, Khemchand R. Surana and Sunil K. Mahajan	Pharmaceutica I Chemistry	Research Journal of Agricultural Sciences	2023-24	0976-1675	UGC
8	Exploring The Therapeutic Potential of Rubia cordifolia: Extraction, Phytochemical Evaluation and Microbiological Perspectives	Vijayraj N. Sonawane, Amjadkhan Pathan, Deepak D. Sonawane	Pharmaceutica I Chemistry	Advances in Bioresearch	2023-24	E-ISSN : 2277-1573 P-ISSN : 0976-4585	Web of Science




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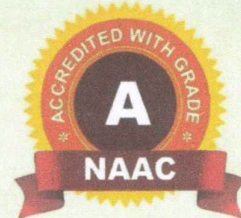
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9	A Comprehensive Study on Zinc Oxide Nanoparticles: Synthesis, Characterization, Evaluation and Microbiological Insights	Vijayraj N. Sonawane, Amjadhkan Pathan, Deepak D. Sonawane	Pharmaceutica I Chemistry	International Journal of Zoological Investigations	2023-24	2454-3055	Web of Science
10	A Systematic Review on Remdesivir for Preventing Covid 19	Indrakumar K. Sonawane, Khemchand R. Surana , Deepak D. Sonawane, Yogesh P. Sharma, Dhananjay M. Patil	Pharmaceutica I Chemistry	Advances in Bioresearch	2023-24	2277-1573 0976-4585	January 2024 Web of Science



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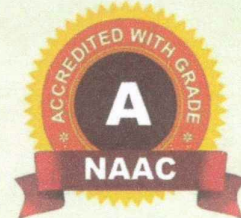
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Khemchand R. Surana	26-08-2023	Webinar	1	One Day National Webinar on Futuristic Innovations in Pharmaceutical Arena
Jadhav Shivraj Popat	26-08-2023	Webinar	1	Futuristic Innovations in Pharmaceutical Arena
Jadhav Shivraj Popat	27-08-2023	Webinar	1	Quality Cosmetics Role of evolving technologies and regulations
Jadhav Shivraj Popat	30-08-2023	Conference	3	Regulation of E pharmacy In India
POL MAYURI PAPALAL	07-08-2023	FDP	07	Initiatives for Fostering Quality Higher Education in India in the 21th Century
Chaudhari Yashwant Shantaram	30-07-2023	Workshop	3	Online "Three Days International Workshop On Research Methodology For Faculties and Research Scholar"
Chaudhari Yashwant Shantaram	13-08-2023	Conference	1	The National Conference On Multidisciplinary Research in Library and Information Science
Chaudhari Yashwant Shantaram	11-07-2023	Webinar	1	State Level Webinar on "World Population Day"
Chaudhari Yashwant Shantaram	31-08-2023	Training Program	31	'National Education Policy 2020: Professional Development Programme'
Chaudhari Yashwant Shantaram	31-08-2023	Webinar	1	"Different Dimensions of Personality Development"
CHAUDHARI YASHWANT SHANTARAM	07-05-2023	Conference	1	One day Online Conference on "National Conference on Multidisciplinary Research In Library and Information Science"
Khemchand R. Surana	08-10-2023	Webinar	1	IPR IN THE ERA OF DIGITAL TRANSFORMATION
Khemchand R. Surana	09-09-2023	Symposium	1	Online Symposium On " Role of Artificial Intelligence in Diagnosis of Disease and Drug Development ."
Khemchand Surana	16-09-2023	Training Program	1	Antifungals: Pharmacokinetics and Pharmacodynamics




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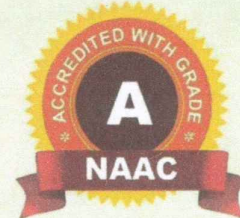
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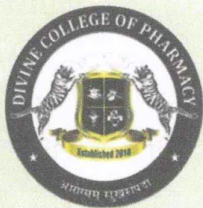
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Khemchand R. Surana	17-12-2023	Webinar	0	Strategic approach to Research Mistry: Drug Discovery from herbal source with advanced instrumentation
Khemchand R. Surana	19-12-2023	Webinar	1	Cancer Drug Discovery : A Molecular Journey to targeted treatment
Khemchand R. Surana	24-09-2023	Webinar	1	Pharmacist Proactive Positive player in rational therapeutic
Surana Khemchand Rajendra	25-11-2023	Webinar	1	Elementary principles of Pharmaceutical Research and Technology for Budding Pharmacist
Surana Khemchand Rajendra	28-10-2023	Webinar	1	Emerging Trends in Co-Processed excipients and architecting dosage form
Khemchand R. Surana	29-09-2023	Workshop	1	One Day Online National Level Workshop Cum FDP on "Emerging Trends in Instrumentation and Application of HPTLC in Drug Discovery"
Khemchand R. Surana	29-10-2023	Webinar	1	Attaining intelligence to move towards artificial intelligence: Pharma Prospective
Khemchand R. Surana	30-09-2023	Training Program	30	2Credit SWAYAM Course 'National Education Policy2020: Professional Development Programme'
CHAUDHARI YASHWANT SHANTARAM	31-12-2023	Training Program	180	ACTIVE SPOC FOR THE SWAYAM NPTEL LOCAL CHAPTER
Ahire Sushant Mothabhau	24-12-2023	Webinar	1	" Emerging trends in Pharmacovigilance and Clinical Trails"
Sushant M. Ahire	29-09-2023	FDP	1	"Emerging Trends in Instrumentation and Application of HPTLC in Drug Discovery"
Sushant M. Ahire	31-10-2023	Training Program	30	2Credit SWAYAM Course 'National Education Policy2020'
Sushant M. Ahire	25-08-2023	Training Program	1	GOOD CLINICAL PRACTICE



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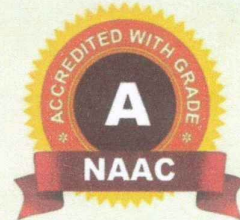
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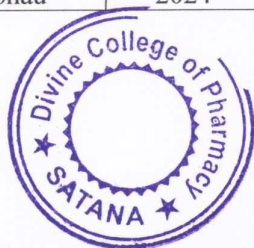
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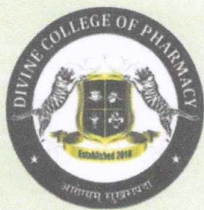
Sushant M. Ahire	29-12-2023	Webinar	1	"Importance of intellectual property rights in education sector"
Sushant M. Ahire	15-09-2023	Webinar	1	"Integrated Microfluidic Bio Chips, Polymer Design for Drug Delivery & Organic Synthesis"
Abdul Kalam	07-08-2023	FDP	8	Initiatives for Forcasting Quality Higher Education in India the 21th Century
Abdul Kalam	15-07-2023	Conference	1	National Conference on "Intelligent Automation in Pharmaceutical Industry"
Patil Chandrashekhar Dinkar	31-07-2023	FDP	30	National Education Policy 2020
Ahire Sushant Mothabhau	15-07-2023	Conference	1	"Intelligent Automation in Pharmaceutical Industry"
Ahire Sushant Mothabhau	29-09-2023	Workshop	1	"Emerging Trends in Instrumentation and Application of HPTLC in Drug Discovery"
Ahire Sushant Mothabhau	25-08-2023	Lecture Series	3	NIDA
Ahire Sushant Mothabhau	24-12-2023	Webinar	1	Emerging trends in pharmacovigilance and clinical trials
Ahire Sushant Mothabhau	31-10-2023	Training Program	30	'National Education Policy 2020: Professional Development Programme'
Ahire Sushant Mothabhau	15-09-2023	Webinar	1	Integrated Microfluidic Bio Chips, Polymer Design for Drug Delivery & Organic Synthesis"
Ahire Sushant Mothabhau	27-01-2024	Webinar	1	synergizing Excellence: Integrating research methodology with Advanced drug delivery systems
Ahire Sushant Mothabhau	12-01-2024	FDP	6	Recent trends in medical technology innovation and pharmaceuticals
Ahire Sushant Mothabhau	03-02-2024	FDP	6	Empowering Academia: Crafting Research, Review Articles and Funded Project
Ahire Sushant Mothabhau	17-02-2024	Conference	1	"Global Career Opportunities for Pharmacy Students"



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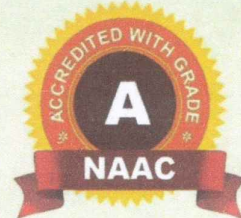
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Ahire Sushant Mothabhau	02-02-2024	Webinar	1	"IC Design for Different Applications & Environmental & Biomedical Technologies"
Ahire Sushant Mothabhau	23-03-2024	Lecture Series	01	Decentralized Clinical trials and career scope in UK
Ahire Sushant Mothabhau	16-03-2024	FDP	6	"Recent Advancements in Pharmaceuticals: Academic, Research, Ethics, and Social Perspective"
Ahire Sushant Mothabhau	30-03-2024	Training Program	30	NleCer 103: Scientific Writing in Health Research
Ahire Sushant Mothabhau	30-04-2024	Training Program	15	"NEP 2020 Orientation and Sensitization Programme"
Ahire Sushant Mothabhau	27-04-2024	Webinar	1	Fundamentals of pharmaceutical technology and research for aspiring pharmacists
Ahire Sushant Mothabhau	30-05-2024	Workshop	02	"PHARMACEUTICAL RESEARCH METHODOLOGY IN THE MODERN ERA"
Ahire Sushant mothabhau	15-06-2024	Webinar	01	"The Future of Clinical Trials: Integrating AI and Machine Learning"
Sonawane Vijayraj Narendra	22-04-2024	Conference	1	Pharmacovigilance
Patil Chandrashekhar Dinkar	16-04-2024	Conference	1	Role of AI in Revolutionizing Pharmaceutical Research and Biomedical Sciences
Sonawane Vijayraj Narendra	26-04-2024	Training Program	9	NEP 2020 Orientation and Sensitization Programme
Patil Chandrashekhar Dinkar	30-03-2024	Training Program	15	Online Certification on Ethics Review of Health Research
Sonawane Vijayraj Narendra	27-04-2024	Webinar	1	Fundamentals of Pharmaceutical Technology and Research for Aspiring Pharmacists
Patil Chandrashekhar Dinkar	17-03-2024	Training Program	7	NleCer 103: Scientific Writing in Health Research
Sonawane Vijayraj Narendra	17-02-2024	Conference	1	International e-Conference on "Global Career Opportunities for Pharmacy Students"



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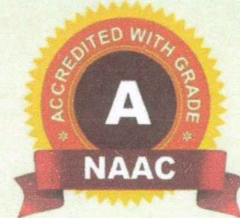
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Sonawane Vijayraj Narendra	22-12- 2023	Webinar	1	“Intellectual Property Rights: Challenges, Risks, and Solutions”
Sonawane Vijayraj Narendra	30-09- 2023	Training Program	30	‘National Education Policy2020: Professional Development Programme’
Sonawane Vijayraj Narendra	15-07- 2023	Conference	1	“Intelligent Automation in Pharmaceutical Industry”
Sonawane Vijayraj Narendra	25-11- 2023	Webinar	1	Elementary Principle of Pharmaceutical Research and technology for Budding Pharmacists
Sonawane Vijayraj Narendra	26-08- 2023	Webinar	1	Futuristic Innovations in Pharmaceutical Arena
Davange Madhuri Daulat	15-07- 2023	Conference	01	Intelligent Automation in Pharmaceutical Industry
Davange Madhuri Daulat	08-07- 2023	FDP	02	Implementing ER 2020: Challenges and Opportunities
Davange Madhuri Daulat	12-01- 2024	FDP	05	Recent Trends in Medical Technology Innovation and Pharmaceuticals
Surana Khemchand Rajendra	12-01- 2024	FDP	5	“Trends in Medical Technology Innovation and Pharmaceuticals “ on 8-12 Jan 2024
Surana Khemchand Rajendra	11-03- 2024	Workshop	1	National Level Article Writing Competition
Surana Khemchand R. Surana	24-12- 2023	Webinar	1	Emerging Trends in Pharmacovigilance and clinical Trials
Surana Khemchand Rajendra	27-04- 2024	Webinar	1	Fundamentals of Pharmaceutical Technology and Research for aspiring Pharmacist
Surana Khemchand Rajendra	17-08- 2024	FDP	6	Empowering Innovations through Comprehensive Approaches to Research & Development
Surana Khemchand Rajendra	23-08- 2024	FDP	8	Trends and Recent Advancements in Analytical Techniques



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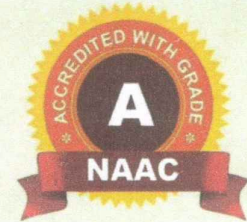
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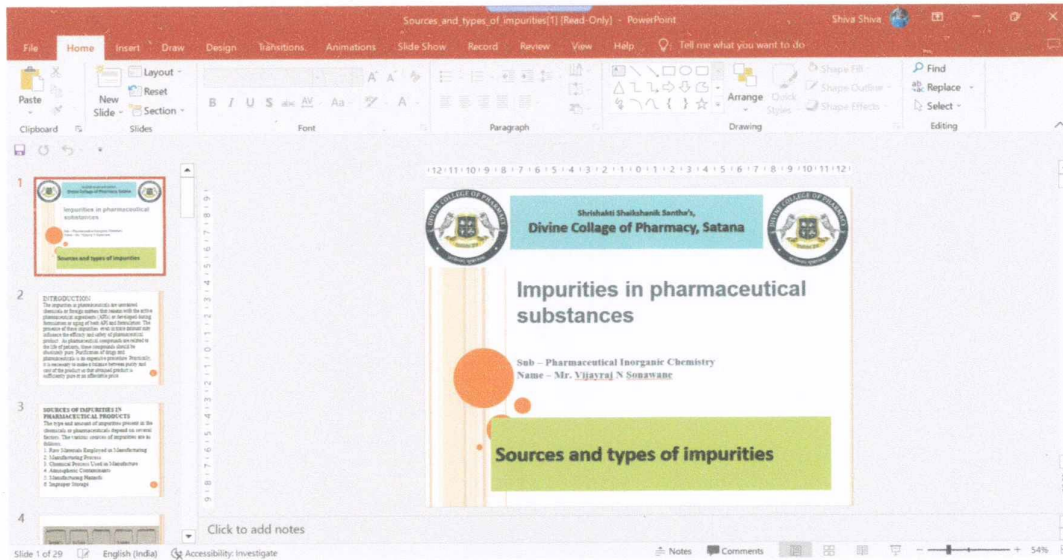
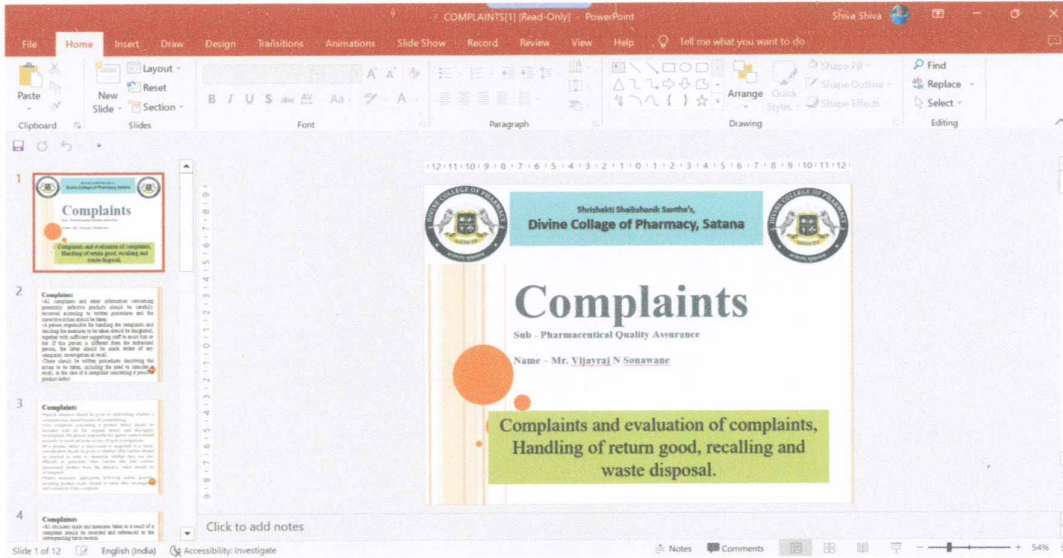
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6. Use of PowerPoint presentation for effective knowledge transfer by staff




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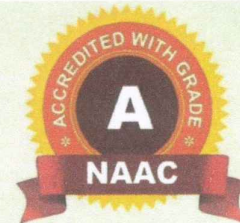
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Chemical kinetics and Drug Stability

Mr. Shivraj Jadhav
Assistant Professor
Divine College of Pharmacy, Satana

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Slide 1 of 80 English (India) Accessibility: Investigate

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Colloids

Mr. Shivraj Jadhav
Assistant Professor
Divine College of Pharmacy, Satana

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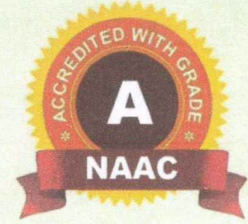
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β-lactam Antibiotics

 **Third Year B Pharm**
Medicinal Chemistry-III

Prof. Khemchand R. Surana
Assistant Professor

SSS's
DIVINE COLLEGE OF PHARMACY, SATANA, NASHIK

Mr. Khemchand R. Surana


Experiment No 01 MWAOS - Microsoft PowerPoint

Slide 1 of 28 - Office Theme - English (United States)

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Experiment No. 01

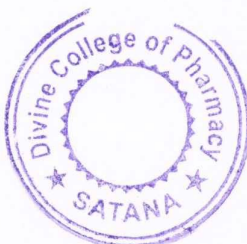
Aim: Demonstration of Microwave assisted organic synthesis for preparation of medicinally important compound.


 **Third Year B Pharm**
Medicinal Chemistry-III Practical

Prof. Khemchand R. Surana
Assistant Professor

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DIVINE COLLEGE OF PHARMACY, SATANA, NASHIK

Mr. Khemchand R. Surana




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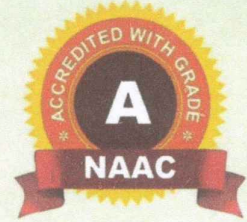
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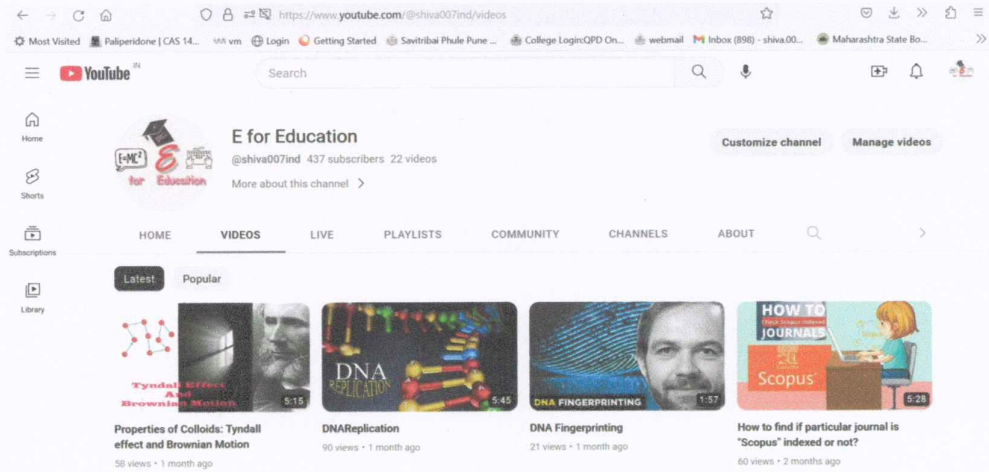
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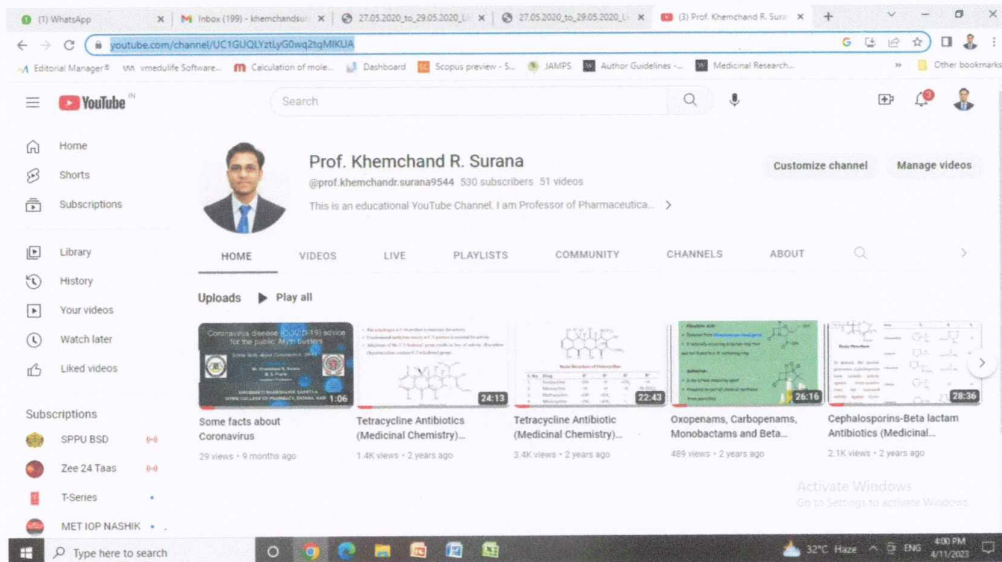


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7. Educational YouTube Channel Run by staff



URL: <https://www.youtube.com/@shiva007ind>



URL: <https://www.youtube.com/channel/UC1GUQLYztLyG0wq2tqMIKUA>




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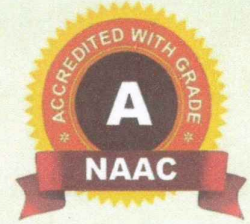
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8. Use of LCD projector, LCD TV, Smart board set for delivery of syllabus content to students



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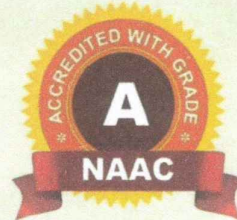
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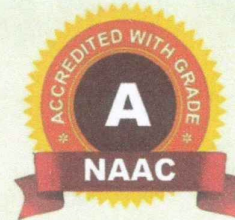
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9. Question Bank

QUESTION BANK SAMPLE




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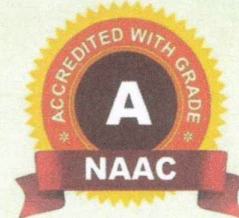
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Year- S.Y.B. Pharmacy

Semester: III


Subject: physical pharmaceutics –I

Subject code: BP302T

Name of teaching staff: Mr Shivraj p. Jadhav

1. Define following terms
 - i) Solubility
 - ii) Saturated solution
 - iii) Supersaturated solution
 - iv) Unsaturated solution
2. How do you express solubility? Define them.
3. Give application of solubility in pharmacy.
4. What are the different factors which influence the solubility of solid in liquid?
5. Name two type of solubility curve with examples.
6. Describe the experimental method to determine solubility of substances in water.
7. Why a piece of filter paper is attached to the 10 ml pipette before pipetting benzoic acid solution from the beaker?
8. Draw the labelled diagram of pH meter and describe the parts
9. Write a Henderson-Hasselbalch equation.
10. Write the principle involved in the determination of pH of a solution.
11. Give the various methods to determine the pH of the solution.
12. Describe the factors influencing pH of a solution.
13. Explain Sorensen's pH scale.
14. How to maintain the pH meter?
15. What is the relation between pH and $[H^+]$?
16. What is pKa and Ka?
17. What do you mean by dissociation constant?
18. Name any four strong acid, strong base, weak acid and weak base.
19. How to determine pKa from half neutralization method?
20. Define Nerst law.




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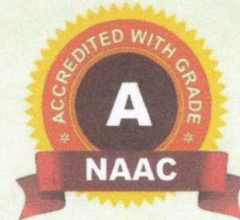
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21. What is the limitation of determination of partition coefficient?
22. Enlist the factors affecting distribution coefficient.
23. Give the equation of partition coefficient for non-dissociable solute, dissociable solute and Associable solute in one of the immiscible layers.
24. Give the application of Partition coefficient in Pharmacy.
25. What is log P value?
26. Change in volume of immiscible solvent or concentration of solute don't affect the partition coefficient value explain.
27. What is dimer?
28. Which solvent system more resemble with the physiology of body to carryout partition coefficient.
29. Define the following terms with examples
 - A. Upper consolute temperature
 - B. Lower consolute temperature
 - C. Conjugate solution
 - D. Tie line
 - E. System having both upper and lower consolute temperature.
30. Explain CST of Phenol Water and Nicotine water system.
31. How you determine CST?
32. Give application of CST.
33. Why CST increases or decreases when a third substance is added? Explain with example.
34. What the principle involved in the determination of percent composition of an added substance using CST method. illustrate with suitable example.
35. What is complexation?
36. Give the classification of complex.
37. Give the application of complexation.
38. Write the principle involved in the analysis of complexes by solubility method using a suitable example.
39. Give the different parameters of complexes to be determined to evaluate complex.




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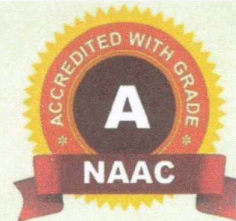
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40. Draw the solubility curve of PABA-Caffeine Complex and explain each part of curve.
41. Name the methods to analyze the complex.
42. What is ligand and metal ion which take part in complexation.
43. What is adsorption and absorption?
44. What is desorption.
45. What is difference between condensation and adsorption.
46. Distinguish between Physical and Chemical adsorption.
47. Factors affecting the degree of adsorption.
48. What is monolayer adsorption.
49. What is activated charcoal.
50. What is adsorption equilibrium.
51. What are the assumptions of Langmuir's adsorption isotherm?
52. Name the pharmaceutical adsorbent.
53. What is effect of temperature on adsorption process.
54. Name the adsorbent used in heavy metal poisoning.
55. What is the application of adsorption in pharmacy?
56. Give the formula of Freundlich and Langmuir adsorption isotherm.
57. What is surface and interface?
58. Define surface and interfacial tension.
59. What is cohesive and adhesive forces.
60. What is surfactant? Name any four surfactants.
61. Give the different type of surfactants.
62. What is the effect of temperature on surface tension?
63. Name the methods to determine surface and interfacial tension.
64. What is unit of surface tension and surface free energy?
65. What is full form of CMC and explain it.
66. How to determine fraction of drop in drop count method? Why it is needed in calculation of surface tension.
67. What is spreading coefficient and wetting property of liquid.




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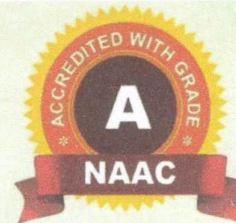
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68. Name the dosage form where property of surface tension is utilized.
69. What is the full form of HLB?
70. Give the different methods to determine the HLB of surfactants.
71. Define saponification and acid number.
72. How to determine density of any liquid.
73. Give the principle of acid-base titration.
74. Name the scientist who discovered pH and HLB scale.
75. Name the apparatus used in density and surface tension determination.

MCQs

1. Which of the following does not have an effect on adsorption from solution onto a solid adsorbent?

- a) Solubility level of solute
- b) Absorption capacity
- c) Temperature of adsorption medium
- d) Surface area of adsorbent

2. What is the main result of adding surfactants into a liquid composed of two immiscible phases such as oil and water?


- a) Reduction in the interfacial tension between the phases
- b) Increase in the interfacial tension between the phases
- c) Catalysation of a chemical reaction between the phases
- d) Nothing happens

3. When there are no external forces, the shape of a liquid drop is determined by

- a) Surface tension of the liquid
- b) Density of liquid
- c) Viscosity of liquid
- d) Temperature of air only

4. The saponification of a fat or oil is done using _____ solution for cold process.



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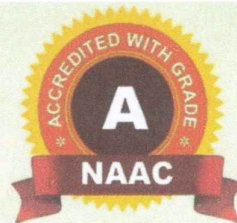
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- a) KOH
- b) NaOH
- c) HCl
- d) NaCl

5. The detergency phenomenon includes

- a) Wetting of the surface
- b) Removal of contaminant from the surface
- c) Avoiding re-deposition of contaminant on surface
- d) All of the above

6. Spreading of liquid occurs when work of adhesion is _____ than work of Cohesion

- a) Greater
- b) Lesser
- c) Same
- d) None of above

7. A solution having a pH value 7 is termed as

- a) Acidic
- b) Basic
- c) Neutral
- d) None of the above


8. pH is defined as...

- a) Positive log of hydrogen ion concentration
- b) Negative log of hydroxide ion concentration
- c) Negative log of hydrogen ion concentration
- d) Positive log of hydronium ion concentration

9. In which method tonicity is adjusted by adding water to the drug solution to make it isotonic?

- a) Cryoscopic method
- b) Sodium chloride method



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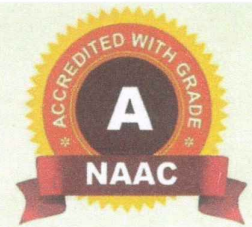
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- c) White Vincent method
- d) pH paper method

10. If a solution having greater osmotic pressure than 0.9% w/v of NaCl is termed as

- a) Isotonic Solution.
- b) Hypertonic solution
- c) Hypotonic solution
- d) Osmotic solution

11. Concentration of NaCl used for making solution isotonic is,

- a) 0.09% w/v
- b) 0.9% w/v
- c) 9% w/v
- d) 0.009% w/v

12. What is E in the White Vincent method of isotonicity adjustment?

- a) Sodium chloride equivalent
- b) Weight of drug
- c) Drug equivalent
- d) Weight of sodium chloride

13. Which electrode is present in the pH meter?

- a) Reference electrode
- b) Measuring electrode
- c) Anode
- d) Both a and b

14. Colligative property depends upon

- a) Number of basic units present in a substance
- b) Addition of properties of individual functional group
- c) Arrangement of atoms and bond structure.
- d) All of the above

15. Refractive index (RI) is defined as the ratio of velocity light in any selected medium to the velocity of light in





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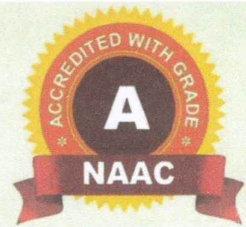
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- a) Vacuum
- b) Glass
- c) Water
- d) None of the above

16. Which types of the prism are present in Abbes refractometer?

- a) Illuminating.
- b) Measuring
- c) Both a and b
- d) None of the above

17. When the substance turns the plane-polarized light towards right side or clockwise, it is called,

- a) Levo as well as dextro
- b) Dextro
- c) Levo
- d) None of the above

18. Dissociation constant can be used for,

- a) Determination of solubility of the drug
- b) Designing of buffer systems
- c) To study the distribution pattern of the drug inside the body
- d) All of the above

19. According to USP, Sparingly soluble means how many parts of solvent required for one part of the solute?

- a) 30-100
- b) 10-30
- c) 100-1000
- d) Less than 1

20. If the temperature increases the solubility of a gas in liquid.....

- a) Decreases
- b) Increases



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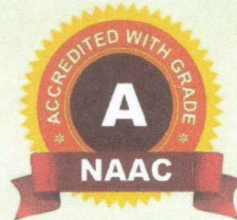
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- c) Does not change
- d) None of the above

21. A solvent containing more amount of solute than its solubilization capacity is called as....

- a) Saturated solution
- b) Supersaturated solution
- c) Unsaturated solution
- d) Real solution

22. The solution which obeys Raoult's law is called as

- a) Ideal solution
- b) Real solution
- c) Binary solution
- d) Saturated solution

23. If salt is added in a solution of gas then....

- a) Precipitation will occur.
- b) Effervescence will occur
- c) The color change will occur
- d) None of the above

24. The solubility of solid will depend upon...

- a) Particle size
- b) Temperature
- c) pH
- d) All of the above.

25. Nernst's distribution law will not be applicable if

- a) Temperature changes
- b) Both solvents are miscible
- c) The molecular form of solute changes
- d) All of the above



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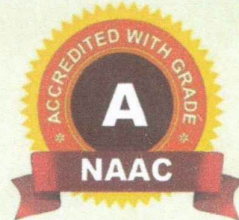
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26. When the sum of partial vapor pressure is more than the total vapor pressure then it is

- a) Negative deviation from Raoult's law
- b) Positive deviation from Raoult's law
- c) Both
- d) None of the above

27. When diffusion occurs along with concentration gradient then it is called as

- a) Active transport
- b) Passive diffusion
- c) Pinocytosis
- d) Transcytosis

28. DuNoys ring method is used for

- a) Surface tension Measurement
- b) Viscosity determination
- c) Refractive index determination
- d) HLB calculation

29. Hot gaseous clouds of atoms is known as

- a) Plasma
- b) Gas
- c) Solid
- d) Atom

30. Surfactant are characterized by presence of

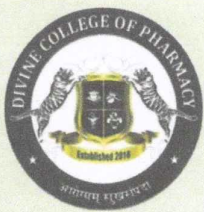
- a) Only hydrophilic groups
- b) Only lipophilic groups
- c) **Both hydrophilic and lipophilic groups**
- d) Neither hydrophilic nor lipophilic groups





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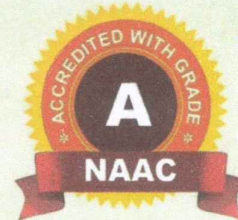
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31. Polymorphism is a phenomenon in which a substance exists in

- a) **More than one crystalline form**
- b) Recemic form
- c) Optically active form
- d) Single form

32. In aerosols, fine droplets of spray are produced using

- a) Nebuliser
- b) Propellant**
- c) Atomizer
- d) Sprayer

33. Solubility of gases in liquids is depends on

- a) Temperature
- b) Pressure
- c) Salting out
- d) All the above**

34. CMC refers to

- a) Aggregation of surfactant**
- b) Aggregation of particles
- c) Coagulation of particles
- d) None of above


35. An Aerosol is

- a) A Suspension of fine particles or droplets**
- b) A Pure gas filled in container
- c) A Liquid filled in container
- d) A mixture of two immiscible liquids only filled in container

36. Drop weight and drop count are the methods used to measure

- a) Surface tension**
- b) Surface area
- c) Particle size




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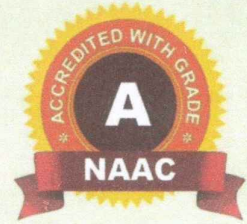
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d) Density

37. Which of the following is NOT method to measure the surface or Interfacial tension

- a) Capillary Rise Method
- b) Drop method
- c) Bubble pressure method
- d) Optical microscopy**

38. Buffer is defined as

- a) Ability to resist the change
- b) Ability to resist a pH increase
- c) Ability to prevent pH from decreasing
- d) Ability to resist pH when small amount small amount acid or base is added**

39. The binding of protein to drugs can influence

- a) may facilitate the distribution of drug throughout the body
- b) inactivate the drug
- c) Retard the excretion of drug
- d) All of the above**

40. In complex formation what is the function of ligand?

- a) Accept the lone pair of electrons
- b) Donate the lone pair of electrons**
- c) Share the one electron
- d) None of the above

41. EDTA is an example of

- a) Monodentate ligand
- b) Bidentate ligand
- c) Tridentate ligand
- d) Hexadentate ligand**

42. Glycine forms a complex with cupric ions only at a range

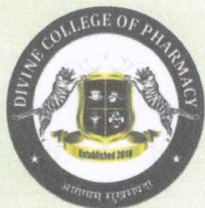
- a) Neutral
- b) Acidic**



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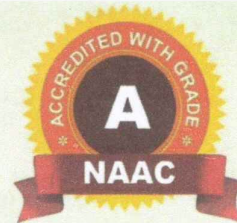
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- c) Neutral
- d) Both acidic and basic

43. Complex stability constant is increased if the ligand is having

- a) Bulky group
- b) High electron density on donor
- c) High solubility
- d) Less ionization

44. Which of the following is TRUE?

- a) An effective buffer has very small absolute concentrations of acid and conjugate base.
- b) A buffer can not be destroyed by adding too much strong base. It can only be destroyed by adding too much strong acid.
- c) A buffer is most resistant to pH change when $[\text{acid}] = [\text{conjugate base}]$
- d) An effective buffer has a $[\text{base}]/[\text{acid}]$ ratio in the range of 10 – 100.

45. Identify a good buffer

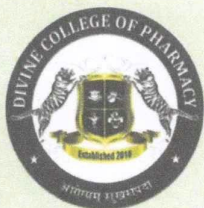
- a) significant amounts of both a strong acid and a strong base
- b) significant amounts of both a weak acid and a strong acid
- c) small amounts of both a weak acid and its conjugate base
- d) significant amounts of both a weak acid and its conjugate base

46. If the ratio of base to acid in a buffer change by a factor of 10, the pH of the buffer

- a) increases by 2.
- b) increases by 1.
- c) decreases by 1.
- d) decreases by 2.




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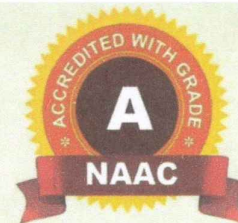
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47. Which one of the following is equal to the pK_a of a weak acid?

- a) its relative molecular mass
- b) the pK_b of its conjugate base
- c) the pH of a solution containing equal amounts of the acid and its conjugate base**
- d) The equilibrium concentration of its conjugate base

48. Which of the following is not a method of liquefaction of gases?

- a) Linde's method
- b) Claude's Method
- c) Faraday's method
- d) All of the above**


49. In which solution heat is not evolved or absorbed?

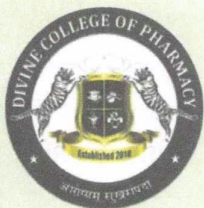
- a) Real solution
- b) Ideal solution**
- c) Saturated solution
- d) Unsaturated solution

50. Phase rule is

- a) $F = C - P + 2$**
- b) $F = C + P - 2$
- c) $F = C + P + 2$
- d) None of the above




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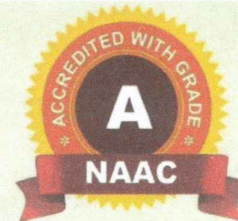
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UNIT - V

pH, BUFFERS, AND ISOTONIC SOLUTIONS

5.7 MULTIPLE CHOICE QUESTIONS:

Q.1. A solution having a pH value 7 is termed as


- a) Acidic
- b) Basic
- c) Neutral
- d) None of the above

Ans.: (a)

Q.2. pH is defined as...

- a) Positive log of hydrogen ion concentration
- b) Negative log of hydroxide ion concentration




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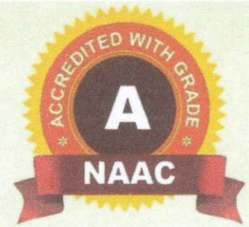
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- c) Negative log of hydrogen ion concentration
- d) Positive log of hydronium ion concentration

Ans.: (c)

Q.3 In which method tonicity is adjusted by adding water to the drug solution to make it isotonic?

- a. Cryoscopic method
- b. Sodium chloride method
- c. White Vincent method
- d. pH paper method

Ans.: (c)

Q.4 If a solution having greater osmotic pressure than 0.9% w/v of NaCl is termed as

- a) Isotonic Solution.
- b) Hypertonic solution
- c) Hypotonic solution
- d) Osmotic solution

Ans.: (b)

Q.5 Concentration of NaCl used for making solution isotonic is,

- a) 0.09% w/v
- b) 0.9% w/v
- c) 9% w/v
- d) 0.009% w/v

Ans.: (b)

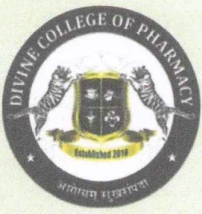
Q.6 The tonicity of solution can be determined by,

- a) Hemolytic method
- b) Cryoscopic method
- c) White Vincent method
- d) Both a and b



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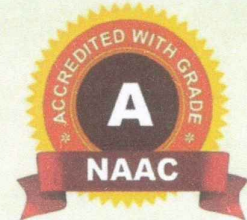
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Ans.: (d)

Q.7 What is freezing point depression of blood?

- a) 0.58 °C
- b) 0.52 °C
- c) 0.55 °C
- d) 5.20 °C

Ans.: (b)

Q.8 What is E in the White Vincent method of isotonicity adjustment?

- a) Sodium chloride equivalent
- b) Weight of drug
- c) Drug equivalent
- d) Weight of sodium chloride

Ans.: (a)

Q.9 In hypertonic solution RBCs

- a) Swell
- b) Shrink
- c) Both
- d) None of the above

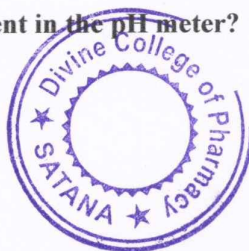
Ans.: (b)

Q.10 If hydrogen ion concentration is 10^{-7} moles/liter the pH will be

- a) 1
- b) 10
- c) 7
- d) None of the above.

Ans.: (c)

Q.11 Which electrode is present in the pH meter?




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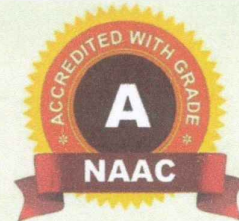
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- Reference electrode
- Measuring electrode
- Anode
- Both a and b

Ans.: (d)

5.8 TRUE AND FALSE:

- 1) Buffer action is defined as the capacity of a buffer to resist a change in pH.

Ans.: True

- 2) Buffers are the agents which resist large change in pH due to the addition of the amount of acid or base.

Ans.: False

- 3) $\text{pH} = \text{pK}_a + \log \frac{[\text{Salt}]}{[\text{Acid}]}$. This is Henderson-Hasselbalch equation for acidic buffer.

Ans.: True

- 4) Red litmus turns blue in basic solutions.

Ans.: True

- 5) The pH of the blood is 6.4.

Ans.: False

- 6) A hypertonic solution has more osmotic pressure than blood.

Ans.: True

- 7) The basic solution has pH from 6 to 14.

Ans.: False

- 8) The pH is defined as a positive logarithm of the hydrogen ion concentration.

Ans.: False

- 9) Buffer capacity is defined as a measure of buffers' magnitude of its resistance to change in pH by the addition of an acid or base.

Ans.: True

- 10) Parenteral preparations don't need to be isotonic.



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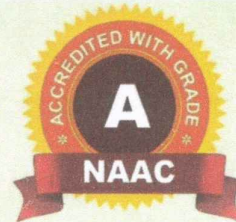
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Ans.: False

11) In a hypotonic solution, RBCs swell.

Ans.: True

5.9 FILL IN THE BLANKS:

1) The pH of the solution can be expressed in numerical terms from.....

Ans.: 0 to 14

2) 7 value indicates an equal concentration of hydrogen and hydroxyl ion concentration hence referred to as..... pH at 25°C.

Ans.: Neutral

3) Acid having pH value ranging from 0-3 are called as

Ans.: Strong acid

4) The resistance to change a pH by buffer is known as.....

Ans.: Buffer capacity

5) A combination of a weak base and its conjugate acid is called.....

Ans.: Basic buffers

6) The buffer should have pK_a to its pH for maximum buffer capacity.

Ans.: Equal

7) Buffer capacity can also be defined as the.....of the amount added of strong acid or base to the small variation in pH (ΔpH) caused by this addition.

Ans.: Ratio

8) The cryoscopic method andmethod are a method of tonicity adjustment from Class I.

Ans.: Sodium chloride equivalent

5.10 VERY SHORT ANSWER TYPE QUESTIONS:

- 1) Write a note on Sorenson's pH scale.
- 2) Explain the pH paper method for the determination of pH.
- 3) Draw a well-labeled diagram of the glass electrode.



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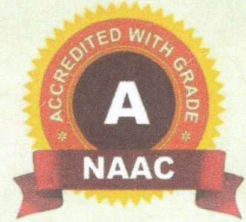
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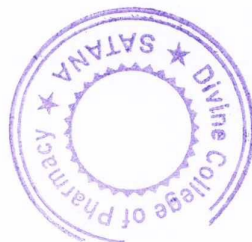
- 4) Define buffer.
- 5) Draw a well-labeled diagram of pH Meter.
- 6) Give ideal requirements for buffer solution.
- 7) Define buffer capacity and buffer action.
- 8) Write the role of buffer in the parenteral formulation.
- 9) Define isotonic, hypotonic, and hypertonic solution.
- 10) What is the effect of the isotonic, hypotonic, and hypertonic solution on RBC?
- 11) List the methods for adjustment of tonicity.

5.11 SHORT ANSWER TYPE QUESTIONS:

- 1) Write a note on Sorenson's pH scale.
- 2) Explain the method for the determination of pH.
- 3) Define buffer and give its components.
- 4) Write a note on buffer capacity.
- 5) Write in detail the application of buffers in pharmaceuticals.
- 6) How the buffer solution is prepared?
- 7) Write in detail about buffers in the biological system.
- 8) Explain methods for the determination of tonicity.

5.12 LONG ANSWER TYPE QUESTIONS:

- 1) Explain different methods for pH determination
- 2) Write in detail the mechanism of acidic and basic buffer action
- 3) Explain in detail the Henderson-Hasselbalch equation for buffer.
- 4) Write a detailed note on buffers in the pharmaceutical and biological system.
- 5) Explain in detail different methods for tonicity adjustment.



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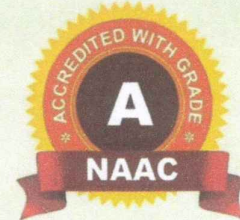
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UNIT II

HYSICOCHEMICAL PROPERTIES OF DRUG

A) MULTIPLE CHOICE QUESTIONS:

1. Colligative property depends upon
 - a) Number of basic units present in a substance
 - b) Addition of properties of individual functional group
 - c) Arrangement of atoms and bond structure.
 - d) All of the above

Ans. (a)

2. Refractive index (RI) is defined as the ratio of velocity light in any selected medium to the velocity of light in
 - a) Vacuum
 - b) Glass
 - c) Water
 - d) None of the above

Ans.: (a)

3. Which is correct Snell's law?



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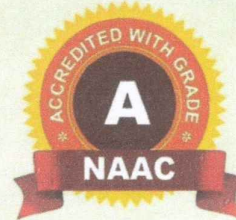
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- a) $n = \frac{\sin r}{\sin i}$
b) $n = \frac{\sin i}{\sin r}$
c) $n = \frac{\sin i}{\cos r}$
d) None of the above

Ans.: (b)

4. The Refractive index is denoted as $[n]_D^{20}$, where 20 is?
a) Melting point
b) Temperature in °F
c) Molecular weight
d) Temperature in °C

Ans.: (d)

5. Which types of the prism are present in Abbes refractometer?
a) Illuminating.
b) Measuring
c) Both a and b
d) None of the above

Ans.: (c)

6. When the substance turns the plane-polarized light towards right side or clockwise, it is called,
a) Levo as well as dextro
b) Dextro
c) Levo
d) None of the above

Ans.: (b)

7. What are the types of dipole moments?
a) Permanent dipole moment
b) Induced dipole moment
c) Both



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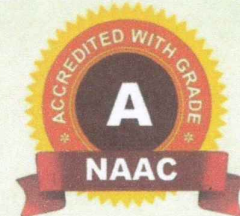
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d) None

Ans.: (c)

8. Dissociation constant can be used for,

- Determination of solubility of the drug
- Designing of buffer systems
- To study the distribution pattern of the drug inside the body
- All of the above

Ans.: (d)

B) TRUE OR FALSE:

1) By using a refractometer, the optical rotation of the compound can be measured.

Ans.: False

2) Refractive index can be used for purity determination of compound

Ans.: True

3) If a chiral atom is present in the molecule it will not show optical activity.

Ans.: False

4) If plane-polarized light is rotated towards the left side or anti-clockwise then it is called levorotatory

Ans.: True

5) Temperature does not affect the refractive index.

Ans.: False

6) The Refractive index (RI) is defined as the ratio of velocity light in any selected medium to the velocity of light in water.

Ans.: False

7) Symmetric molecules show a dipole moment.

Ans.: False

8) The dipole moment is a vector quantity.

Ans.: True




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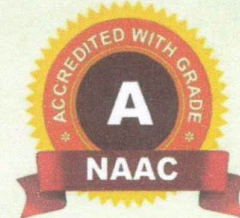
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- 9) A beam of light when allowed to pass from one medium to another, it does not change its direction.

Ans.: False

C) FILL IN THE BLANKS:

- 1) Freezing point depression is property of a substance.

Ans.: Colligative

- 2) Refractive index (RI) is defined as the ratio of velocity light in any selected medium to the velocity of light in.....

Ans.: Vacuum

- 3) When ordinary light is passed through Nicol prism it gets converted into

Ans.: Plane polarized light.

- 4) A molecule having a carbon atom in the center attached to four different groups is called.....

Ans.: Chiral

- 5) The dielectric constant is defined as the ratio of the capacitance of the..... to the capacitance of the

Ans.: Medium, Vacuum

- 6) The electronegative atom present in the molecule causes.....dipole moment.

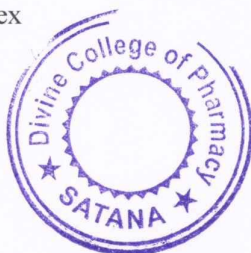
Ans.: Permanent

- 7)compound rotates plane-polarized light towards right side/clockwise

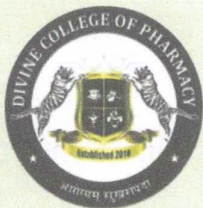
Ans.: Dextrorotatory

D) VERY SHORT ANSWER QUESTION:

- 1) Define - Colligative properties
- Constitutive Property
- Additive Property
- 2) Define - Refractive index
- Refractive index



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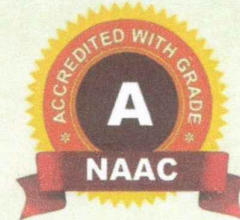
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- Optical rotation
 - Dipole moment
 - Dissociation constant
- 3) Give the equation of Snell's law.
 - 4) The Refractive index is denoted as $[n]_D^{20}$. What is 20 and D?
 - 5) Give advantages of Abbes refractometer.
 - 6) Give the name of parts of the refractometer.
 - 7) What is plane-polarized light?
 - 8) What is a chiral atom?
 - 9) Define specific rotation.
 - 10) Enlist parts of the polarimeter.
 - 11) Where the sample is placed in the refractometer?
 - 12) Define electronegativity.
 - 13) Indicate the dipole moment of molecule HNO_3 .

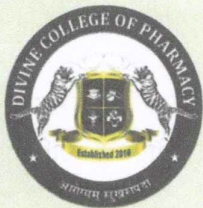
E) SHORT ANSWER TYPE QUESTIONS:

- 1) Explain different types of properties of the substance.
- 2) Define the refractive index, how it is the measure, and give its application.
- 3) Define optical rotation, how it is measured, and give its application.
- 4) Define the Dielectric constant, how it is measured, and give its application.
- 5) Explain the construction and working of Abbes refractometer and polarimeter



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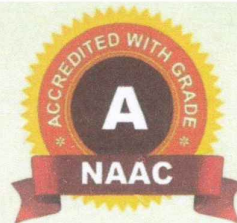
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UNIT-I

SOLUBILITY OF DRUGS

A) MULTIPLE CHOICE QUESTIONS:

3. According to USP, Sparingly soluble means how many parts of solvent required for one part of the solute?
- e) 30-100
 - f) 10-30
 - g) 100-1000
 - h) Less than 1

Ans. (a)

4. If the temperature increases the solubility of a gas in liquid.....
- e) Decreases
 - f) Increases
 - g) Does not change
 - h) None of the above

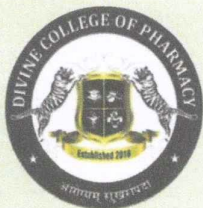
Ans.: (a)

3. A solvent containing more amount of solute than its solubilization capacity is called as....
- e) Saturated solution
 - f) Supersaturated solution
 - g) Unsaturated solution
 - h) Real solution



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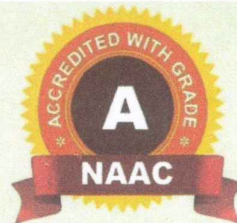
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Ans.: (b)

4. The solution which obeys Raoult's law is called as
- e) Ideal solution
 - f) Real solution
 - g) Binary solution
 - h) Saturated solution

Ans.: (a)

5. If salt is added in a solution of gas then....
- e) Precipitation will occur.
 - f) Effervescence will occur
 - g) The color change will occur
 - h) None of the above

Ans.: (b)

6. The solubility of solid will depend upon...
- d) Particle size
 - e) Temperature
 - f) pH
 - g) All of the above.

Ans.: (d)

7. When a solvent molecule surrounds a solute molecule to solubilize it, is called as
- e) Association
 - f) Solvation
 - g) Dissociation
 - h) none of the above

Ans.: (b)

8. Nernst's distribution law will not be applicable if
- e) Temperature changes
 - f) Both solvents are miscible



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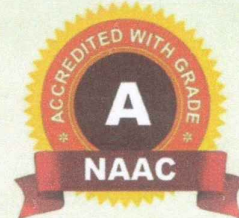
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- g) The molecular form of solute changes
- h) All of the above

Ans.: (d)

9. When the sum of partial vapor pressure is more than the total vapor pressure then it is
- a) Negative deviation from Raoult's law
 - b) Positive deviation from Raoult's law
 - c) Both
 - d) None of the above

Ans.: (b)

10. When diffusion occurs along with concentration gradient then it is called as
- a) Active transport
 - b) Passive diffusion
 - c) Pinocytosis
 - d) Transcytosis

Ans.: (b)

B) STATE TRUE OR FALSE:

- 10) The ideal solution follows Raoult's Law.

Ans.: True

- 11) As temperature increases solubility of solid in liquid always increases.

Ans.: False

- 12) A Carrier molecule is required in passive transport.

Ans.: False

- 13) A polar solvent is required to dissolve the polar solute.

Ans.: True

- 14) If relative energy difference (RED) is more than one then molecules will dissolve.

Ans.: True

- 15) As pressure increases, the solubility of gases in liquids decreases.



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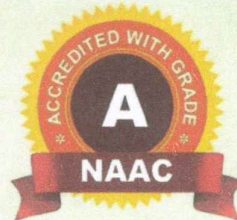
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Ans.: False

- 16) Raoult's law states that in an ideal solution partial vapor pressure of each component is equal to the vapor pressure of that component in pure form multiplied by its mole fraction.

Ans.: True

- 17) In real solution, no heat is evolved or absorbed during mixing.

Ans.: False

- 18) Critical solution temperature is the temperature at which two partial miscible liquid becomes miscible.

Ans.: True

- 19) As particle size increases, the solubility of solid in liquid also increases.

Ans.: True

- 20) Micellar solubilization refers to the use of surfactant to increase the solubility of poorly soluble substance with the formation of micelle.

Ans.: True

- 21) Chemical reaction decreases the solubility of gases in liquid.

Ans.: False

C) FILL IN THE BLANKS:

- 1) The critical solution temperature of the phenol water system is..... °C at..... % w/w of phenol.

Ans.: 66.8, 33.33

- 2) Raoult's law states that the partial vapor pressure of each volatile component of a solution is equal to the product of the vapor pressure of pure component and its.....

Ans.: Mole fraction

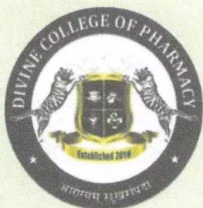
- 3) The process of solubility of a gas in a liquid is governed by law.

Ans.: Henry's

- 4) Fick's first law of diffusion states that is directly proportional to the concentration gradient.



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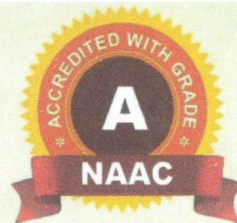
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Ans.: Flux

- 5) If mass transfer remains constant with time then it is.....

Ans.: Steady-state diffusion

- 6) The material which undergoes diffusion is called as.....

Ans.: Diffusant

- 7) The process in which solubility of a weak electrolyte is reduced by the addition of a strong electrolyte is.....

Ans.: Common ion effect

- 8) The decrease in particle size solubility.

Ans.: Increases

- 9) A weakly basic drug is more soluble in medium and an acidic drug is more soluble in medium.

Ans.: Acidic, Basic.

- 10) Gases show in solubility in liquids as temperature increases.

Ans.: Decrease

- 11) If the relative energy difference is....., then molecules will not dissolve

Ans.: More than 1

- 12) The square root of is called a solubility parameter.

Ans.: Cohesive energy density

- 13) Normality is a of solute in 1 liter of solution

Ans.: Gram equivalent weight

- 14) The solution in which the amount of dissolved and undissolved substance is in is called a saturated solution.

Ans.: Equilibrium

D) VERY SHORT ANSWER QUESTIONS:

- 1) Define solubility in a quantitative and qualitative way.
- 2) Give the difference between active and passive diffusion.



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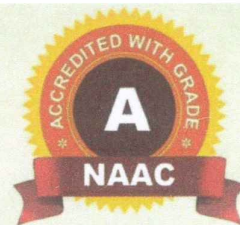
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- 3) Define solute, solvent, and solution.
- 4) State Raoult's law.
- 5) Define saturated, unsaturated, and supersaturated solutions.
- 6) Draw table indicating USP solubility expressions.
- 7) State different quantitative solubility expressions.
- 8) What are association and solvation?
- 9) State Fick's first law of diffusion.
- 10) Give the difference between ideal and real solutions.
- 11) Define critical solution temperature with example.
- 12) Draw a well-labeled phase diagram of the phenol water system.
- 13) Give limitations of Nernst's Distribution law.

E) SHORT ANSWER QUESTIONS:

- 1) Explain different types of solutions.
- 2) Write a note on solubility expressions.
- 3) Write a note on Association and Dissociation.
- 4) Explain Fick's first and second law of diffusion.
- 5) Explain Raoult's law.
- 6) Write a note on Nernst's distribution law, its applications and limitations.
- 7) Write a note on the mechanism of solute-solvent interaction.

F) LONG ANSWER QUESTIONS:

- 1) Write a detailed note on the ideal solubility parameter.
- 2) Explain different factors affecting the solubility of solid in a liquid.
- 3) Write in detail notes on the diffusion principle of the biological system.
- 4) Explain factors affecting the solubility of a gas in a liquid.
- 5) Write a note on a partially miscible liquid-liquid system.
- 6) Explain Raoult's law and explain the positive and negative deviation from it.



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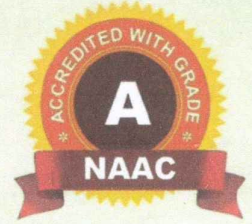
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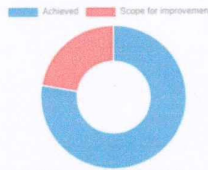
Academic Year 2023-24

VmEduLife Software form and Analysis of feedback

12/4/24, 2:40 PM vmedulife Account

Question	Course content were delivered through proper way			
Answer	Value	No. of response(s)	Response value	Response %
● Excellent	5	886	4430	33.02
● Very Good	4	854	3416	31.83
● Good	3	787	2361	29.33
● Average	2	122	244	4.55
● poor	1	34	34	1.27
Performance				78.16
Final Attainment				2.34

Questionwise Attainment	
Activity Number	Attainment
1	2.35
2	2.35
3	2.34
4	2.33
5	2.33
6	2.32
7	2.32
8	2.32
9	2.29
10	2.34



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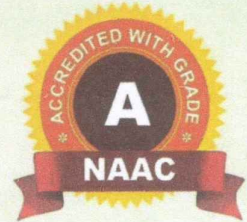
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Question	The learning and teaching methods encourage active participation			
Answer	Value	No. of response(s)	Response value	Response %
● Excellent	5	856	4280	31.90
● Very Good	4	873	3492	32.54
● Good	3	776	2328	28.92
● Average	2	138	276	5.14
● Poor	1	40	40	1.49
Performance	77.64			
Final Attainment	2.33			



Question	The course stimulated my interest and though on the subject area			
Answer	Value	No. of response(s)	Response value	Response %
● Excellent	5	829	4145	30.90
● Very Good	4	885	3540	32.99
● Good	3	806	2418	30.04
● Average	2	117	234	4.36
● Poor	1	46	46	1.71
Performance	77.40			
Final Attainment	2.32			



Question	The overall environment in the class was motivating to learning			
Answer	Value	No. of response(s)	Response value	Response %
● Excellent	5	868	4340	32.35
● Very Good	4	831	3324	30.97
● Good	3	806	2418	30.04
● Average	2	132	264	4.92
● Poor	1	46	46	1.71
Performance	77.47			
Final Attainment	2.32			



Question	Ideas and concepts of course were presented clearly			
Answer	Value	No. of response(s)	Response value	Response %
● Excellent	5	849	4245	31.64
● Very Good	4	836	3344	31.16
● Good	3	826	2478	30.79
● Average	2	130	260	4.85
● Poor	1	42	42	1.57
Performance	77.29			
Final Attainment	2.32			



Question	I participated actively in the course			
Answer	Value	No. of response(s)	Response value	Response %
● Excellent	5	803	4015	29.93
● Very Good	4	836	3344	31.16
● Good	3	859	2577	32.02
● Average	2	135	270	5.03
● Poor	1	50	50	1.86
Performance	76.45			
Final Attainment	2.29			



<https://portal.vmedulife.com/faculty/feedback/student/StudentFeedback.php>

2/3



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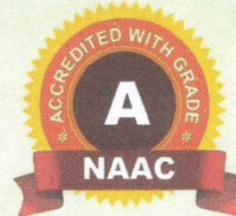
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12/4/24, 2:40 PM

vmedulife Account



Divine College of Pharmacy, Satana

Combined Feedback Analysis

Academic Year : 2023-24

This report consists of following activities :

Title : Student Feedback About Course (Even SEM) Term-II (Attended By : SEM VIII, SEM VI, SEM IV, SEM II)

Title : Student Feedback about Course ODD SEM (Term-I) 2023-2024 (Attended By : SEM III, SEM I)

Total number of response(s) : 2683

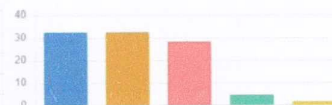
Question	Course objective is clear			
Answer	Value	No. of response(s)	Response value	Response %
● Excellent	5	938	4690	34.96
● Very Good	4	820	3280	30.56
● Good	3	747	2241	27.84
● Average	2	136	272	5.07
● Poor	1	42	42	1.57
Performance	78.46			
Final Attainment	2.35			



Question	The syllabus of subject covers need of course you undergo			
Answer	Value	No. of response(s)	Response value	Response %
● Excellent	5	854	4270	31.83
● Very Good	4	936	3744	34.89
● Good	3	742	2226	27.66
● Average	2	114	228	4.25
● Poor	1	37	37	1.38
Performance	78.31			
Final Attainment	2.35			



Question	Syllabus is relevant to current scenario of pharmacy world			
Answer	Value	No. of response(s)	Response value	Response %
● Excellent	5	879	4395	32.76
● Very Good	4	875	3500	32.61
● Good	3	764	2292	28.48
● Average	2	125	250	4.66
● Poor	1	40	40	1.49
Performance	78.10			
Final Attainment	2.34			



Question	The provision of learning resources is adequate in the library			
Answer	Value	No. of response(s)	Response value	Response %
● Excellent	5	858	4290	31.98
● Very Good	4	872	3488	32.50
● Good	3	786	2358	29.30
● Average	2	122	244	4.55
● Poor	1	45	45	1.68
Performance	77.71			
Final Attainment	2.33			



<https://portal.vmedulife.com/faculty/feedback/student/StudentFeedback.php>

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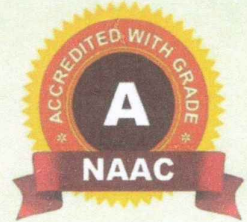
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Best Practice 2: Green Initiative

11. Well-developed Medicinal Garden:



Use of Drip Irrigation for plant watering purpose



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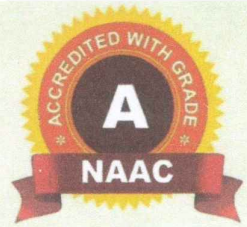
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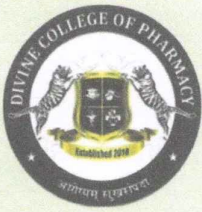


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12. Plastic free campus sign boards:



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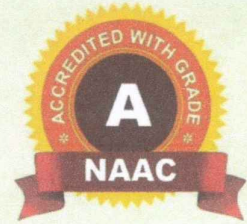
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13. Certified from various agencies:

a. Green Campus certificate from Vmedulife: 2023-24



to recognize the participation in the vmedulife "GO GREEN" initiative and to honour the valuable contribution made towards implementation of the online platform which contributes for sustaining greener nation.

We appreciate the involvement and cooperation extended by all the stakeholders in making this drive a success.



[Signature]
Director
VMEDULife Pvt. Ltd.

This certificate of green campus remains the property of VMEDULife Pvt. Ltd. For current validity of certificate, visit www.vmedulife.com



[Signature]
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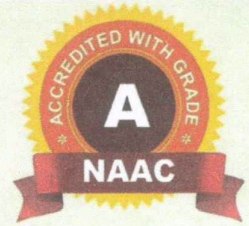
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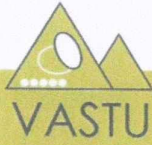
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b. Certificate of architect for drainage facility and sewage disposal facility:



Rohini Marathe B.Arch., A.I.A., A.I.V.

Architect | Interior Designer | Landscape Designer | Valuer

Shop No. : 4, Ganraj Sankul, Panchvati Karanja, Nashik.

A-6, First Floor, Patil Presidency, Collage Road, Nashik.

Mob. : 9421502770

Email : vastuarchitects26@gmail.com

13/04/16

CERTIFICATE

This is to certify that, Proposed Divine College of Pharmacy located at Survey No.100/1, Nampur Road, Satana, Tal-Satana, Dist-Nashik has proper facilities for drainage and sewage disposal, functional toilets for physically disabled, barrier free environment, all weather approach road and adequate space for parking.

Sign of Architect

Ar. Rohini S. Marathe
Reg. No. CA/2000/26733



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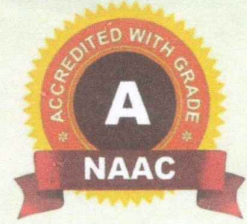
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c. Certificate of commitment from central vigilance commission:


सत्यमेव जयते

CENTRAL VIGILANCE COMMISSION

Certificate of Commitment

This is to certify that

DIVINE COLLEGE OF PHARMACY


has adopted the Integrity Pledge and is committed to uphold highest standards of integrity and good governance and to follow ethical practices in conducting its activities


7736526384


Nilam Sawhney
Secretary

Central Vigilance Commission, Satarkta Bhawan, G.P.O. Complex, INA, New Delhi-110023
Tel: 011- 24600200 (30 Lines), Fax No. 011- 24651010/24651186, Website: www.cvc.nic.in




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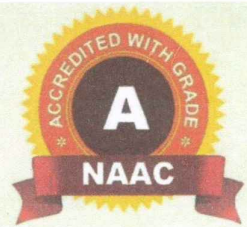
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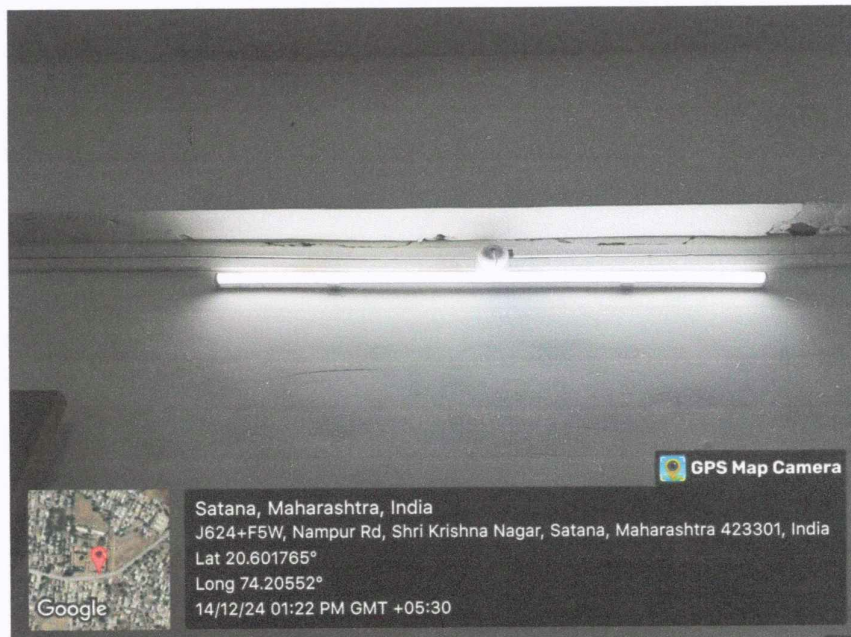
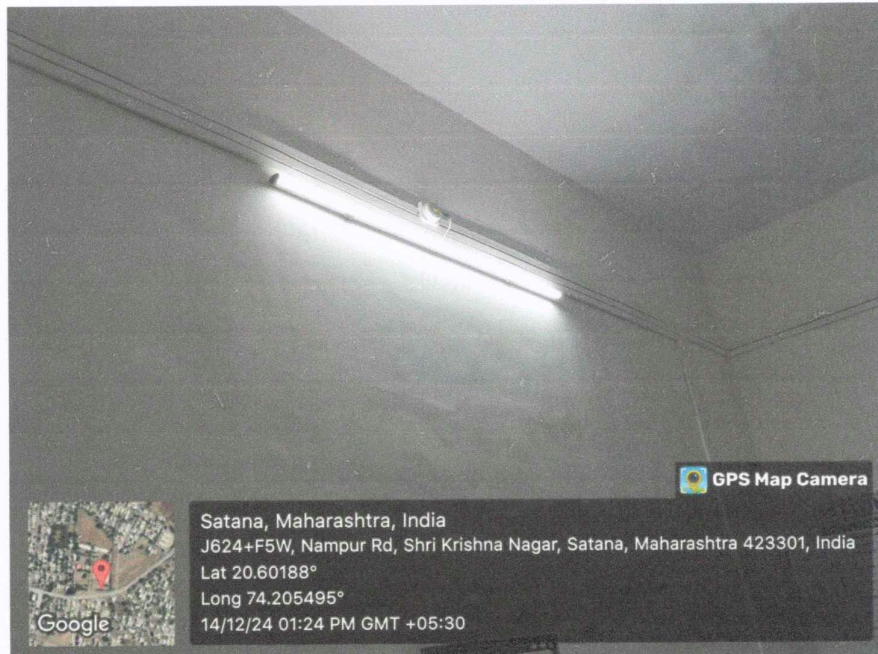
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14. Use of LED based lights, power efficient instruments in the College Campus for Energy Conservation



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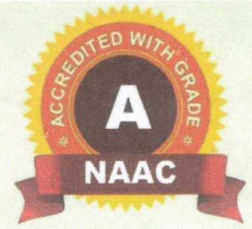
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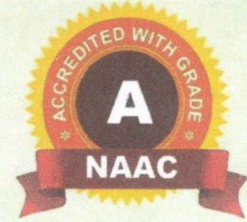
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15. Use of Bicycles by Students




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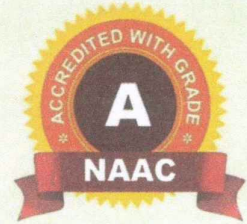
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16. Management of various types of degradable and non-degradable waste:




Municipal Vehicle collects non-degradable waste daily



Vermicompost plant for bio-degradable waste




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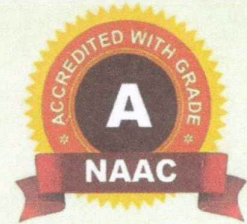
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17. Use of Dustbins in the campus premises




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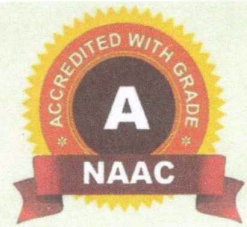
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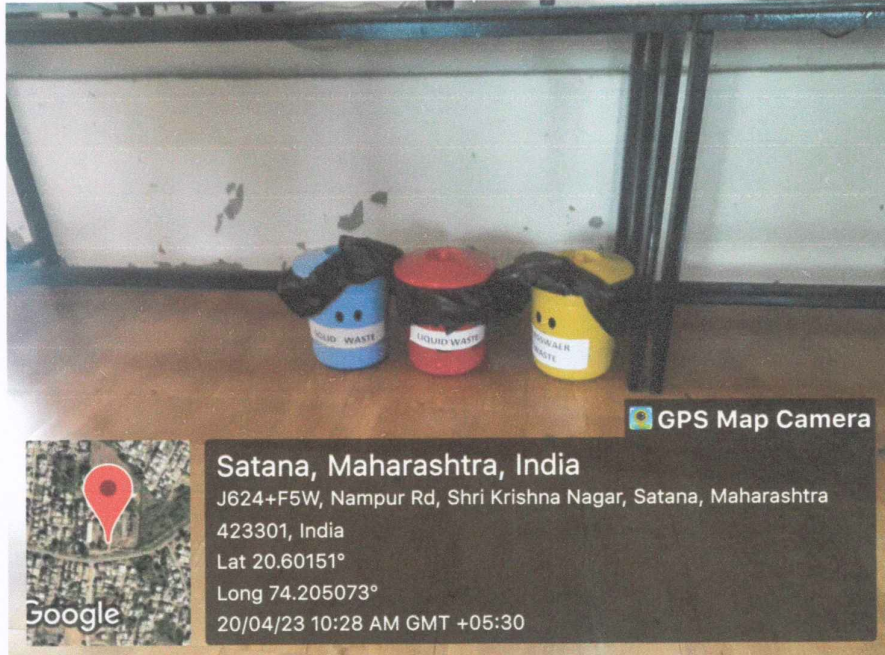
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Use of Different coloured dustbins in the laboratory




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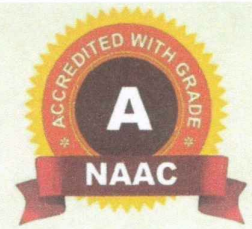
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18. Vermicompost Plant for Bio-Degradable Waste




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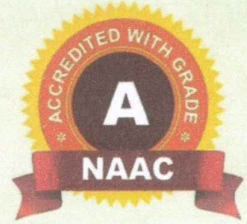
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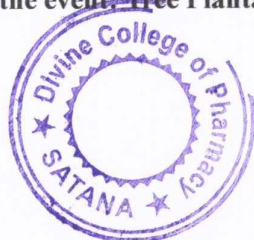
19.Green campus initiatives

Tree Plantation:

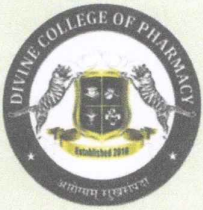
Date: 01/08/2023



Name of the event: ~~Tree~~ Plantation



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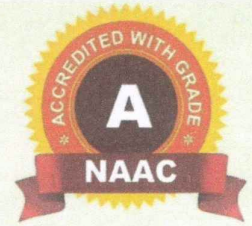
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Date: 19/01/2024



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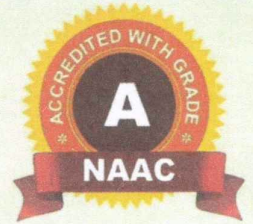
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20. Beyond the Campus green Initiative by college:

Mega Tree Plantation Drive by college Students in Mulane Village area



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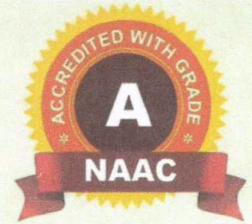
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21. Collection of Ganesh Idols instead of their "Visarjan" in River, which helps to preserve River Ecology



Satana, Maharashtra, India
H6X3+JW3, 60 Feet Rd, Mitra Nagar, Satana, Maharashtra 423301, India
Lat 20.599203°
Long 74.20486°
28/09/23 11:22 AM GMT +05:30



Satana, Maharashtra, India
H6X3+JW3, 60 Feet Rd, Mitra Nagar, Satana, Maharashtra 423301, India
Lat 20.599221°
Long 74.204576°
28/09/23 11:19 AM GMT +05:30



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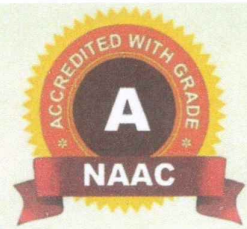
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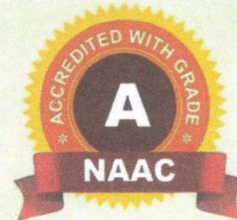
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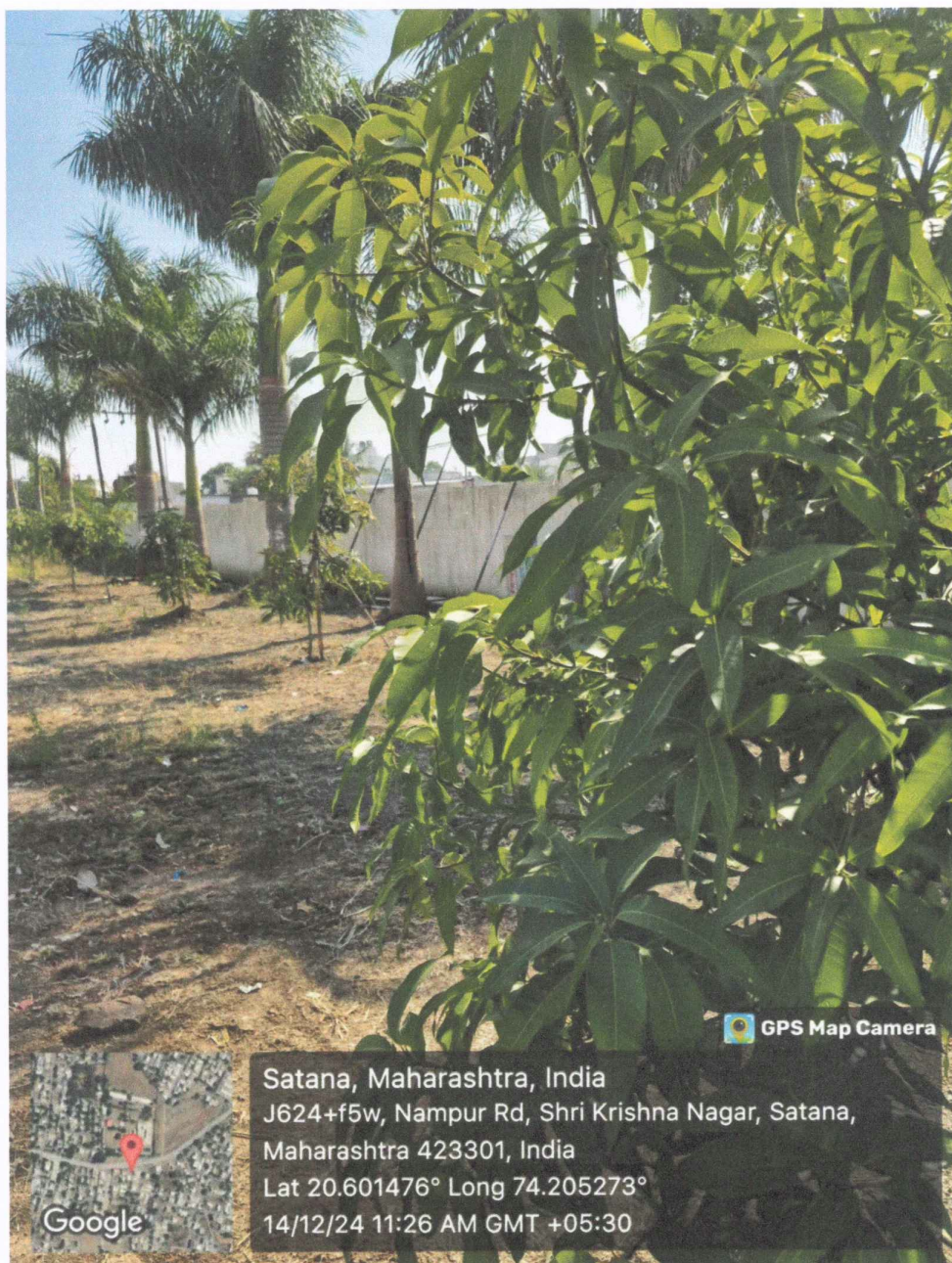
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22. Campus with well flourished Flora and Fauna:




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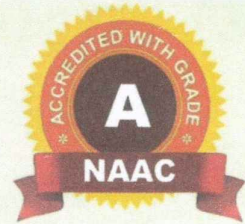
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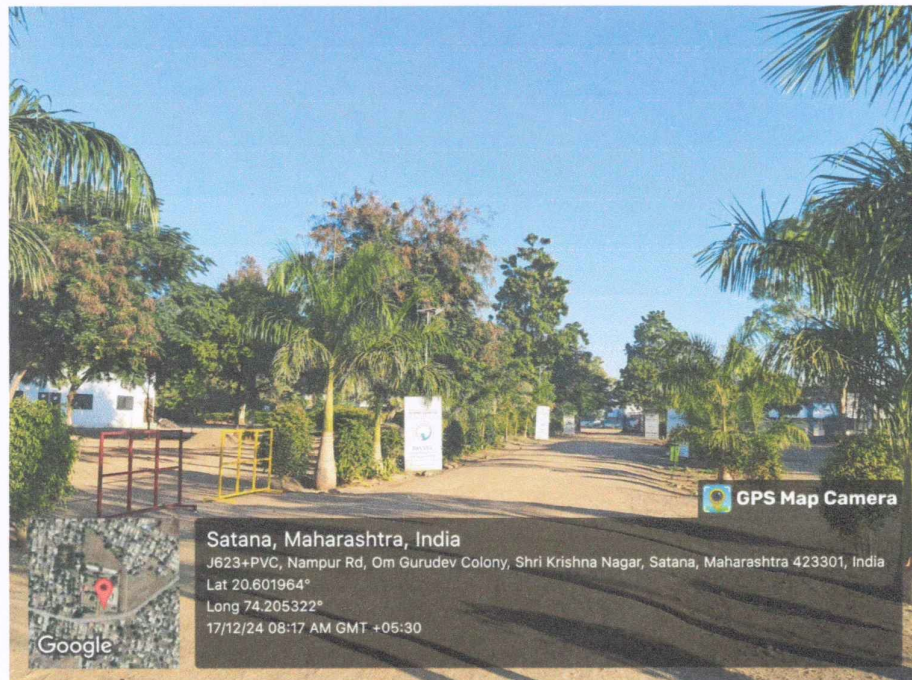
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E-mail: divinecop15@gmail.com

Web: www.divinepharmacy.in



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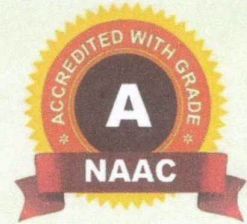
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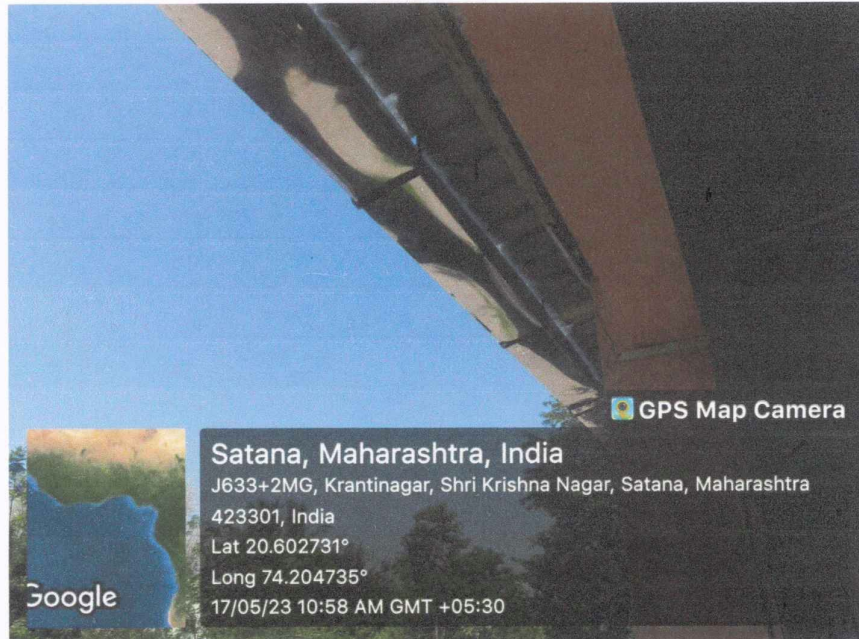
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23. Rain Water harvesting facility:




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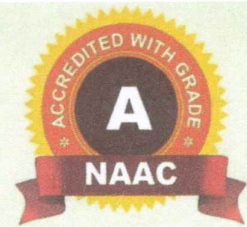
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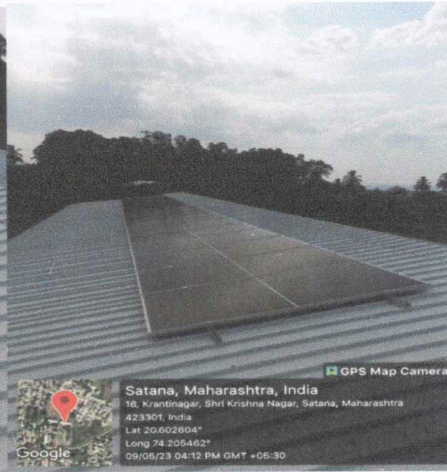
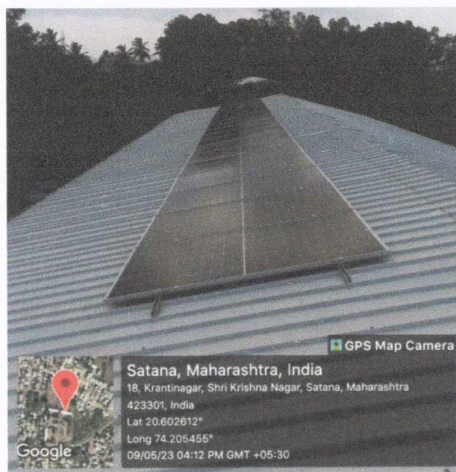
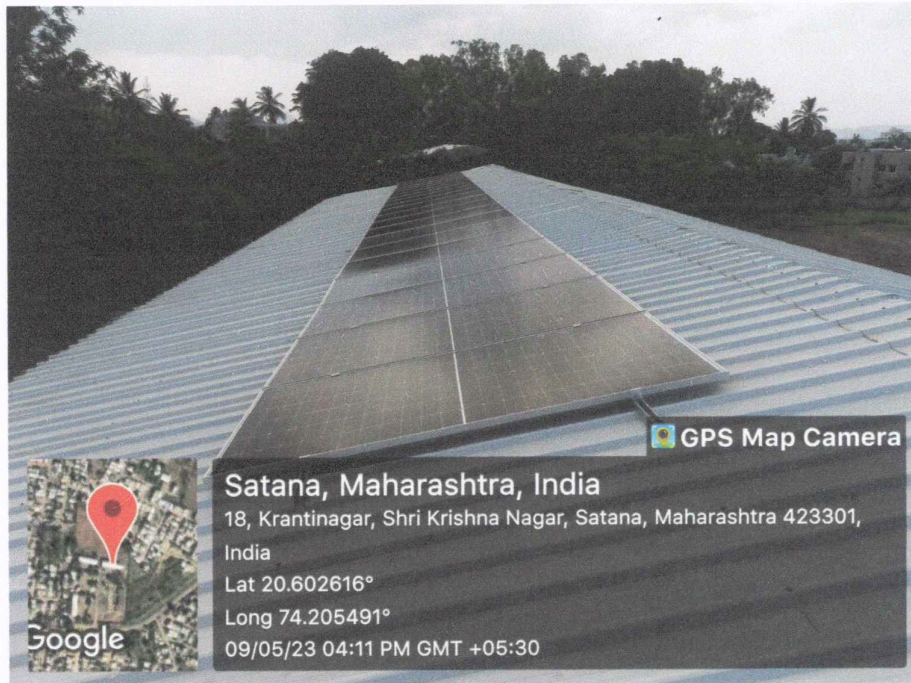
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24. Solar system for generating electricity:




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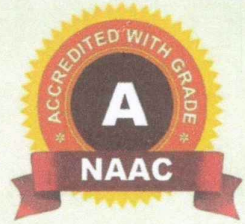
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25.Green and Energy Audit Report

Energy & Green Audit Report – Divine College of Pharmacy, Satana, Nashik



PowerTech Energy Solutions
Conserve to Consume

Energy & Green Audit Report of Divine College of Pharmacy, Satana, Nashik



Submitted By

PowerTech Energy Solutions

Reg. Office: - 6, Vaikuntha Apt, Hire Nagar, Nashik-Pune Road, Nashik-422 011

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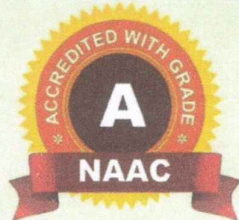
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Pune Office: - 3rd Floor, Phuge Prma, Bhosari Pimpri Chinchwad, 411039 Mob. +91 9226936163,
Email: info@ptesolutions.in,
www.ptesolutions.co.in

ENERGY & GREEN AUDIT COMPLETION CERTIFICATE

This is to certify that following utility has carried out Energy & Green Audit for the academic year of 2021-22 as per guidelines laid down in The Energy Conservation Act, 2001 in the month of April 2022

Name of the Installation	Divine College of Pharmacy, Satana.
Details of Facilities Audited	Main college building including laboratories, libraries, Classroom etc.
Date of Energy and Green Audit	19 April 2023
Name of Certified Energy Auditor	Mr. Swapnil Gaikwad
Certification No.	EA 20121
Validity of the Certificate	18 April 2024

Authorised Signatory



Digitally signed by Atul
Sharad Kakad
Date: 2023.05.13 09:11:20
+05'30'

Atul S Kakad

PowerTech Energy Solutions

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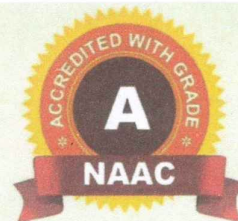
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Energy & Green Audit Report – Divine College of Pharmacy, Satana, Nashik

Our Certificates

BEE Certified Energy Auditor Certificate	
Regn. No. EA-20121	Certificate No. 6299
 National Productivity Council (National Certifying Agency) PROVISIONAL CERTIFICATE	
This is to certify that Mr. / Mrs. / Ms. <u>Swapnil Sanjay Gaikwad</u> son / daughter of Mr. <u>Sanjay J. Gaikwad</u> has passed the National Certification Examination for Energy Auditors held in August - 2014, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India. He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor. He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act. This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency.	
Place : Chennai, India	 Controller of Examination
Date : 9 th January, 2015	




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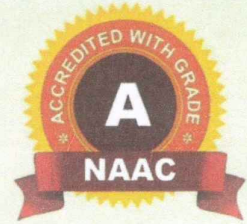
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Lead Auditor Certificate – ISO 50001: Energy Management System



PR366: ISO 50001:2018 Lead Auditor (Energy Management System) Training Course

Certificate of Achievement

Atul Kakad

has successfully completed the above mentioned course and examination.

26th - 30th November 2019

PUNE, INDIA

Certificate No. 35258395 07

Delegate No. 222777

for TUV NORD CERT GmbH

Essen, 2020-01-08

The course is certified by CQI and IRCA (Certification No. 2088). The learner meets the training requirements for those seeking certification under the IRCA EnMS Auditor certification scheme.

TUV NORD CERT GmbH

Langemarckstraße 20


45141 Essen

www.tuev-nord-cert.com



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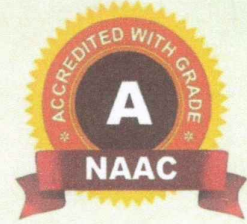
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MEDA Registration Certificate

MAHARASHTRA ENERGY DEVELOPMENT AGENCY



Maharashtra Energy Development Agency

(A Government of Maharashtra undertaking)
Aundh Road, Opposite Spicer College,
Near Commissionerate of Animal Husbandry, Aundh, Pune - 411 067
Ph No: 020-26614393/266144403
Email: eee@mahaurja.com. Web: www.mahaurja.com

ECN/2022-23/CR-44/3803

4th October, 2022

CERTIFICATE OF REGISTRATION FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with **MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)** under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm : M/s PowerTech Energy Solutions
Office No. 10, B-wing, 3rd floor,
Phuge Prima, Bhosari Dighi Road Bhosari,
Pimpri Chinchwad- 411 039.

Registration Category : Empanelled Consultant for Energy Conservation Programme for Class 'A'


Registration Number : MEDA/ECN/2022-23/Class - AEA-31

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **3rd October, 2024** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.


General Manager (EC)

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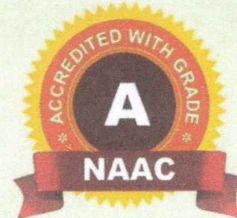
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Energy & Green Audit Report – Divine College of Pharmacy, Satana, Nashik

1 Executive Summary – Energy Audit

ECM	Area	Observations	Proposed Action	Estimated Annual Energy Saving	Estimated Annual CO ₂ Emission Reduction	Estimated Annual Monetary Savings	Estimated Investment	Payback Period
				kWh	Tones	Rs. Lakh	Rs. Lakh	Months
ECM-1	Fan	There are 31 fans used in Collage which are conventional	Replace existing 75-watt conventional ceiling fans with 40-watt energy efficient fans	2107	1.7	0.17	1	77
SUM				2107	1.7	0.17	1.1	77.2
Annual Energy Consumption of the Collage (kWh)				13937				
% Saving on Energy Usage				15.1%				
Annual Energy Bill of the Collage (Rs. In Lakhs)				1.7				
% Savings on Energy Bill				9.9%				

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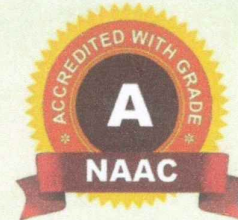
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Energy & Green Audit Report – Divine College of Pharmacy, Satana, Nashik

2 Executive Summary – Green Audit

Sr.No	Area	Observations	Remark
1	Tree Plantation and Awareness about Energy Conservation	College has carried out tree plantation activity. Several types of trees have been planted by students and staffs	Good initiative taken by college toward green campus
2	Use of renewable energy – Solar Water Heating system	Solar Water Heating system of 500 Liters has been installed by college for water heating purpose	Good initiative taken by college towards use of renewable energy
3	Vermicomposting plant.	College has taken initiative to compost the daily solid waste by means of vermicomposting plant. College is using the compost in the campus garden area and distributing it to nearby farmers, as this promotes sustainability and helps to reduce waste.	This is good imitative by college and commitment towards to improve soil quality and support healthy plant growth.




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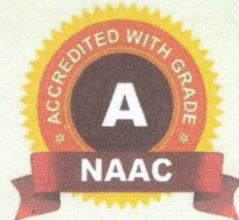
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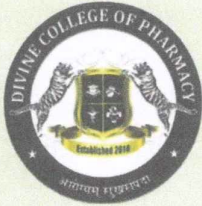
Energy & Green Audit Report – Divine College of Pharmacy, Satana, Nashik

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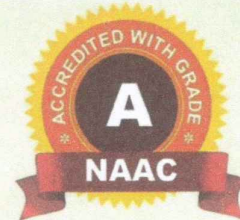
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3 Acknowledgement

PowerTech Energy Solutions extends gratitude Divine College of Pharmacy, Satana. for extending us the opportunity to conduct the Energy & Green Audit.

We are thankful to the professors & supporting staff of the college for their transparency & consistent support in sharing relevant information and for providing data about policies and projects along with their other valuable information. This report would have not been possible without their support.

The study team would like to acknowledge the following distinguished personnel's Divine College of Pharmacy, Satana. in person for the diligent involvement and cooperation.

Dr. Dhananjay Patil

Principal

Mr. Shivraj Jadhav

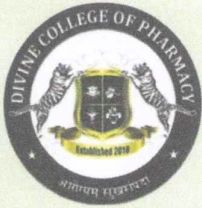
Green Coordinator

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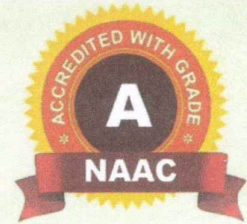
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4 About College

At Shri Shakti Shikshan Sanstha Divine College of Pharmacy, we help our youngsters to enthusiastically train themselves to become a part of the "Marching Forces" of India to its goal of prosperity for all. We invite you to our campus for great learning experience, and We assure you that you will have the most enjoyable and memorable period of your life that you will want to live over and over again even long after leaving our portals. Pharmacists provide the medical experts with all dependable drugs and tonics to treat malnutrition and ill health. The emerging global pharmaceutical scenario and health care with the advent of WTO has thrown several challenges to all Indian Scientists & Technologists. We are ready and willing to accept the challenge. It has been a long but interesting journey for us in India from the time when life-saving drugs had to be imported to the current scenario when Indian manufactured original formulations hit the global market. Several of our Students and faculty members have been inspired by us by our environment and have gone on for higher studies in India and abroad.

4.1 Mission


To shine in professional pharmacy education through student centered learning with honesty & service to society.

4.2 Vision

To devote in nation framework by transforming students through Pharmacy Profession into responsible citizens, the innovators and the entrepreneurs, by rightly in stilling knowledge, skills and attitude.

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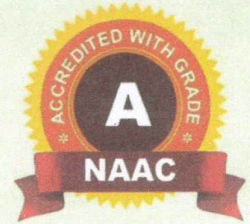
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5 Energy Audit

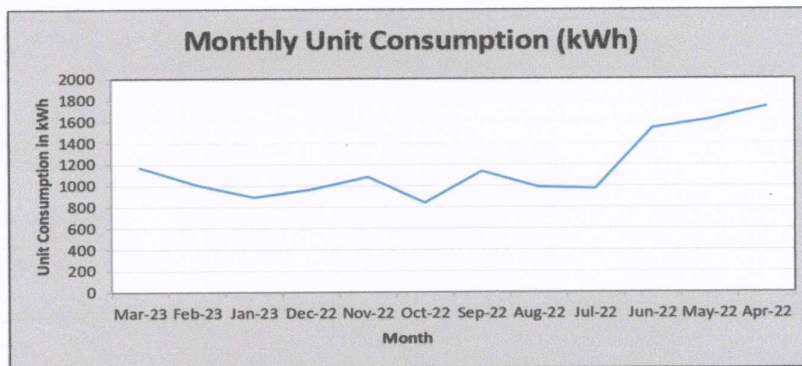
An energy audit is an inspection, survey and analysis of energy flows, for energy conservation in a building, process or system to reduce the amount of energy input into the system without negatively affecting the output(s). In commercial and industrial real estate, an energy audit is the first step in identifying opportunities to reduce energy expense and carbon footprints.

5.1 Electricity Bill Analysis

At present, one electricity meter is there for all campus. Bill analysis for the last 12 months below (Consumer number – 54014005890)

Consumer Name	SHRI SHAKTI SHAIKSHNIK SANSTHA
Consumer Number	54014005890
Contract Demand (KVA)	52 LT-II A
Tariff	88 LT-VII B I

Below graphs shows the monthly energy consumption, Bill amount etc.



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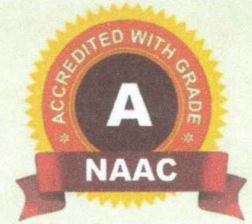
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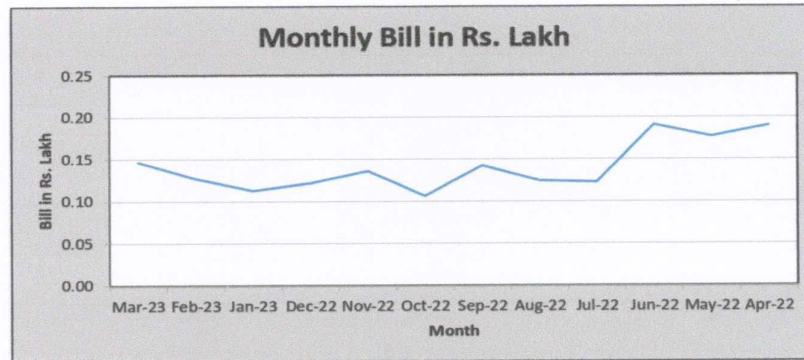
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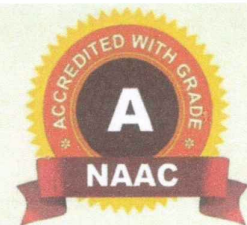
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Month	Unit Consumption	Demand Charges	Wheeling Charges @01.38 /U	Energy Charges	FAC charges	Electricity Duty@7.5%	Tax on sale	Total Current Bill	Total Current Bill	Avg. Unit Rate
	kWh	Rs	Rs	Rs	Rs	Rs	Rs	Rs	Rs. Lakh	Rs/kVAh
Mar-23	1169	427	1578	8265	1637	2500	223	14630	0.15	12.51
Feb-23	1008	427	1361	7127	1411	2168	192	12686	0.13	12.59
Jan-23	891	427	1203	6299	1247	1927	170	11273	0.11	12.65
Dec-22	964	427	1301	6815	1350	2078	184	12155	0.12	12.61
Nov-22	1082	427	1461	7650	1515	2321	206	13579	0.14	12.55
Oct-22	838	427	1156	5925	1173	1817	160	10658	0.11	12.72
Sep-22	1134	427	1531	8017	1588	2428	216	14207	0.14	12.53
Aug-22	985	427	1330	6964	1379	2121	188	12408	0.12	12.60
Jul-22	971	427	1311	6865	1359	2092	185	12239	0.12	12.60
Jun-22	1539	427	2078	10881	2155	3263	293	19096	0.19	12.41
May-22	1617	427	2183	11432	323	3017	308	17690	0.18	10.94
Apr-22	1739	427	2348	12295	348	3238	331	18986	0.19	10.92
Min	838	427	1156	5925				10658	0.11	10.92
Avg	1161	427	1570	8211				14134	0.14	12.30
Max	1739	427	2348	12295				19096	0.19	12.72
Total	13937	5,124	18840	98535				169607	2	

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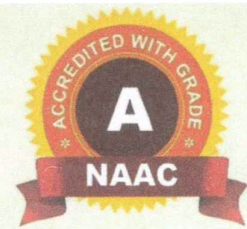
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5.2 Observations & Remark

Sr.No.	Parameter	Observation	Remark
1	Contract Demand (KVA)	Contract demand of the college is 6 kVA	No action required
2	Connected Load	Connected Load of the plant is 5 kW	No action required
6	Unit consumption	Minimum unit consumption recorded is 838 kWh in the month of Oct-22	No action required
		Avg. unit consumption recorded is 1161 kWh	No action required
		Maximum unit consumption recorded is 1739 kWh in the month of April-22	No action required
8	Total bill	Avg. monthly electricity bill is 0.14 Rs. Lakh	No action required
		Total annual electricity bill is 2 Rs. Lakh	No action required



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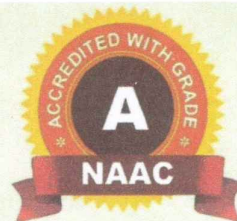
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5.3 Connected Load

Name of the Space	Type of Load	Total Qty	Used Qty	Wattage	Load in Kw	Daily Op hr	Daily kWh	Mthly kWh
Principle Cabin	LED Tube	3	3	18	0.05	8.00	0.4	11
Exam	LED Tube	1	1	18	0.02	7.00	0.1	3
Account	LED Tube	1	1	18	0.02	7.00	0.1	3
Computer Lab	LED Tube	2	2	18	0.04	8.00	0.3	8
Class Room -1	LED Tube	2	2	18	0.04	8.00	0.3	8
Reading Room	LED Tube	2	2	18	0.04	4.00	0.1	4
Library	LED Tube	3	3	18	0.05	8.00	0.4	11
Store	LED Tube	2	2	18	0.04	8.00	0.3	8
P' Analysis Lab	LED Tube	3	3	18	0.05	2.00	0.1	1
P' Celtics	LED Tube	3	3	18	0.05	2.00	0.1	1
P' Chemistry	LED Tube	3	3	18	0.05	2.00	0.1	1
Machine Room	LED Tube	2	2	18	0.04	4.00	0.1	2
Class Room -2	LED Tube	1	1	18	0.02	4.00	0.1	1
Girls Common Room	LED Tube	2	2	18	0.04	3.00	0.1	1
Staff Room	LED Tube	2	2	18	0.04	3.00	0.1	1
Class Room- 3	LED Tube	2	2	18	0.04	4.00	0.1	2
Gen Office	LED Tube	3	3	18	0.05	2.00	0.1	1
Passage	LED Tube	3	3	18	0.05	2.00	0.1	1
Power Room	LED Tube	4	4	18	0.07	4.00	0.3	4
Principal Cabin	Ceiling fan	1	1	75	0.08	8.00	0.6	16
Exam Section	Ceiling fan	1	1	75	0.08	7.00	0.5	13
Account Section	Ceiling fan	1	1	75	0.08	7.00	0.5	13
Computer Lab	Ceiling fan	1	1	75	0.08	8.00	0.6	16
Class Room-1	Ceiling fan	1	1	75	0.08	8.00	0.6	16
Redding Room	Ceiling fan	1	1	75	0.08	4.00	0.3	4
Library	Ceiling fan	2	2	75	0.15	8.00	1.2	32
P' Analysis Lab	Ceiling fan	2	2	75	0.15	8.00	1.2	32
P' Celtics	Ceiling fan	2	2	75	0.15	8.00	1.2	32
P' Chemistry	Ceiling fan	2	2	75	0.15	8.00	1.2	32
Machine Room	Ceiling fan	1	1	75	0.08	4.00	0.3	4
Class Room-II	Ceiling fan	2	2	75	0.15	4.00	0.6	8
Girls Common Room	Ceiling fan	1	1	75	0.08	3.00	0.2	3
Staff Room	Ceiling fan	2	2	75	0.15	3.00	0.5	5
Class Room-III	Ceiling fan	2	2	75	0.15	4.00	0.6	7
P' Colony Lab	Ceiling fan	2	2	75	0.15	8.00	1.2	32
P' Cognosy	Ceiling fan	2	2	75	0.15	8.00	1.2	32
Seminar Hall	Ceiling fan	5	5	75	0.38	8.00	3.0	80

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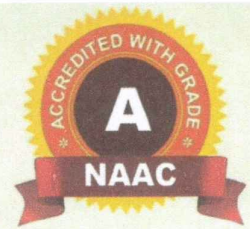
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Total					3.12	19.05	447
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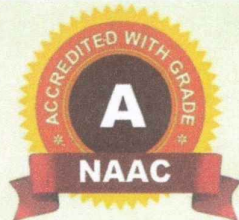
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5.4 Energy Saving Measure 2 – Replacement of conventional ceiling fans with energy efficient ceiling fans

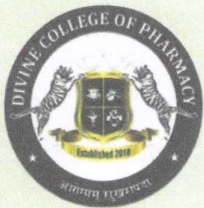
It has been observed that conventional ceilings fans are used at different areas in college. It is recommended to replace existing 75W ceiling fans with 40W energy efficient fans. Below table shows the estimated energy and monetary saving along with payback period

Location	Fan Type	Qty	Watt	kW Load	Hours of Usage	No. of Days in Month	Hrs./Month	Daily (kWh)	Monthly (kWh)	New Wattage	New kW	New Monthly kWh	Energy Saving in kWh	Monetary saving in Rs	Investment	Payback period in months
Principal Cabin	Ceiling fan	1	75	0.08	8	26.5	212	0.6	16	40	0.04	8.5	7.4	59	3500	59
Exam Section	Ceiling fan	1	75	0.08	7	25.5	179	0.5	13	40	0.04	7.1	6.2	50	3500	70
Account Section	Ceiling fan	1	75	0.08	7	25.5	179	0.5	13	40	0.04	7.1	6.2	50	3500	70
Computer Lab	Ceiling fan	1	75	0.08	8	26.5	212	0.6	16	40	0.04	8.5	7.4	59	3500	59
Class Room-1	Ceiling fan	1	75	0.08	8	26.5	212	0.6	16	40	0.04	8.5	7.4	59	3500	59
Redding Room	Ceiling fan	1	75	0.08	4	13.5	54	0.3	4	40	0.04	2.2	1.9	15	3500	231
Library	Ceiling fan	2	75	0.15	8	26.5	212	1.2	32	40	0.08	17	14.8	119	7000	59
P' Analysis Lab	Ceiling fan	2	75	0.15	8	26.5	212	1.2	32	40	0.08	17	14.8	119	7000	59
P' Cellics	Ceiling fan	2	75	0.15	8	26.5	212	1.2	32	40	0.08	17	14.8	119	7000	59
P' Chemistry	Ceiling fan	2	75	0.15	8	26.5	212	1.2	32	40	0.08	17	14.8	119	7000	59
Machine Room	Ceiling fan	1	75	0.08	4	13.5	54	0.3	4	40	0.04	2.2	1.9	15	3500	231
Class Room-II	Ceiling fan	2	75	0.15	4	13.5	54	0.6	8	40	0.08	4.3	3.8	30	7000	231
Girls Common Room	Ceiling fan	1	75	0.08	3	12	36	0.2	3	40	0.04	1.4	1.3	10	3500	347
Staff Room	Ceiling fan	2	75	0.15	3	12	36	0.5	5	40	0.08	2.9	2.5	20	7000	347
Class Room-III	Ceiling fan	2	75	0.15	4	12	48	0.6	7	40	0.08	3.8	3.4	27	7000	260
P' Cology Lab	Ceiling fan	2	75	0.15	8	26.5	212	1.2	32	40	0.08	17	14.8	119	7000	59

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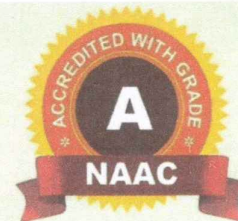
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P' Cognosy	Ceiling fan	2	75	0.15	8	26.5	212	1.2	32	40	0.08	17	14.8	119	7000	59
Seminar Hall	Ceiling fan	5	75	0.38	8	26.5	212	3.0	80	40	0.20	42.4	37.1	297	17500	59
		31		2.33				16	376	720	1	201	176	1,405	108,500	77

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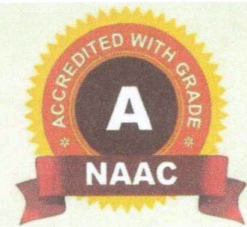
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5.5 Observation & Remark

Sr.No	Area	Observation	Remark
1	Ceiling Fans	<p>At present, conventional ceiling fans of 75 W are installed in Class Room, Tutorial Room, and Staff Room.</p> <p>There is total 31 no. of ceilings fans are installed</p> <p>Total ceiling fan load is 2.33 kW</p>	<p>New energy efficient fans are available in the market which deliver same air volume at less power consumption</p> <p>It is recommended to replace existing 75 W ceiling fans with new energy efficient 40W BLDC fan</p> <p>Estimated new load of fan is 1 kW</p> <p>Estimated annual energy saving is 176 units</p> <p>Estimated annual carbon emission reduction is 1.7 Tones</p> <p>Estimated annual monetary saving is Rs.0.17 Lakh</p> <p>Estimated investment is Rs.1.08 Lakh</p> <p>Payback period is 77 months</p>




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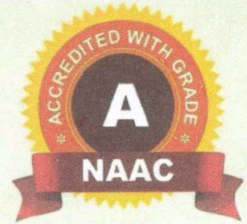
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Fan Recommendation 1

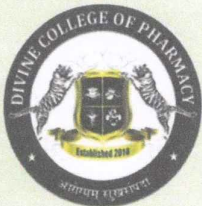
Replace existing 75-watt conventional ceiling fans with 40-watt energy efficient fans

Parameter	Unit	Value
Present fan type		Conventional ceiling fan
Present wattage of ceiling fans	watt	75
Total no.of fans installed	Nos.	31
Present load of ceiling fans	kW	2.33
Present monthly energy consumption of ceiling fans	kWh	376.3
Recommended fan type		Energy Efficient BLDC fan
New Estimated wattage of fan	watt	40
Estimated load of ceiling fan	kW	1
Power saving	kW	1.09
% Savings	%	47%
New Estimated monthly energy consumption	kWh	201
Estimated annual energy savings	kWh	2107
Estimated annual carbon emission reduction	Tons	1.7
Estimated annual monetary savings	Rs	16,857.1
Estimated investment for 1 fan	Rs	3500
Estimated total investment	Rs	108,500
Payback period	Months	77



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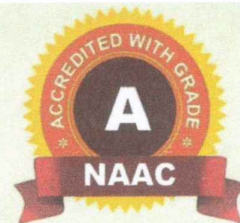
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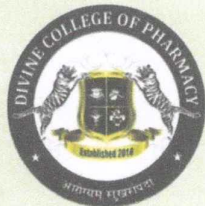
5.6 Performance Assessment of Lighting load

Building - Location	Light Type	Qty	Used Qty	Wattage	Lighting Load Kw	Hours of usage	No of Days in a month	Hrs./M	Daily consumption(kWh)	Monthly consumption(kWh)
Ground floor-Principal Cabin	LED Tube	3	3	18	0.05	8.00	26.5	212	0.4	11
Ground floor-Exam	LED Tube	1	1	18	0.02	7.00	26.5	186	0.1	3
Ground floor-Account	LED Tube	1	1	18	0.02	7.00	26.5	186	0.1	3
Ground floor-Computer Lab	LED Tube	2	2	18	0.04	8.00	26.5	212	0.3	8
Ground floor-Class Room -1	LED Tube	2	2	18	0.04	8.00	26.5	212	0.3	8
Ground floor-Reading Room	LED Tube	2	2	18	0.04	4.00	26.5	106	0.1	4
Ground floor-Library	LED Tube	3	3	18	0.05	8.00	26.5	212	0.4	11
Ground floor-Store	LED Tube	2	2	18	0.04	8.00	26.5	212	0.3	8
First Floor-P' Analysis Lab	LED Tube	3	3	18	0.05	2.00	6.0	12	0.1	1
First Floor-P' Celtics	LED Tube	3	3	18	0.05	2.00	6.0	12	0.1	1
First Floor-P' Chemistry	LED Tube	3	3	18	0.05	2.00	6.0	12	0.1	1
Ground floor-Machine Room	LED Tube	2	2	18	0.04	4.00	13.5	54	0.1	2
Ground floor-Class Room -2	LED Tube	1	1	18	0.02	4.00	13.5	54	0.1	1
Ground floor-Girls Common Room	LED Tube	2	2	18	0.04	3.00	12.0	36	0.1	1
Ground floor-Staff Room	LED Tube	2	2	18	0.04	3.00	12.0	36	0.1	1
Ground floor-Class Room- 3	LED Tube	2	2	18	0.04	4.00	12.0	48	0.1	2
First Floor-Gen Office	LED Tube	3	3	18	0.05	2.00	6.0	12	0.1	1
First Floor-Passage	LED Tube	3	3	18	0.05	2.00	6.0	12	0.1	1
First Floor-Power Room	LED Tube	4	4	18	0.07	4.00	14.0	56	0.3	4
		44	44		0.79				4	71

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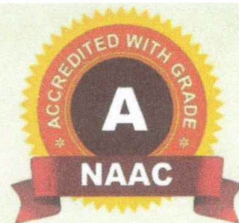
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Requirements of NAAC

5.7 Alternative Energy Initiative

Percentage of power requirement met by renewable energy sources

= (Power requirement met by renewable energy sources / Total power requirement) X 100

= (0/0) X 100

= 0%


5.8 Percentage of lighting power requirement met through LED bulbs

= (Lighting power requirement met through LED bulbs / Total lighting power requirement) X 100

= (0.79/0.79)

= 100%




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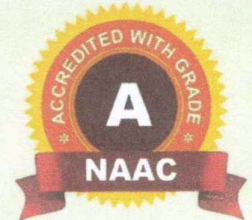
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6 Green Audit

Green audit was initiated with the beginning of 1970s with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. It exposes the authenticity of the proclamations made by multinational companies, armies and national governments with the concern of health issues as the consequences of environmental pollution. It is the duty of organizations to carry out the Green Audits of their ongoing processes for various reasons such as; to make sure whether they are performing in accordance with relevant rules and regulations, to improve the procedures and ability of materials, to analyze the potential duties and to determine a way which can lower the cost and add to the revenue. Through Green Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out Green Audit. Some of the incidents like Bhopal Gas Tragedy (Bhopal; 1984), Chernobyl Catastrophe (Ukraine; 1986) and Exxon-Valdez Oil Spill (Alaska; 1989) have cautioned the industries that setting corporate strategies for environmental security elements have no meaning until they are implemented.

Green Audit is assigned to the Criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India that declares the institutions as Grade a, Grade B or Grade C according to the scores assigned at the time of accreditation.

The intention of organizing Green Audit is to upgrade the environment condition in and around the institutes, colleges, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmentally friendly institute.

6.1 Goals of Green Audit

- The objective of carrying out Green Audit is securing the environment and cut down the threats posed to human health.
- To make sure that rules and regulations are taken care of
- To avoid the interruptions in environment that are more difficult to handle and their correction requires high cost.
- To suggest the best protocols for adding to sustainable development



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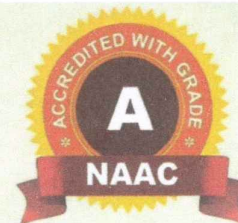
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6.2 Benefits of Green Audit

- It would help to shield the environment
- Recognize the cost saving methods through waste minimizing and managing
- Point out the prevailing and forthcoming complications
- Authenticate conformity with the implemented laws
- Empower the organizations to frame a better environmental performance
- It portrays a good image of a company which helps building better relationships with the group of stakeholders
- Enhance the alertness for environmental guidelines and duties

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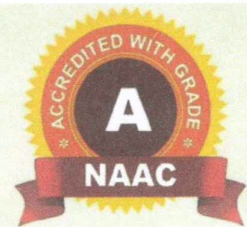
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7 Initiatives by College towards Sustainable Environment


7.1 Tree Plantation

Tree-planting is the process of transplanting tree seedlings, generally for forestry, land reclamation, or landscaping purpose. It differs from the transplantation of larger trees in arboriculture, and from the lower cost but slower and less reliable distribution of tree seeds.



Sanjay Photo, Satana




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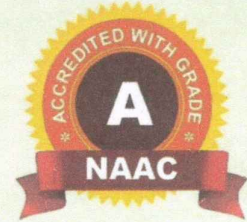
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Sanjay Photo, Satana

7.2 Use of Solar PV System for Power Generation

Solar Water Heating System

Solar water heaters are installed to fulfil the demand of hot water from hostels.

Total capacity: 500 litres

- I) System 1: Capacity: 500 litres, installation year 2016

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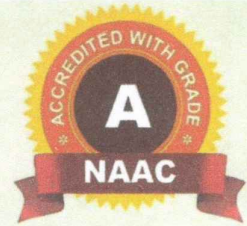
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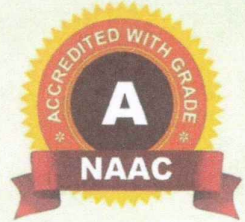
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7.3 Vermicomposting Plant

College has taken initiative to compost the daily solid waste by means of vermicomposting plant.


The compost generated through vermicomposting can be used as a natural fertilizer for plants and gardens, which helps to improve soil quality and support healthy plant growth. It's great to hear that your college is using the compost in the campus garden area and distributing it to nearby farmers, as this promotes sustainability and helps to reduce waste.

Following is the details of vermicomposting plant.



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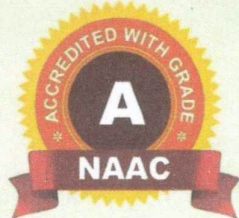
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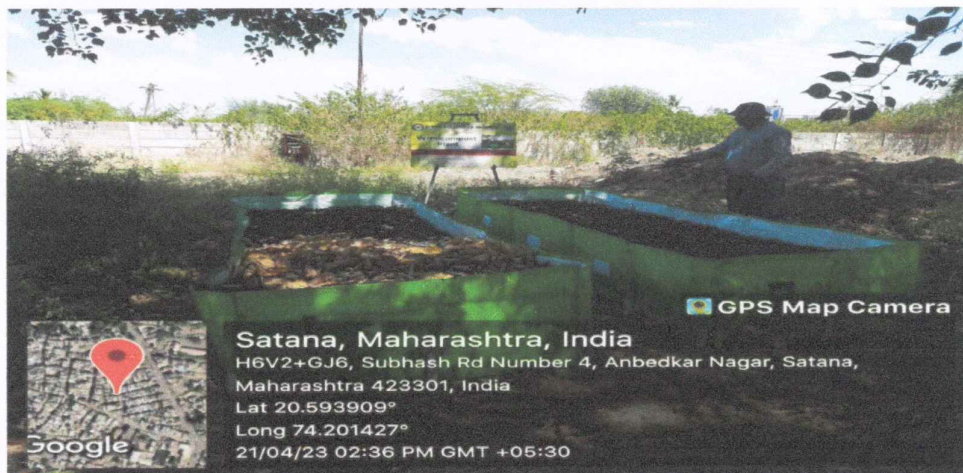
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8 Liquid Waste Management

Rainwater Harvesting System

Rain water Harvesting System ;

Rainwater from rooftops of All Academic Building is down through rainwater down pipes (PVC) & then conveyed through pipes to Recharge Pits.

Rainwater collected in these Recharge Pits gets permeated in lower strata thereby increasing groundwater table & results in recharging of bore well & open well.




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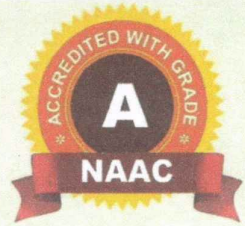
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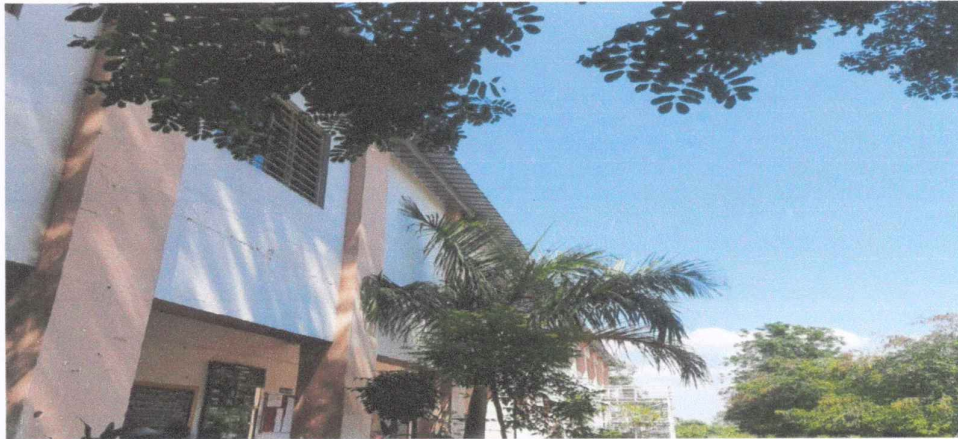
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9 No Vehicle Day

Divine College of Pharmacy, Satana, Nashik started seeing a rise in pollution in their vicinity and only then they realized it is high time they take a step towards the problem. On that note, the college recently celebrated no vehicle day in the campus wherein no bikes, cars or any polluting vehicle was allowed. All the faculty and students were told to use bicycles to mark the day. To maintain an eco-friendly environment, it hereby requested to all members of the college fraternity, not to bring their vehicles inside the college campus on 30 of March 2022. Being their first one-of-a-kind initiative, everyone from the college showed interest; from students, staff and teachers, everyone gave thumbs up to this cause. Under the program of green environment initiated by the government, they college decided to take this step. The authorities said that going forward; these types of programs will definitely be contributing to nature.

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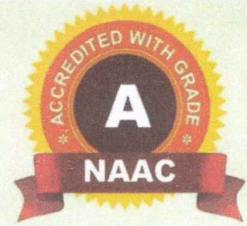
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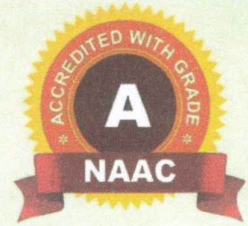
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—NO VEHICLE DAY—



For all Faculty and Students
“Avoid Vehicles for small distances”
“Use Public transport wherever possible”
“Go Green”



“Join hands for great initiative on 30 March 2022, Wednesday”

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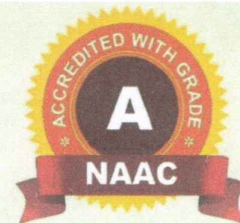
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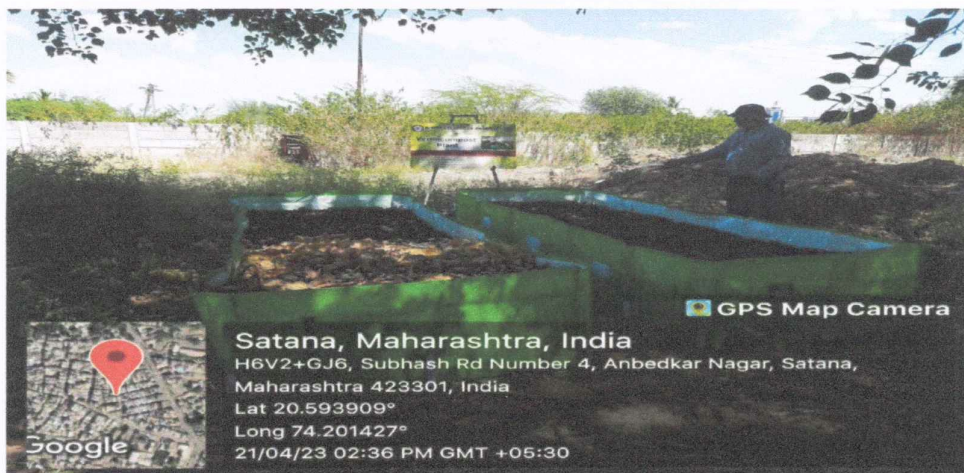
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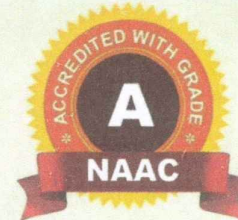
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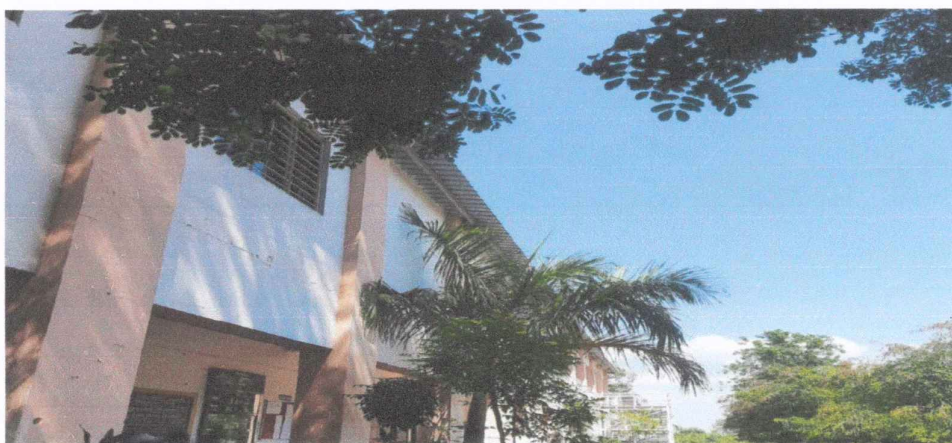
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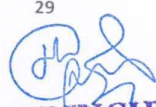


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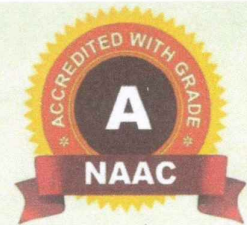
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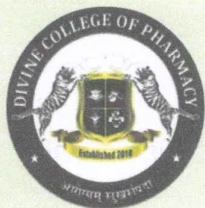
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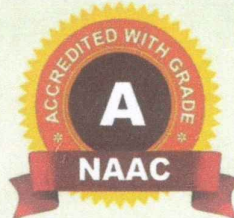
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