

Rayat Shikshan Sanstha's  
**Rajarshi Chhatrapati Shahu College Kolhapur**

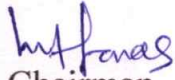
Criteria No – VII Institutional Values and Best Practices

**ENVIRONMENTAL CONSCIOUSNESS AND SUSTAINABILITY**


**7.1.6 Quality Audits on Environment and Energy**

**INDEX**  
**7.1.6**

Sr. No	Activity/Initiatives/Courses
1	Green and Environmental Audit
2	Energy Audit
3	Audit Certificates

  
Chairman  
Criterion VII



  
Principal,  
Rajarshi Chh. Shahu College,  
Kolhapur.

**Green And Environmental Audit  
Report (2021-2022)**

**Rayat Shikshan Sanstha's  
Rajarshi Chhatrapati Shahu College, Kolhapur  
Tal-Karveer, Dist-Kolhapur  
Maharashtra**



**Prepared by  
Ashokrao mane Group of Institutions**



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## **I. INTRODUCTION**

It was founded in 1961 to be the Rajarshi Chhatrapati Shahu College. As a reputable institution, this College has made a name for itself by offering students from underprivileged backgrounds and slum areas a top-notch education in the humanities, sciences, and business. Research and athletics have a long history at the campus. The college has carried out a variety of activities on campus, including campus interviews, NSS competitions, NCC events, sporting events, celebrations of major holidays, lead college programmes, and student-oriented activities.

### **1.1 Infrastructure**

From Kolhapur's main bus stop, the college is located on the north-east side. The college is located on a campus that is 9.22 acres in size. 6808.20 square metres are built-up in total. The physical infrastructure of the college is adequate for the administration and academic programmes that are now offered. Standard furnishings and fittings are included in every classroom. Every building has sufficient basic utilities, such as drinking water, on the second story. There are 44,279 books total in the campus library, including novels, journals, reference books, and textbooks. It contains a reading room where you may find magazines and newspapers. Through N.S.S. and NCC, the College instils social responsibility among its pupils. Students who are interested are trained by the N.C.C. Unit. Various techniques for self-defense and emergency community assistance are being taught by a civil defence squad. The institution contains a multipurpose hall, a computer lab, a gym, and a parking garage in addition to a library and classrooms.

### **1.2 Green and environmental Audit: An overview**

Through their work in both teaching and research, educational institutions are crucial to the ongoing development of human resources worldwide. The goal of the many actions educational institutions carry out is to spread



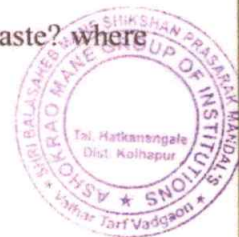


knowledge among the various societal levels. Much like educational institutions, environmental conservation and pollution management are topics that are addressed. To pinpoint the environment-related problem, many evolutionary approaches are applied. These include carbon footprint mapping, environmental impact assessments, social impact assessments, and green audits, among others.

"Green audit is a method to highlight common practises adopted and followed by company in terms of its impact on environment." Environmentally damaging behaviours that are the root of and accountable for environmental harm are also a focus of green audits. Green audits highlight an organization's strengths and weaknesses in terms of environmental conservation and protection. Furthermore, it identifies and draws attention to improper methods of using natural resources. A green audit demonstrates the best way to maintain healthy practises, introduce new, creative systems for resource optimization, and reduce waste production. In terms of social, economic, and environmental viewpoints, it aids in the preservation and protection of the environment, natural resources, and the campus of the leading university.

### **1.3 Need of Green and environmental auditing:**

The process of evaluating institutionally approved processes to see if they are environmentally friendly and sustainable is known as "green audits." Natural resource management is traditionally emphasised in Indian culture. But as time goes on, the environment and civilization as a whole are threatened by the unchecked excessive use of resources like energy, water, and chemicals. Checking whether our established behaviours are using more resources than necessary is now necessary. How carefully are we processing the waste? where our usage of natural resources is under our control.



The use of natural resources can be best maximised with the help of green audit, which demonstrates all such measures. It is essential to examine the accepted practises and replace them with green, clean ones in the age of global warming, climate change, pollution, and resource depletion. An approach for it is green audit. Additionally, it raises acceptance of green practises and a general understanding of environmental conservation among institution's staff members.

#### **1.4 Goals of Green and environmental audit:**

With the following objectives, the college undertook a green audit.

1. Gathering baseline information on environmental characteristics and taking action before an issue becomes a problem.
2. Determine the green practises' points of strength and weakness.
3. Conduct a poll to gather baseline data regarding actual green behaviours.
4. Identify the challenges facing green practise and offer solutions.
5. Examine the facilities for various waste management methods.
6. With training, raise environmental awareness across the university.

#### **1.5 Objectives of Green and environmental audit:**

To compile basic data regarding existing behaviours that may have an adverse effect on the environment

2. To identify major environmental problems.
3. Establish a campus-wide objective, vision, and goal for environmental protection.



### 3. OVERVIEW OF GREEN AUDIT

#### Audit Criteria

- 3.1 Green Cover
- 3.2 Waste Management
- 3.3 Water Conservation
- 3.4 Health and Hygiene
- 3.5 Training and Awareness
- 3.6 Earn and learn scheme
- 3.7 Celebration of No Vehicle Day

#### 3.1 Green Cover

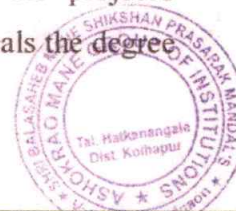
Through the NSS, NCC, and Botany department, the college regularly organizes tree-planting initiatives as part of its goal. The campus of the college serves as a gauge of how knowledgeable the faculty and students are about floral biodiversity. Students from the Department of Botany counted the trees and bushes on the campus grounds. With the assistance of the Department of Botany, a project was started on identifying the flora on campus. Books on animal and plant identification are always on hand at the college. Records of the diversity of the flora and fauna are kept and were accessible during the audit.

- **List of Flora**

Department of Botany conducted a project on plant identification on campus. Also provides a list of floral biodiversity is provided.

- **Plantation of Rare Endangered Species**

Under the "Improvement of One Time Infrastructural Facilities in Botanical Garden" project, the college created a unique endangered species garden. Within the college grounds, space has been set aside for the project's development of a medicinal plant garden. The campus setting reveals the degree





to which the college's faculty and students are knowledgeable of floral biodiversity.





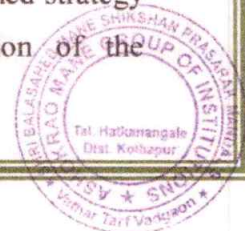
- **Drinking water system for birds and animals**

In order to preserve biodiversity, the college has created separate drinking water systems for birds and other animals. The botanical garden has a specific water bowl. The availability of water and a secure location make this practise particularly effective, increasing the number of birds and other animals. We are conscious of the risks that wifi systems provide to these birds, therefore we outlawed wifi systems and provided internet access to every department in order to preserve the biodiversity of birds.

### **3.2Waste Management**

A pressing challenge nowadays is the handling of solid waste. Solid waste is produced at an extremely high pace, and management technology is too good. An ongoing problem that poses risks to the environment and to human health is the improper treatment of solid waste. In order to lighten the load on the waste management system, proper management of solid waste is required. This audit's objective is to ascertain the campus's present solid waste generation management practises. In the campus, paper waste is one of the main solid wastes produced.

Most departments, including the office and library, make significant contributions to the production of paper trash. Plastic is the second most common type of solid trash produced on campus. One-sided paper is used by office personnel for printing and writing. The canteen, hostels, and guest houses generate the majority of the biodegradable waste on campus. Although less of a contributor, glass garbage nevertheless contributes to the formation of solid waste. Bottles make up the majority of the glass trash produced by laboratories; bottles are frequently used again to store different chemicals. Thrown out with solid debris is additional glass waste. The college sells stored newspapers and waste papers to a scrap dealer once a year as part of a well-established strategy for recycling and reusing resources, such as paper. A portion of the



biodegradable garbage from the canteen is treated with the vermicomposting method after being collected. E-waste was observed to be collected but required for recycling disposal. The peon stores and then collects garbage like paper waste and technological accessories.





- **Vermi composting Unit**

The college operates a small vermin composting plant to create vermicompost. The fertiliser is organic and is used in organic farming. It inspires the notion of creating this fertiliser from leftover food. In order to help the students, the college built a vermi composting unit that measures 12 X 2.5 X 2.5 feet in the college botanical garden, where the students can visit and see how it works. Today, having a garden surrounding the house is a notion, and the majority of college students come from farming families. Vermicomposting is quite beneficial for both objectives.

### **3.3 Water Conservation**

An on-site walk through survey and evaluation were done for the water audit in order to analyse water use efficiency and formulate suggestions for increasing water use efficiency. Finding opportunities to improve water use efficiency is the main goal of a water audit. All components of the flow from the distribution system into the consumer's properties are tracked, evaluated, and verified as part of the water audit process. The amount and direction of water used for domestic, laboratory, drinking, gardening, sanitary, and landscaping operations are examined by a campus-wide water audit, on the other hand. Drip irrigation is used to water the plants. The swimming pool's water was recycled for the nursery that Samajik Vanikaran Vibhag, Kolhapur, had built as part of an agreement with the botany department on the college campus.





On campus, drinking water is available in easily accessible locations. Drinking water is tested for the water parameters in accordance with the established BIS drinking water standards. For leaks and spills, toilets were examined. Random inspections of these restrooms revealed that they were kept free of spills and leaks. Although it is greatly applauded that the college has started on-site rain water harvesting. On campus and in public areas, the NSS organises water conservation campaigns. By educating students and staff members and doing routine leak checks, the college was inspired to cut water consumption. The college encouraged recycling and reusing washwater from washbasins for gardening as a future goal. The college is also preparing for the collection of rainwater.

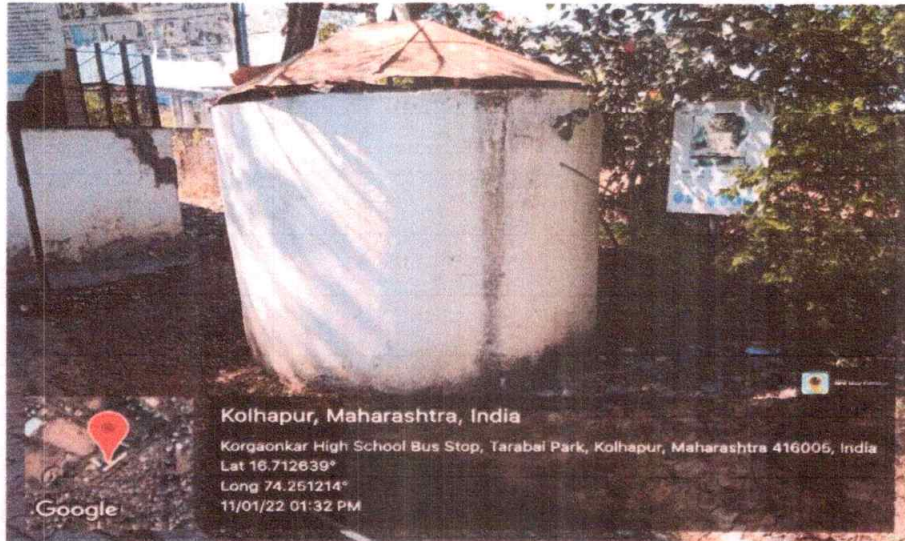
- **Rain water harvesting details with harvesting capacity**

The site of R. C. Shahu College spans 9.5 acres, and its roof surface area is 2330.47 square metres. The college has a total population of roughly 2000 people, including students, faculty, staff, and regular visitors. The average person needs to drink 2.5 litres of water every day, according to the World



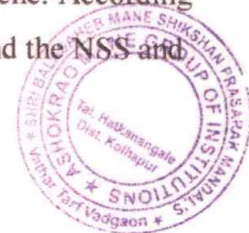


Health Organization. According to analysis, 5000 litres of water must be used daily for drinking. An estimated 1606608.78 litres of rooftop rainwater could be collected.

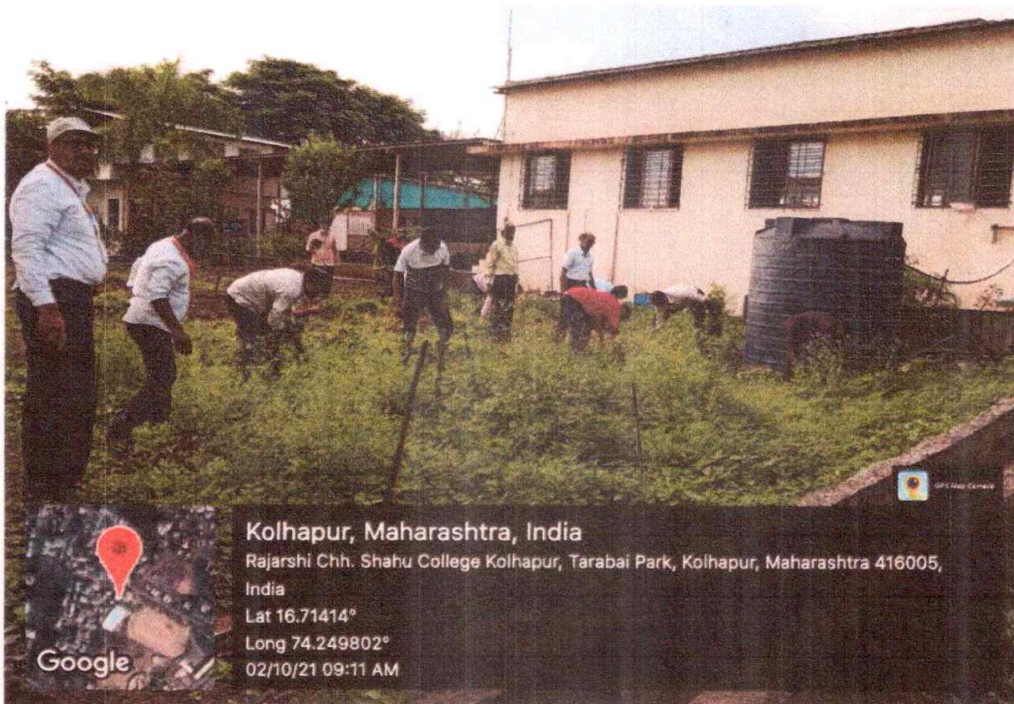


### 3.4 Health and Hygiene

By keeping the campus clean, the college inspired to promote Swachh Bharat Abhiyaan. The emphasis on housekeeping is strong. The cleanliness, spills, and leaks of the restrooms were examined. These restrooms were randomly selected for inspection, and it was discovered that they were kept clean and that the students were content with the degree of hygiene. According to records, sweepers frequently clean the floors and restrooms, and the NSS and







- **Campus as Oxygen Park**

By placing the greatest amount of its land under vegetation, or beneath plantations, the college has become an oxygen park for people, animals, and plants alike. The fact that a college campus offers clean, healthy air makes it function as an oxygen park. Despite the circumstances, locals like riding on campus in the morning and evening.

- **Illumination and ventilation**

A college building is larger, and the classrooms and other spaces are well ventilated. Natural ventilation and lighting are too wonderful. Artificial ventilation and lighting are not required.

- **Cleanliness Practices**

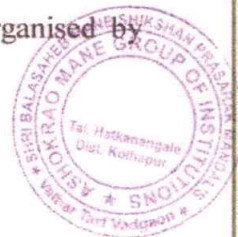
College organises a sanitation drive to educate students and staff about good hygiene habits and to expose them to volunteer work.

- **Sanitation drive & Thermal Screening**

Students can often sterilise college campuses with hand sanitizer that contains 70% alcohol and 1% sodium hypochlorite, which helps to stop the spread of the COVID-19 virus. Additionally, colleges offer thermal screening equipment that can be used to measure temperature.

### **3.6 Training and Awareness**

Cultural committee students perform plays on the streets about various environmental challenges. The Swachh Bharat Abhiyaan and awareness rally are aggressively promoted by the NSS and NCC wings. The lectures on experts in the fields of the environment and social responsibilities are organised by Time to Time College.





### 3.7 Earn and learn scheme

It aids kids in developing self-reliance. The college's "earn while you learn" programme allows underprivileged students the opportunity to work and earn money. For those who cannot enrol in school because of financial constraints, the programme is incredibly beneficial and useful.

### 3.8 Celebration of No Vehicle Day

Every month on the first Saturday, colleges celebrate "No Vehicle Day," which serves to reduce environmental pollution.



### Recommendations:

1. To ensure that the generated trash is measured, monitored, and recorded routinely and that information is made available to administrations, a frequent visit should be performed.
2. Expand the number of awareness campaigns among students and the general public.



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## ENERGY AUDIT REPORT

Client Name	<b>Rajarshi Chhatrapati Shahu college Kolhapur, Taluka- Karvir, Dist.- Kolhapur. Maharashtra, India</b>
Project Name	<b>Rajarshi Chhatrapati Shahu college Kolhapur, Taluka- Karvir, Dist.- Kolhapur. Maharashtra, India</b>
Date	Year 2021-22
Submitted by	<b>Ashokrao Mane Group of Institutions</b> Vathar Tarf Vadgaon, Tal- Hatkanangale, Dist.-Kolhapur (Maharashtra state)



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## ACKNOWLEDGEMENT

We appreciate the interest and participation of Honorable Management and Principal and Faculty in carrying out the energy audit at **Rajarshi Chhatrapati Shahu college Kolhapur**. Our special thanks to Technicians and Staff involved for college who have extended their co-operation and courtesy to the energy audit team during the audit.



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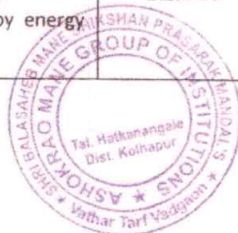
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1.0 EXECUTIVE SUMMARY (Lighting Load):

Recommendations	Monthly present expenditure in Rs.	Investment for the saving of expenditure in Rs.	Savings per month in Rs.	Payback period in years.
<b>Gymkhana</b> Replace 80W old fan and 40W tub light by energy efficient fan(09no) and tub light (05)	Rs.2484	Rs.25500	Cost of energy Rs.1094 Saving=Rs.2484--Rs.1094 = Rs.1390	1.8yrs..
<b>Mathematics Department</b> Replace 80W old fan and 40W tub light by energy efficient fan (3 no) and tub light (04)	Rs.1080	Rs.10200	Cost of energy Rs.478 Saving=Rs.1080 -Rs. 478 = Rs.602	1.4yrs..
<b>Zoology Department</b> Replace 80W old fan and 40W tub light by energy efficient fan (3 no) and tub light (05)	Rs.1188	Rs.10500	Cost of energy Rs.527 Saving=Rs.1188-Rs. 527 = Rs.661	1.3yrs..
<b>Botany Department</b> Replace 80W old fan and 40W tub light by energy efficient fan (2 no) and tub light (05)	Rs.972	Rs.7500	Cost of energy Rs.432 Saving=Rs.972 -Rs. 432 = Rs.540	1.1yrs..
<b>Statistics Department</b> Replace 80W old fan and 40W tub light by energy efficient fan (5 no) and tub light (08)	Rs.1944	Rs.17400	Cost of energy Rs.861.3 Saving=Rs.1944 -Rs. 861.3 = Rs.1082.70	1.4yrs..
<b>Microbiology Department</b> Replace 80W old fan and 40W tub light by energy efficient fan (2 no) and tub light (04)	Rs.864	Rs.7200	Cost of energy Rs.383.4 Saving=Rs.864 -Rs. 383.4 = Rs.480.60	1.3yrs..
<b>Physics Lab-1</b> Replace 80W old fan and 40W tub light by energy efficient fan(01no) and tub light (04)	Rs.648	Rs.4200	Cost of energy Rs.289 Saving=Rs.648 -Rs. 289 = Rs.359	1 yrs..
<b>Physics Lab-2</b> Replace 80W old fan and 40W tub light by energy efficient fan(01no) and tub light (04)	Rs.648	Rs.4200	Cost of energy Rs.289 Saving=Rs.648 -Rs. 289 = Rs.359	1 yrs..
<b>Record room</b> Replace 40W old tub light by energy efficient tub light (02)	Rs.216	Rs.600	Cost of energy Rs.97.2 Saving=Rs.216 -Rs.97.2 = Rs.118.80	0.5yrs..
<b>Wash room (Ladies)</b> Replace 40W old tub light by energy efficient tub light (02)	Rs.216	Rs.600	Cost of energy Rs.97.2 Saving=Rs.216 -Rs.97.2 = Rs.118.80	0.5yrs..
<b>Wash room (Gents)</b> Replace 40W old tub light by energy efficient tub light (02)	Rs.216	Rs.600	Cost of energy Rs.97.2 Saving=Rs.216 -Rs. = Rs.118.80	0.5yrs..
<b>Lab Porch (2<sup>nd</sup> Floor)</b> Replace 40W old tub light by energy efficient tub light (02)	Rs.216	Rs.600	Cost of energy Rs.97.2 Saving=Rs.216 -Rs. = Rs.118.80	0.5yrs..





<b>Room No-01 (Sociology Department)</b> Replace 80W old fan and 40W tub light by energy efficient fan(01no) and tub light (01 no)	<b>Rs.324</b>	<b>Rs.3300</b>	Cost of energy Rs.143.1 Saving=Rs.324 -Rs. 143.1 = Rs.180.90	1.5yrs..
<b>Room no 200 to 215</b> Replace 80W old fan and 40W tub light by energy efficient fan (32 no) and tub light (33)	<b>Rs.10476</b>	<b>Rs.105900</b>	Cost of energy Rs.4627.8 Saving=Rs.10476 -Rs.4627.8 = Rs.5848.20	1.5yrs..
<b>Porch (1<sup>st</sup> Floor)</b> Replace 40W old tub light by energy efficient tub light (02)	<b>Rs.216</b>	<b>Rs.600</b>	Cost of energy Rs.97.2 Saving=Rs.216 -Rs. 97.2 = Rs.118.80	0.5yrs..
<b>Room no 105 to 111</b> Replace 80W old fan by energy efficient fan (16no)	<b>Rs.3456</b>	<b>Rs.48000</b>	Cost of energy Rs.1512 Saving=Rs.3456 -Rs.1512 = Rs.1944	2. yrs..
<b>Office</b> Replace 80W old fan and 40W tub light by energy efficient fan (06 no) and tub light (01 no)	<b>Rs.1404</b>	<b>Rs.18300</b>	Cost of energy Rs.615.1 Saving=Rs.1404 -Rs. 615.1 = Rs.788.90	2 yrs..
<b>Principal cabin</b> Replace 80W old fan and 40W tub light by energy efficient fan (02 no) and tub light (02)	<b>Rs.648</b>	<b>Rs.6600</b>	Cost of energy Rs.286.2 Saving=Rs.648 -Rs.286.2 = Rs.361.80	1.6yrs..
<b>IQAC Room</b> Replace 80W old fan and 40W tub light by energy efficient fan (2 no) and tub light (02)	<b>Rs.648</b>	<b>Rs.6600</b>	Cost of energy Rs.286.2 Saving=Rs.648 -Rs. 286.2 = Rs.361.80	1.6yrs..
<b>Ground Floor</b> Replace 40W old tub light by energy efficient tub light (05 no)	<b>Rs.540</b>	<b>Rs.300</b>	Cost of energy Rs.243 Saving=Rs.540 -Rs.243 = Rs.297	0.5yrs..
<b>Room no 100 to 101</b> Replace 80W old fan and 40W tub light by energy efficient fan (08 no) and tub light (01 no)	<b>Rs.1836</b>	<b>Rs.24300</b>	Cost of energy Rs.804.6 Saving=Rs.1836 -Rs.804.6 = Rs.1031.40	1.11yrs..
<b>Marathi Department</b> Replace 80W old fan and 40W tub light by energy efficient fan (02 no) and tub light (01 no)	<b>Rs.540</b>	<b>Rs.6300</b>	Cost of energy Rs.237.6 Saving=Rs.540 -Rs.237.6 = Rs.297	1.1yrs..
<b>History Department</b> Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (03)	<b>Rs.540</b>	<b>Rs.3900</b>	Cost of energy Rs.237.6 Saving=Rs.540 -Rs.237.6 = Rs.297	1.1 yrs..
<b>Economic Department</b> Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (02)	<b>Rs.432</b>	<b>Rs.3600</b>	Cost of energy Rs.191.7 Saving=Rs.432 -Rs. 191.7 = Rs.240.30	1.3 yrs..
<b>Hindi Department</b> Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (02)	<b>Rs.432</b>	<b>Rs.3600</b>	Cost of energy Rs.191.7 Saving=Rs.432 -Rs. 191.7 = Rs.240.30	1.3 yrs..
<b>NCC Department</b> Replace 80W old fan and 40W tub light by energy efficient fan (01 no) and tub light (02)	<b>Rs.432</b>	<b>Rs.3600</b>	Cost of energy Rs.191. Saving=Rs.432 -Rs.191 = Rs.240.30	1.3 yrs..



<b>Physical Education Department</b> Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (02)	<b>Rs.432</b>	<b>Rs.3600</b>	Cost of energy Rs.191 Saving=Rs.432 -Rs.191 = Rs.240.30	1.3 yrs..
<b>Library</b> Replace 80W old fan by energy efficient fan (12no)	<b>Rs.2592</b>	<b>Rs.15000</b>	Cost of energy Rs.1134 Saving=Rs.2592 -Rs. 1134 = Rs.1458	1 yrs..
<b>Room No-102</b> Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (02)	<b>Rs.432</b>	<b>Rs.3600</b>	Cost of energy Rs.191.7 Saving=Rs.432 -Rs.191.7 = Rs.240.3	1.3 yrs..
<b>NSS Department</b> Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (02)	<b>Rs.432</b>	<b>Rs.3600</b>	Cost of energy Rs.191.7 Saving=Rs.432 -Rs.191.7 = Rs.240.3	1.3 yrs..
<b>Room No-104</b> Replace 80W old fan and 40W tub light by energy efficient fan (03 no) and tub light (02)	<b>Rs.864</b>	<b>Rs.9600</b>	Cost of energy Rs.380.7 Saving=Rs.864 -Rs.380.7 = Rs.483.30	1.6 yrs..
<b>Commerce Department</b> Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (01)	<b>Rs.324</b>	<b>Rs.3300</b>	Cost of energy Rs.143.1 Saving=Rs.324 -Rs.143.1 = Rs.180.90	1.5 yrs..
<b>Room No-106</b> Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (02)	<b>Rs.432</b>	<b>Rs.3600</b>	Cost of energy Rs.191.7 Saving=Rs.432 -Rs.191.7 = Rs.240.3	1.3 yrs..
<b>Room No-105</b> Replace 80W old fan and 40W tub light by energy efficient fan (01 no) and tub light (01)	<b>Rs.324</b>	<b>Rs.3300</b>	Cost of energy Rs.143.1 Saving=Rs.324 -Rs.143.1 = Rs.180.30	1.6 yrs..
<b>Room No-201</b> Replace 80W old fan and 40W tub light by energy efficient fan (01 no) and tub light (02)	<b>Rs.432</b>	<b>Rs.3600</b>	Cost of energy Rs.191.7 Saving=Rs.432 -Rs.191.7 = Rs.240.3	1.3 yrs..
<b>Reading Room</b> Replace 80W old fan and 40W tub light by energy efficient fan (3 no) and tub light (07)	<b>Rs.1404</b>	<b>Rs.11100</b>	Cost of energy Rs.623.7 Saving=Rs.1404 -Rs.623.7 = Rs.780.30	1.3 yrs..
<b>Room No-200</b> Replace 80W old fan and 40W tub light by energy efficient fan (3 no) and tub light (02)	<b>Rs.864</b>	<b>Rs.9600</b>	Cost of energy Rs.380.7 Saving=Rs.864 -Rs.380.7 = Rs.483.30	1.8 yrs..
<b>Room No-300</b> Replace 80W old fan and 40W tub light by energy efficient fan (3 no) and tub light (05)	<b>Rs.1188</b>	<b>Rs.10500</b>	Cost of energy Rs.526.5 Saving=Rs.1188 -Rs.526.5 = Rs.661.50	1.4 yrs..
<b>Room No-301/302</b> Replace 80W old fan and 40W tub light by energy efficient fan (01 no) and tub light (04)	<b>Rs.648</b>	<b>Rs.4200</b>	Cost of energy Rs.289 Saving=Rs.648 -Rs.289 = Rs.361.80	1 yrs..
<b>Room No-303</b> Replace 80W old fan and 40W tub light by energy efficient fan (2 no) and tub light (02)	<b>Rs.648</b>	<b>Rs.6600</b>	Cost of energy Rs.286.2 Saving=Rs.648 -Rs. 286.2 = Rs.361.80	1.6 yrs..





<b>Geography</b> Replace 80W old fan and 40W tub light by energy efficient fan (3 no) and tub light (3)	Rs.972	Rs.9900	Cost of energy Rs.429.3 Saving=Rs.972 -Rs.429.3 = Rs.497.70	1.7 yrs..
<b>Ladies Common Room</b> Replace 80W old fan and 40W tub light by energy efficient fan(02 no) and tub light (03)	Rs.756	Rs.6900	Cost of energy Rs 334.8. Saving=Rs.756 -Rs.334.8 = Rs.421.20	1.4 yrs..
<b>Swimming Tanks</b> Replace 80W old fan and 40W tub light by energy efficient fan (02 no) and tub light (26)	Rs.3240	Rs.13800	Cost of energy Rs.1452.6 Saving=Rs.3240 -Rs.1452.6 = Rs.1787.40	0.8 yrs..
<b>Ladies Hostel</b> Replace 80W old fan and 40W tub light by energy efficient fan (20 no) and tub light (21)	Rs.6588	Rs.13800	Cost of energy Rs.2910 Saving=Rs.6588 -Rs.2910 = Rs.3678	1.4 yrs..
<b>Conference hall</b> Replace 80W old fan and 40W tub light by energy efficient fan (08 no) and tub light (10)	Rs.2808	Rs.27000	Cost of energy Rs.1242 Saving=Rs.2808 -Rs.1242 = Rs.1566	1.5 yrs..
<b>Guest House</b> Replace 80W old fan and 40W tub light by energy efficient fan (4 no) and tub light (5)	Rs.1404	Rs.13500	Cost of energy Rs.621 Saving=Rs.1404 -Rs.621 = Rs.783	1.5 yrs..
<b>Canteen</b> Replace 40W old tub light by energy efficient tub light (04)	Rs.432	Rs.1200	Cost of energy Rs.194.4 Saving=Rs.432 -Rs.194.4 = Rs.237.60	0.5 yrs..
<b>Staff Quarters</b> Replace 80W old fan and 40W tub light by energy efficient fan (03 no) and tub light (04)	Rs.1080	Rs.10200	Cost of energy Rs.321 Saving=Rs.1080 -Rs. 321 = Rs.759	1.1 yrs..
<b>Principal Quarters</b> Replace 80W old fan and 40W tub light by energy efficient fan (4 no) and tub light (04)	Rs.1296	Rs.13200	Cost of energy Rs.478 Saving=Rs.1296 -Rs.478 = Rs.818	1.4 yrs..
<b>Boys Hostel</b> Replace 80W old fan and 40W tub light by energy efficient fan (14 no) and tub light (17)	Rs.4860	Rs.47100	Cost of energy Rs.2149 Saving=Rs.4860 -Rs.2149 = Rs.2711	1.5 yrs..
<b>Computer Science dept</b> Replace 80W old fan and 40W tub light by energy efficient fan (3no) and tub light (1)	Rs.756	Rs.9300	Cost of energy Rs.337.5 Saving=Rs.756 -Rs. 337.5 = Rs.418.5	1. yrs..
<b>Room No-300 to 302</b> Replace 80W old fan and 40W tub light by energy efficient fan (8 no) and tub light (10)	Rs.2808	Rs.27000	Cost of energy Rs.1242 Saving=Rs.2808 -Rs. 1242 = Rs.1566	1.10 yrs..
<b>Room No-100 to 103 (MCVC)</b> Replace 80W old fan and 40W tub light by energy efficient fan (5 no) and tub light (10)	Rs.2160	Rs.18000	Cost of energy Rs.959 Saving=Rs.2160 -Rs. 959 = Rs.1201	1.3 yrs..
<b>Wash Room-1</b> Replace 80W old fan and 40W tub light by energy efficient fan (1no) and tub light (1)	Rs.324	Rs.3300	Cost of energy Rs.143.1 Saving=Rs.324 -Rs. 143.1 = Rs.180.90	1.7 yrs..



<b>Wash Room-2</b> Replace 80W old fan and 40W tub light by energy efficient fan (1no) and tub light (1)	<b>Rs.324</b>	<b>Rs.3300</b>	Cost of energy Rs.143.1 Saving=Rs.324 -Rs.143.= = Rs.180.90	1.7 yrs..
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## 2. SUMMARY OF SAVINGS POTENTIAL OF CLASSROOM

### 1) Gymkhana

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	5	6	100	600	0.6	Replace 80W old fan and 40W tub light by energy efficient fan(09no) and tub light (05)
2	Fan	80	9	6	720	4320	4.32	
3	Tub light	40	5	6	200	1200	1.2	
				<b>Total</b>	<b>1020</b>	<b>6120</b>	<b>6.12</b>	

### 2) Mathematics Department

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	3	6	240	1440	1.44	Replace 80W old fan and 40W tub light by energy efficient fan (3 no) and tub light (04)
2	Tub light	40	4	6	160	960	0.96	
				<b>Total</b>	<b>400</b>	<b>2400</b>	<b>2.4</b>	

### 3) Zoology Department

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	3	6	240	1440	1.44	Replace 80W old fan and 40W tub light by energy efficient fan (3 no) and tub light (05)
2	Tub light	40	5	6	200	1200	1.2	
				<b>Total</b>	<b>440</b>	<b>2640</b>	<b>2.64</b>	

### 4) Botany Department

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	2	6	160	960	0.96	Replace 80W old fan and 40W tub light by energy efficient fan (2 no) and tub light (05)
2	Tub light	40	5	6	200	1200	1.2	
				<b>Total</b>	<b>360</b>	<b>2160</b>	<b>2.16</b>	



### 5) Statistics Department

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	5	6	400	2400	2.4	Replace 80W old fan and 40W tub light by energy efficient fan (5 no) and tub light (08)
2	Tub light	40	8	6	320	1920	1.92	
Total					720	4320	4.32	

### 6) Microbiology Department

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	2	6	160	960	0.96	Replace 80W old fan and 40W tub light by energy efficient fan (2 no) and tub light (04)
2	Tub light	40	4	6	160	960	0.96	
Total					320	1920	1.92	

### 7) Physics Lab-1

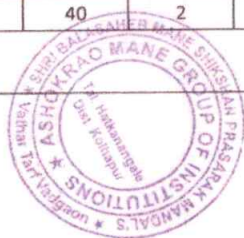
Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	4	6	80	480	0.48	Replace 80W old fan and 40W tub light by energy efficient fan(01no) and tub light (04)
2	Fan	80	1	6	80	480	0.48	
3	Tub light	40	4	6	160	960	0.96	
Total					320	1920	1.92	

### 8) Physics Lab-2

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	4	6	80	480	0.48	Replace 80W old fan and 40W tub light by energy efficient fan(01no) and tub light (04)
2	Fan	80	1	6	80	480	0.48	
3	Tub light	40	4	6	160	960	0.96	
Total					320	1920	1.92	

### 9) Record room

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Tub light	40	2	6	80	480	0.48	Replace 40W old tub light by energy efficient tub light (02)
Total					80	480	0.48	





### 10) Wash room (Ladies)

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Tub light	40	2	6	80	480	0.48	Replace 40W old tub light by energy efficient tub light (02)
Total					80	480	0.48	

### 11) Wash room (Gents)

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Tub light	40	2	6	80	480	0.48	Replace 40W old tub light by energy efficient tub light (02)
Total					80	480	0.48	

### 12) Lab Porch (2<sup>nd</sup> Floor)

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Tub light	40	2	6	80	480	0.48	Replace 40W old tub light by energy efficient tub light (02)
Total					80	480	0.48	

### 13) Room No-01 (Sociology Department)

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	1	6	20	120	0.12	Replace 80W old fan and 40W tub light by energy efficient fan(01no) and tub light (01 no)
2	Fan	80	1	6	80	480	0.48	
3	Tub light	40	1	6	40	240	0.24	
Total					140	840	0.84	

### 14) Room no 200 to 215

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	3	6	60	360	0.36	Replace 80W old fan and 40W tub light by energy efficient fan (32 no) and tub light (33)
2	Fan	80	32	6	2560	15360	15.36	
3	Tub light	40	33	6	1320	7920	7.92	
Total					3940	23640	23.64	



### 15) Porch (1<sup>st</sup> Floor)

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Tub light	40	2	6	80	480	0.48	Replace 40W old tub light by energy efficient tub light (02)
Total					80	480	0.48	

### 16) Room no 105 to 111

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	16	6	1280	7680	7.68	Replace 80W old fan by energy efficient fan (16no)
2	LED Bulb	20	18	6	360	2160	2.16	
Total					1640	9840	9.84	

### 17) Office

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	5	6	100	600	0.6	Replace 80W old fan and 40W tub light by energy efficient fan (06 no) and tub light (01 no)
2	Fan	80	6	6	480	2880	2.88	
3	Tub light	40	1	6	40	240	0.24	
Total					620	3720	3.72	

### 18) Principal cabin

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	2	6	40	240	0.24	Replace 80W old fan and 40W tub light by energy efficient fan (02 no) and tub light (02)
2	Fan	80	4	6	320	1920	1.92	
3	Tub light	40	2	6	80	480	0.48	
Total					440	2640	2.64	

### 19) IQAC Room

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	2	6	160	960	0.96	Replace 80W old fan and 40W tub light by energy efficient fan (2 no) and tub light (02)
2	Tub light	40	2	6	80	480	0.48	
Total					240	1440	1.44	





## 20) Ground Floor

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	5	6	100	600	0.6	Replace 40W old tub light by energy efficient tub light (05 no)
2	Tub light	40	1	6	40	240	0.24	
				<b>Total</b>	<b>140</b>	<b>840</b>	<b>0.84</b>	

## 21) Room no 100 to 101

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	7	6	140	840	0.84	Replace 80W old fan and 40W tub light by energy efficient fan (08 no) and tub light (01 no)
2	Fan	80	8	6	640	3840	3.84	
3	Tub light	40	1	6	40	240	0.24	
				<b>Total</b>	<b>820</b>	<b>4920</b>	<b>4.92</b>	

## 22) Marathi Department

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	1	6	20	120	0.12	Replace 80W old fan and 40W tub light by energy efficient fan (02 no) and tub light (01 no)
2	Fan	80	2	6	160	960	0.96	
3	Tub light	40	1	6	40	240	0.24	
				<b>Total</b>	<b>220</b>	<b>1320</b>	<b>1.32</b>	

## 23) History Department

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	1	6	80	480	0.48	Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (03)
2	Tub light	40	3	6	120	720	0.72	
				<b>Total</b>	<b>200</b>	<b>1200</b>	<b>1.2</b>	

## 24) Economic Department

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	1	6	80	480	0.48	Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (02)
2	Tub light	40	2	6	80	480	0.48	
				<b>Total</b>	<b>160</b>	<b>960</b>	<b>0.96</b>	



### 25) Hindi Department

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	1	6	80	480	0.48	Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (02)
2	Tub light	40	2	6	80	480	0.48	
Total					160	960	0.96	

### 26) NCC Department

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	1	6	20	120	0.12	Replace 80W old fan and 40W tub light by energy efficient fan (01 no) and tub light (02)
2	Fan	80	1	6	80	480	0.48	
3	Tub light	40	2	6	80	480	0.48	
Total					180	1080	1.08	

### 27) Physical Education Department

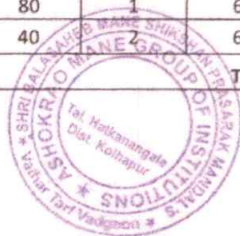
Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	1	6	80	480	0.48	Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (02)
2	Tub light	40	2	6	80	480	0.48	
Total					160	960	0.96	

### 28) Library

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	5	6	400	2400	2.4	Replace 80W old fan by energy efficient fan (12no)
2	LED Bulb	20	12	6	240	1440	1.44	
Total					640	3840	3.84	

### 29) Room No-102

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	1	6	80	480	0.48	Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (02)
2	Tub light	40	2	6	80	480	0.48	
Total					160	960	0.96	





### 30) NSS Department

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	1	6	80	480	0.48	Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (02)
2	Tub light	40	2	6	80	480	0.48	
<b>Total</b>					<b>160</b>	<b>960</b>	<b>0.96</b>	

### 31) Room No-104

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	1	6	20	120	0.12	Replace 80W old fan and 40W tub light by energy efficient fan (03 no) and tub light (02)
2	Fan	80	3	6	240	1440	1.44	
3	Tub light	40	2	6	80	480	0.48	
<b>Total</b>					<b>340</b>	<b>2040</b>	<b>2.04</b>	

### 32) Commerce Department

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	1	6	80	480	0.48	Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (01)
2	Tub light	40	1	6	40	240	0.24	
<b>Total</b>					<b>120</b>	<b>720</b>	<b>0.72</b>	

### 33) Room No-106

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	1	6	80	480	0.48	Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (02)
2	Tub light	40	2	6	80	480	0.48	
<b>Total</b>					<b>160</b>	<b>960</b>	<b>0.96</b>	

### 34) Room No-105

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	1	6	20	120	0.12	Replace 80W old fan and 40W tub light by energy efficient fan (01 no) and tub light (01)
2	Fan	80	1	6	80	480	0.48	
3	Tub light	40	1	6	40	240	0.24	
<b>Total</b>					<b>140</b>	<b>840</b>	<b>0.84</b>	



### 35) Room No-201

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	1	6	20	120	0.12	Replace 80W old fan and 40W tub light by energy efficient fan (01 no) and tub light (02)
2	Fan	80	1	6	80	480	0.48	
3	Tub light	40	2	6	80	480	0.48	
Total					180	1080	1.08	

### 36) Reading Room

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	3	6	240	1440	1.44	Replace 80W old fan and 40W tub light by energy efficient fan (3 no) and tub light (07)
2	Tub light	40	7	6	280	1680	1.68	
Total					520	3120	3.12	

### 37) Room No-200

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	3	6	240	1440	1.44	Replace 80W old fan and 40W tub light by energy efficient fan (3 no) and tub light (02)
2	Tub light	40	2	6	80	480	0.48	
Total					320	1920	1.92	

### 38) Room No-300

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	3	6	240	1440	1.44	Replace 80W old fan and 40W tub light by energy efficient fan (3 no) and tub light (05)
2	Tub light	40	5	6	200	1200	1.2	
Total					440	2640	2.64	

### 39) Room No-301/302

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	1	6	80	480	0.48	Replace 80W old fan and 40W tub light by energy efficient fan (1 no) and tub light (04)
2	Tub light	40	4	6	160	960	0.96	
Total					240	1440	1.44	





#### 40) Room No-303

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	2	6	160	960	0.96	Replace 80W old fan and 40W tub light by energy efficient fan (2 no) and tub light (02)
2	Tub light	40	2	6	80	480	0.48	
Total					240	1440	1.44	

#### 41) Geography

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	3	6	240	1440	1.44	Replace 80W old fan and 40W tub light by energy efficient fan (3 no) and tub light (3)
2	Tub light	40	3	6	120	720	0.72	
Total					360	2160	2.16	

#### 42) Ladies Common Room

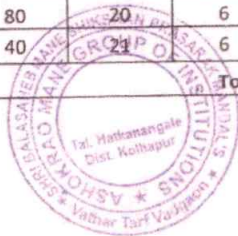
Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	2	6	40	240	0.24	Replace 80W old fan and 40W tub light by energy efficient fan(02 no) and tub light (03)
2	Fan	80	2	6	160	960	0.96	
3	Tub light	40	3	6	120	720	0.72	
Total					320	1920	1.92	

#### 43) Swimming Tanks

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	64	6	1280	7680	7.68	Replace 80W old fan and 40W tub light by energy efficient fan (02 no) and tub light (26)
2	Fan	80	20	6	160	960	0.96	
3	Tub light	40	21	6	1040	6240	6.24	
Total					2480	14880	14.88	

#### 44) Ladies Hostel

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	27	6	540	3240	3.24	Replace 80W old fan and 40W tub light by energy efficient fan (20 no) and tub light (21)
2	Fan	80	20	6	1600	9600	9.6	
3	Tub light	40	21	6	840	5040	5.04	
Total					2980	17880	17.88	



#### 45) Conference hall

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	2	6	40	240	0.24	Replace 80W old fan and 40W tub light by energy efficient fan (08 no) and tub light (10)
2	Fan	80	8	6	640	3840	3.84	
3	Tub light	40	10	6	400	2400	2.4	
Total					1080	6480	6.48	

#### 46) Guest House

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	4	6	320	1920	1.92	Replace 80W old fan and 40W tub light by energy efficient fan (4 no) and tub light (5)
2	Tub light	40	5	6	200	1200	1.2	
Total					520	3120	3.12	

#### 47) Canteen

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	1	6	20	120	0.12	Replace 40W old tub light by energy efficient tub light (04)
2	Tub light	40	4	6	160	960	0.96	
Total					180	1080	1.08	

#### 48) Staff Quarters

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	1	6	20	120	0.12	Replace 80W old fan and 40W tub light by energy efficient fan (03 no) and tub light (04)
2	Fan	80	3	6	240	1440	1.44	
3	Tub light	40	4	6	160	960	0.96	
Total					420	2520	2.52	

#### 49) Principal Quarters

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	2	6	40	240	0.24	Replace 80W old fan and 40W tub light by energy efficient fan (4 no) and tub light (4)
2	Fan	80	4	6	320	1920	1.92	
3	Tub light	40	4	6	160	960	0.96	
Total					520	3120	3.12	





### 50) Boys Hostel

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	1	6	20	120	0.12	Replace 80W old fan and 40W tub light by energy efficient fan(14 no) and tub light (17)
2	Fan	80	14	6	1120	6720	6.72	
3	Tub light	40	17	6	680	4080	4.08	
Total					1820	10920	10.92	

### 51) Computer Science dept

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	3	6	240	1440	1.44	Replace 80W old fan and 40W tub light by energy efficient fan (83no) and tub light (1)
2	Tub light	40	1	6	40	240	0.24	
Total					280	1680	1.68	

### 52) Room No-300 to 302

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	8	6	640	3840	3.84	Replace 80W old fan and 40W tub light by energy efficient fan (8 no) and tub light (10)
2	Tub light	40	10	6	400	2400	2.4	
Total					1040	6240	6.24	

### 53) Room No-100 to 103 (MCVC)

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	5	6	400	2400	2.4	Replace 80W old fan and 40W tub light by energy efficient fan (5 no) and tub light (10)
2	Tub light	40	10	6	400	2400	2.4	
Total					800	4800	4.8	

### 54) Wash Room-1

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	1	6	80	480	0.48	Replace 80W old fan and 40W tub light by energy efficient fan (1no) and tub light (1)
2	Tub light	40	1	6	40	240	0.24	
Total					120	720	0.72	



55) Wash Room-2

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	Fan	80	1	6	80	480	0.48	Replace 80W old fan and 40W tub light by energy efficient fan (1no) and tub light (1)
2	Tub light	40	1	6	40	240	0.24	
<b>Total</b>					<b>120</b>	<b>720</b>	<b>0.72</b>	





### 3. SUMMARY ANALYSIS OF CURRENT SCENARIO:

#### 3.1 ANALYSIS ENERGY METER.

As per MSEDCL tariff LT-I Residential Tariff

Consumption Slab (kWh)	Fixed/ Demand Charge	Wheeling Charge (Rs/kWh)	Energy Charge (Rs. /kWh)
0-100 units	Three Phase - Rs. 373 per month	1.38	4.68
101 -300 units		1.38	6.73
301 -500 units		1.38	9.75

Consumption Slab (kWh)	Fixed/ Demand Charge	Wheeling Charge (Rs/kWh)	Energy Charge (Rs. /kWh)
0-100 units	Single Phase - Rs. 102 per month	1.38	3.44
101 -300 units		1.38	7.34
301 -500 units		1.38	10.36

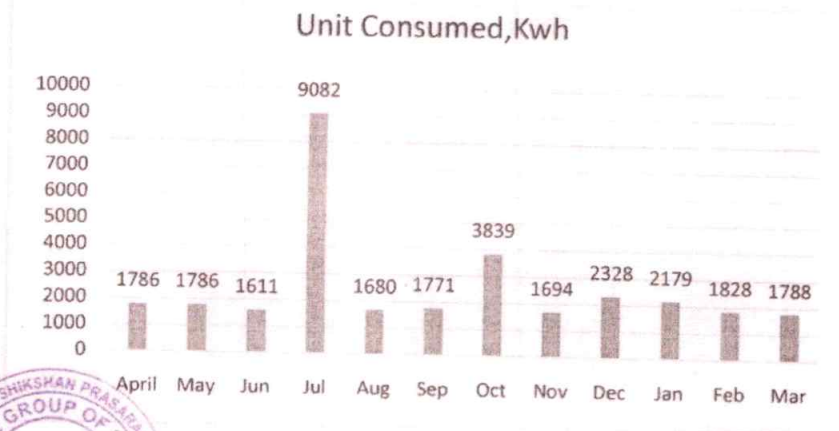
Approx. Unit charges including taxes: - Rs.-20.32/- Unit

Back up for computer systems: - Online UPS system installed for all computer systems and Lab.



Maximum Consumption in year 2021/22 = Jul 2021 (2179 units)

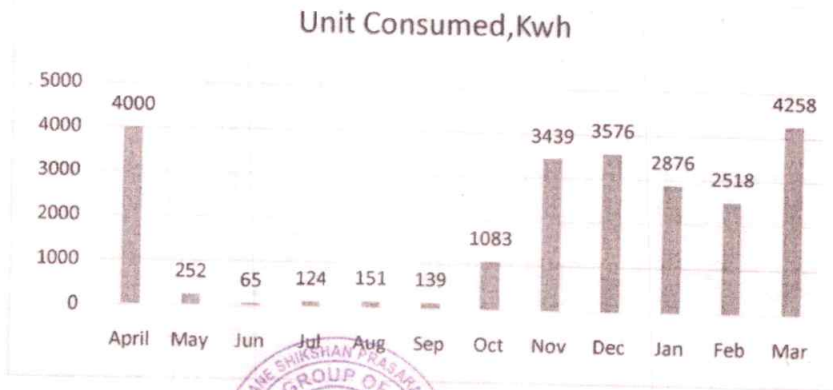
266511290864			
Sr.No	Month	Unit Consumed in KWh	Bill Amount, Rs.
1	21-Apr	1786	13890
2	21-May	1786	13890
3	21-Jun	1611	12570
4	21-Jul	9082	17710
5	21-Aug	1680	13090
6	21-Sep	1771	13660
7	21-Oct	3839	16010
8	21-Nov	1694	13090
9	21-Dec	2328	17970
10	22-Jan	2179	16840
11	22-Feb	1828	14200
12	22-Mar	1788	13910
	Total	31372	176830
	Maximum	9082	17710
	Minimum	1611	12570
	Average	2614.333333	14735.83333





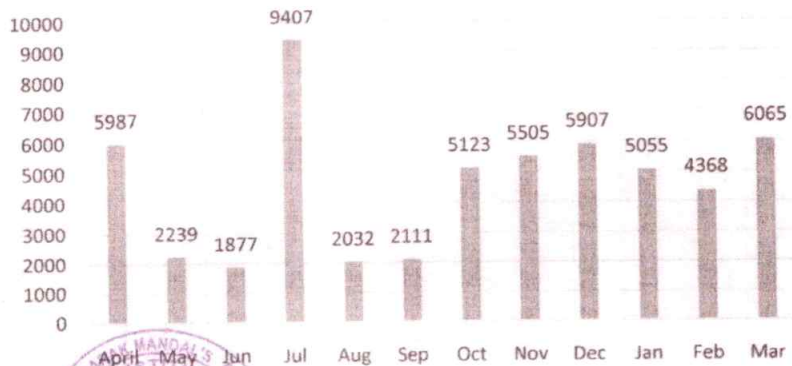
Maximum Consumption in year 2021/22 = Apr 2021 (4000 units )

266511290899				
Sr.No	Month	Unit Consumed in KWh	Bill Dimand (KVA)	Bill Amount, Rs.
1	21-Apr	4000	27	52887.19
2	21-May	252	27	19595.59
3	21-Jun	65	27	17622.76
4	21-Jul	124	27	15419.16
5	21-Aug	151	27	18904.43
6	21-Sep	139	27	18710.66
7	21-Oct	1083	27	27658.84
8	21-Nov	3439	27	50856.11
9	21-Dec	3576	27	52633.62
10	22-Jan	2876	27	45016.86
11	22-Feb	2518	27	86570
12	22-Mar	4258	27	58460
	Total	22481	27	464335.22
	Maximum	4000		86570
	Minimum	124		15419.16
	Average	1873.416667	2.25	38694.60167



266511290856			
Sr.No	Month	Unit Consumed in KWh	Bill Amount, Rs.
1	21-Apr	5987	68737.19
2	21-May	2239	35445.59
3	21-Jun	1877	32152.76
4	21-Jul	9407	37079.16
5	21-Aug	2032	37934.43
6	21-Sep	2111	34340.66
7	21-Oct	5123	45628.84
8	21-Nov	5505	33136.11
9	21-Dec	5907	40273.62
10	22-Jan	5055	31896.86
11	22-Feb	4368	71420
12	22-Mar	6065	43610
	Total	55676	511655.22
	Maximum	9407	68737.19
	Minimum	1877	31896.86
	Average	4639.666667	42637.935

Unit Consumed, Kwh





### 3.3 INSTITUTE IN PROCESS TOWARDS ENERGY CONSERVATION:

- Step by step replacing the 40 Watt i.e. T12 Fluorescent Tube Lights in the class rooms and Laboratory rooms and using 18 W LED Tube light which gives almost same luminous flux.
- Replacing the 80W ceiling fan in class rooms and laboratories by energy efficient fans of 35 W is much help to save the energy.



#### 4.0 SCOPE OF WORK:

1. Detailed examination of the existing energy uses of the facility.
2. Measurement and analysis of demand and power factor, energy meter to reduce the energy bill.
3. Detailed examination of lighting system and other electrical equipment in laboratory and class rooms.
4. Survey report of lighting system in overall institute.



## 5 METHODOLOGY:

### 5.1 SAVING POTENTIAL CALCULATION IN EACH CLASS ROOM AND LABORATORY:

Assumptions: - Working hours of class room, laboratory and office = Approx.6hrs  
Unit for institute energy bill = Approx. Rs.15 / kwh

Specimen calculation for Physics lab:

#### 1) Physics Lab-1

Sr.no	Particulars	Wattage	Quantity	Run Time (Hr/Day)	Total wattage	Watt Hours/Day	Energy consumed per day kWh/day	Recommendation
1	LED Bulb	20	4	6	80	480	0.48	Replace 80W old fan and 40W tub light by energy efficient fan(01no) and tub light (04no)
2	Fan	80	1	6	80	480	0.48	
3	Tub light	40	4	6	160	960	0.96	
Total					320	1920	1.92	

**Specimen calculation for tube set :-** Energy consumption of conventional tube light set :- 40Watt capacity tube set used for 6hrs per day so unit consumed by tube is  $\frac{40\text{Watt} \times 6\text{hr}}{1000} = 0.24\text{kwh}$  per day and monthly unit consumed by tube set =  $0.24 \times 30$  days = 7.2kwh / month. Energy consumption of one tube in terms of rupees = 7.2kwh x Rs.15 = Rs.108

**Specimen calculation for Fan :-** A old fan capacity is 80W and used for 6 hrs. day so unit consumed by fan is  $\frac{80\text{Watt} \times 6\text{hr}}{1000} = 0.48\text{kwh}$  per day and monthly unit consumed by fan =  $0.48 \times 30$  days = 14.4 kwh / month. Energy consumption of fan in terms of Rs. = 14.4 kwh x Rs.15 = Rs.216.

Computer Lab has one old ceiling fan. So monthly expenditure due to fan is Rs.216

If old fan will have replaced by new energy efficient (BEE star rating) it will consume energy Rs. 83.16 for one month.

Computer lab :- Replace 80W old fan by energy efficient fan(1no)	Cost of energy Rs.110.88.	Investment for BEE star rated Fan - Rs.1700	Cost of energy Rs.83.16 Saving=Rs.110.88 -Rs. 83.16 = Rs.27.72	Payback period 5.1 yrs.
------------------------------------------------------------------	---------------------------	---------------------------------------------	-------------------------------------------------------------------------	-------------------------

Tube set type	Cost Rs.	Payback	Life	Efficacy
T-8 LED tube light 1.00 inch	1600-2000	3-4 Yrs	10-15 Yrs.	@100-120 Lumens / watt
T-5 LED tube light 0.625 inch	500	6 month-1yr.	3-4 yrs.	110 lumens /watt

#### Evolution of BEE 5 star rated Fan

Speed	1	2	3	4	5
Wattage	13 W	24 W	30 W	40W	55W





Cost: - Rs. 1700 -2000 and Life: - 10-15 yrs.

### Evolution of regular rated Fan

Speed	1	2	3	4	5
Wattage	14 W	26 W	39 W	48 W	76 W

Cost: - Rs. 1000 -1500 and Life: - 5-10 yrs.

A typical desktop computer uses about up to 250 watts and 20-40 watts for an LCD monitor and don't forget related devices like cable modem uses 7 watts, D-Link DI-604 router uses 4.5 watts,

To calculate your costs, use this formula:

$$\frac{\text{Watts} \times \text{Hours Used}}{1000} \times \text{Cost per kilowatt-hour} = \text{Total Cost}$$

One LCD computer consumes 1.5Kwh (Unit) per day i.e. 9Rs. Per day (300 W x 5 hrs.)

Old version computer consumes 2.5kwh(unit) per day i.e.15Rs. per day (500 W x5hrs)

**Institute has 87 numbers of computer sets.**



## 6.0 CONCLUSIONS AND GENERAL RECOMMENDATION OF THE AUDIT

- a) Replace conventional tube light fittings of 40W with T-5 LED Tube light for 400 – 500 lumens light efficacy. Replace 80 W old fan by energy efficient fans.
- b) Replace old version computer system with energy efficient LCD monitor and new generation energy efficient computer systems.
- c) Ensure maximum natural daylight and natural ventilation in class rooms, Labs and staff rooms i.e. when it's bright outside in the daytime, turn off the light and open blinds of windows.
- d) In fact, try to turn on lights in our cabin, labs only after the sun sets. Do your reading and writing near a window or natural illumination.
- e) Installing occupancy sensors to turn ON-OFF lighting and fan can save considerable energy.
- f) Overhead projectors, computers and UPS all use electricity for power. Be sure to unplug these types of items when they're not in use can achieve energy saving considerably.
- g) Use power "saving option" (hibernate mode) for computer and possibly switched off when not in use.
- h) Consider planting trees and shrubs in strategic locations to help to reduce the temperature and airflow in Laboratory, classroom etc. Trees planted on the west and south sides of buildings help to keep the buildings shaded during hotter weather.
- i) to promote Green Energy and Energy Conservation a roof-top Solar PV plant can be useful.
- j) Suggested to protect all Transformer, Generators and UPS with fencing and keep the awareness boards and safety signs on 'Dangers' and 'Warnings, etc.
- k) Advised to cover Electrical wires, switch boxes, inverters, and stabilizers not to cause any problem to the staff and student members.
- l) Advised to replace old generation computers and TVs with LED monitors and old incandescent (tungsten) bulbs with LED lights and install automatic street solar lights.
- m) Suggested to install Roof top solar power plants and Solar water heaters.



- n) At hostel replace the old type of electric wiring and fitting by new proper ratings Heat Resistant and Fire Retardant (HRFR) cables and wire with energy efficient luminaries.



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