

# EESA



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## EESA COUNCIL : 2014-15



### **EESA CONVENER -**

Mrs. Sreedevi Nair

Assistant Professor

Electrical Engineering Department



## **FROM THE H.O.D'S DESK**

### **Q. What is your view about the growth of electrical engineering department in our college?**

The department has seen tremendous growth over the years and this is reflected in the university results, placement records as well as numerous co-curricular achievements of the students and teachers alike. We are currently trying to focus on the research aspect of our department. Research and development adds a lot of value to the college as a whole. Hence we are trying to implement more research related activities.



### **Q. Where do you think electrical engineering department stands in today's market of software and Information Technology?**

In today's economy, the market of IT appears to be so lucrative that even electrical engineers are opting for such jobs. Unfortunately, the growth for core branch engineers in such field is very limited. I personally would like to suggest electrical engineering graduates to remain in their own field itself since by doing so there is much higher scope for technical enrichment and greater access to climb the corporate ladder.

### **Q. Why do you think it is necessary to encourage student councils like EESA in colleges?**

Apart from academics, qualities like leadership, time management, team work etc. are of equal importance. These councils help to inculcate these traits among the students which will help them to excel in the corporate world.

## **EDITORIAL COLUMN**

Like the rays of sunlight dazzle the morning dew drops, our magazine is a sincere effort to glorify the aspects of electrical engineering department of FR. C. Rodrigues Institute of Technology, Vashi. This magazine is an attempt to enlighten the young minds about the various achievements in one of the oldest and most diverse branch of engineering. The successful completion of this magazine required a great deal of effort and coordination. Since obstacles are inevitable in the journey to achieve success, we too had to tackle our share of ups and downs during this journey. However we faced these challenges with sheer determination, innovative ideas and a strong vision. Finally the patience and hard work has gained its coveted reward. This magazine will let our readers to embark on an amusing ride across the field of electrical engineering and hence we have chosen the title of this issue as 'ODYSSEY'. By means of this magazine, the entire team of EESA welcomes you to explore the fascinating world of electrical engineering.

### **EDITORIAL TEAM – NILANJANA NAG**

**ZULFIKAR KHAN**

**SHUBHAM KAMBLE**

## **ACKNOWLEDGEMENT**

We would like to take this opportunity to thank our Head of Department, Dr.Sincy George for sharing with us her valuable words. We are extremely grateful to Prof. Sreedevi Nair for her endless support. Finally we thank all the fellow team members for their constant encouragement and whole hearted cooperation during the preparation of this magazine.

## **DEPARTMENT OF ELECTRICAL ENGINEERING**

Electrical engineering is considered to be an evergreen branch of engineering. Despite being one of the oldest engineering disciplines, it continues to remain in high demand, even in today's world of software and information technology. In FCRIIT, VASHI the department of electrical engineering was formed in 1994 with a modest number of forty students. Over the years, the department has seen tremendous growth and has a reputation of delivering university toppers for consecutive several years. The department is well equipped with laboratories like Electrical machines Lab, Power System Protection Lab, Basic Electrical and Electronics Lab, Controls Lab and MATLAB. These laboratories have advanced software like SCADA and ETAP. The departmental library comprises of a diverse collection of reference books which can be easily accessed by students and professors as per their convenience.

### **FACULTY TEAM**

<b>PROFESSOR</b>	2
<b>ASSOCIATE PROFESSOR</b>	4
<b>ASSISTANT PROFESSOR</b>	13
<b>LAB ASSISTANT</b>	5

### **FINAL YEAR RESULT (2014-15)**

<b>University Rank</b>	<b>Name of Student</b>	<b>Percentage</b>
1 <sup>st</sup>	<u>AmitkumarYadav</u>	<u>86.20%</u>
2 <sup>nd</sup>	<u>DhanashreeSadaye</u>	<u>83.33%</u>
5 <sup>th</sup>	<u>RavindraKachare</u>	<u>81.07%</u>
8 <sup>th</sup>	<u>PrajaktaPatil</u>	<u>79.50%</u>
11 <sup>th</sup>	<u>Rahul Tayade</u>	<u>79.20%</u>
12 <sup>th</sup>	<u>OnkarMayekar</u>	<u>79.00%</u>
15 <sup>th</sup>	<u>ShreyaChandrani</u>	<u>78.67%</u>

## **PLACEMENT RECORDS (2014-15)**

<b>COMPANY NAME</b>	<b>NO. OF STUDENTS</b>	<b>PACKAGE(IN LAKHS)</b>
PETROFAC	1	5.5
L&T Ltd.	5	4.88
UHDE	5	4.1
TCS	12	3.18
JACOBS	4	3.5
iGATE	1	3.15
SIEMENS	3	5.2
PENTAIR	1	3.5
TECHNIP	1	3
JSW	5	4.58
MU-SIGMA	1	
TECHNIMONT	1	
ETAP	4	3
<b>TOTAL NO. OF STUDENTS PLACED = 44</b>		

## FACULTY PUBLICATIONS (2014-15)

### International Journals

Sr. No.	Title of paper	Details	Name of Staff
1	Optimized Reactive Power Compensation Using Fuzzy Logic Controller	Journal of The Institution of Engineers (India) Series B. Electrical, Electronics and Computer Engineering ISSN 2250-2106	Dr. Sincy George Mini N
2	A novel Reconfigurable Microgrid Architecture with Renewable sources and storage	IEEE transactions on Industry Applications	Prof. SushilThale
3	Analysis of HTEM Horn type Antenna for High power Impulse Radiation Applications	IEEE Transactions on Plasma Science Vol-42, no-10 , Oct 2014	Dr. Bindu S
4	Intelligent Lighting-Fan Control in Multi Task Area (A case Study)	International Journal on Recent Technologies in Mechanical and Electrical Engineering, ISSN:2349-7947,Vol1, Issue 1	MrsPoornimaRao
5	Grid Interfacing Technologies for Distributed Generation and Power Quality issues-A review	International Journal of Innovative and Emerging Research in Engineering, ISSN:2394-3343,Vol 2, Issue 3	SeemaJadhav RuchiHarchandani
6	Selection of power converter for standalone Photovoltaic system	IJETSR ISSN 2394-3386, Vol 2, Issue 4	MohiniKher Rashmi Kale
7	Energy conservation in a small scale industry ( a case study)	International Journal on Recent Technologies in mechanical and electrical engineering, ISSN:2349-7947,Vol 2, Issue 4	MrsPoornimaRao

## National and International Conferences

Sr. No.	Title of paper	Details	Name of Staff
1	Control of DG in Grid-connected and Intentional Islanded mode of Operation	International conference Interface-2014, VJTI Mumbai	SeemaJadhav Dr. Sincy George MahendraRane
2	Power Factor Improvement in Rectifier circuit-A Simulation Study	International Conference on Magnetics, Machines and Drives (AICERA-2014), Kerala.	Divya S Dr. Sincy George
3	Design and Simulation of 50 kV, 50 A solid state Marx Generator	International Conference on Magnetics, Machines and Drives (AICERA-2014), Kerala.	Harshada B Dr. Bindu S Dr. Sincy George
4	Magnetostatic Analysis and Power Optimisation of Electric Release Brake	International Conference on Magnetics, Machines and Drives (AICERA-2014), Kerala.	Bindu R
5	Design and Simulation of 30 kV, solid state DC source	International Conference on Magnetics, Machines and Drives (AICERA-2014), Kerala.	Dr. Bindu S Dr. Sincy George
6	Sliding mode controller with Adaptive sliding coefficient for Buck converter	6 <sup>th</sup> IEEE Power India International conference 2014	Mini N
7	A High Voltage Zero Current Switching- Series Resonant Converter Using DSP	International Journal Of Engineering Research and Technology (IJERT) ICNTE-2015 Conference Proceedings	Dr. Bindu S Dr. Sincy George
8	Thermoelectric Effect – An Alternative Energy Source	International Journal Of Engineering Research and Technology (IJERT) ICNTE-2015 Conference Proceedings	MohiniKher
9	A Comparison of Ant Colony Optimization Algorithms Applied to Distribution Network Reconfiguration	International Journal Of Engineering Research and Technology (IJERT) ICNTE-2015 Conference Proceedings	Divya M
10	Solar Coupled Switched Mode Power Supply	International Journal Of Engineering Research and Technology (IJERT) ICNTE-2015 Conference Proceedings	Rashmi Kale
11	Solid state Bipolar Marx Generator Topologies: A Comparative study	International Journal Of Engineering Research and Technology (IJERT) ICNTE-2015 Conference Proceedings	RuchiHarchandan i , Dr.Bindu S.
12	Comparison of Three Different Topologies of a Five Level Multilevel inverter	International Journal Of Engineering Research and Technology (IJERT) ICNTE-2015 Conference Proceedings	Mini Rajeev
13	Design of PI Controller for	International Journal Of	SeemaJadhav



	Grid-connected DG unit using Root Locus Technique	Engineering Research and Technology (IJERT) ICNTE-2015 Conference Proceedings	Dr.Sincy George,
14	Design and Development of a Solar PV Inverter for Water Pumping Applications	International Journal Of Engineering Research and Technology (IJERT) ICNTE-2015 Conference Proceedings	Sushil S Thale
15	Design and Development of Solar PV Based Grid Interactive Inverter	International Journal Of Engineering Research and Technology (IJERT) ICNTE-2015 Conference Proceedings	Sushil S Thale
16	Harmonic Analysis and Selective Elimination in PWM Technique Controlled Three Phase Inverter	International Journal Of Engineering Research and Technology (IJERT) ICNTE-2015 Conference Proceedings	Sushil S Thale
17	Electrogastrography: a non-invasive technique to evaluate gastric electrical activity for early detection of stomach cancer	Health Tech Innovations (HTI) 2015 – SAMEER, IIT Bombay, Powai, Mumbai, 2015	Sushil S Thale
18	Performance analysis of fractional frequency transmission system using hardware setup	International conference on Electrical, Electronics, Signals and communication and operation(EESCO-2015)	MahendraRane
19	An investigation of standby power losses	International conference march 2015	Divya M
20	Modelling and simulation of Fuel cell based system for Residential Applications	International conference on Advances in Science and Technology ICAST-2014	Sreedevi Nair
21	Design and simulation of a Fuel cell based system for Residential Applications	24 <sup>th</sup> IRF International conference Pune.	Sreedevi Nair

## **LECTURE SERIES**

<b>TOPIC</b>	<b>FACULTY</b>	
Effect of diode rectifiers on power quality	Dr. Sincy George	SH 2014
Design and simulation of 50KV, 50A, solid state Marx Generator	Harshada B	
Hardware implementation of PWM rectifier using DSP	Divya S	
Futuristic Electricity Grid-Smart Grids and Microgrids	Mr. SushilThale	FH 2015
How to write literature survey	Dr. Bindu S	

## **INDUSTRIAL VISITS**

### **SH 2014**

- SEM 3 -Bhira Tal Race Power Plant, Mahagenco
- SEM 5 – Telawne Power Equipment, Rabale
- SEM 7 – Goa Visit

### **FH 2015**

- SEM 4 – Telawne Power Equipments Ltd., Rabale
- SEM 6 – Sanpada Car shed, Central Railways
- SEM 8 – Larsen & Toubro Limited, Pune

## ELECTRICAL ENGINEERING STUDENTS ASSOCIATION

EESA, a student council of electrical engineering department comprises of twenty members where each one of them is allotted a specific designation. The council is responsible for organizing the departmental techno cultural festival apart from various sports events, seminars and workshops.

### TRANSIENT

The annual festival of Electrical Engineering Department was first conducted by EESA in 2013. Considering the success of the technical fest which was initiated by our seniors, we took immense pleasure to continue the legacy of TRANSIENT and presenting it to another level as a techno cultural festival. 'TRANSIENT 2K14' was organized from 29<sup>th</sup> September, 2014 to 1<sup>st</sup> October, 2014 with the basic aim to provide a platform for the students to showcase their technical and cultural skills as well as develop a competitive spirit among the participants. The festival received an overwhelming response as students actively participated in the events to test their technical abilities and cultural skills.



## Itinerary of Transient 2K14-

RESIST THE FAULTS	29 <sup>TH</sup> September, 2014
MELT THE METAL	30 <sup>TH</sup> September, 2014
LEVEL UP	30 <sup>TH</sup> September, 2014
TALENT MANIA	1 <sup>st</sup> October, 2014

### 1. RESIST THE FAULTS



It was a technical event comprising of two levels wherein the participants had to detect faults from the given circuit in the first round. In the next round, the qualified candidates were given the task to determine the equivalent resistance of the circuit.

Winners: 1<sup>st</sup>- Michael Saldanha and Akshay Mahajan (Elect-7)  
2<sup>nd</sup>- Akshat Shenoy and Denise Athaide (Elect-7)

## 2. MELT THE METAL



This completion was aimed to test the soldering skills of the participants. Candidates were given with a circuit diagram which had to be soldered on a PCB.

Winners: 1<sup>st</sup> – TanmayBhopi and AmeyaWagh (Extc-7)

2<sup>nd</sup> – HarshaliBhonsale and SayaliHarer (Elect-5)

## 3. TALENT MANIA

It was a non-technical event wherein participants showcased their hidden talents like singing skills, dance moves and various other entertaining acts.

Winner: 1<sup>st</sup>-SatishKamble (Extc-7)

2<sup>nd</sup>- MerrillGonsalves(Comps-5)

## 4. LEVEL UP

It was a funfilled event comprising of various levels and in each level contestants had to perform a series of tasks within a stipulated time.

Winners-HimaliMhatre and GauriHande (Elect-7)

## **MAINTENANCE WORKSHOP**

We as electrical engineering students remain so devoted to master ourselves in the field of transformers and motors that we are often oblivious to the working of day to day electrical home appliances. Keeping this in mind EESA conducted a maintenance workshop to enlighten the students about the working of daily appliances like Mixer Grinder, Electric Iron, Tube light and Ceiling Fan. Apart from learning the basic working, students even got a chance to dismantle the equipments and analyze their internal parts.

## **CRICKET TOURNAMENT**

Apart from techno cultural events, EESA also conducted a cricket tournament to incorporate team spirit and a sense of competitiveness among the students. Candidates from all the four years of the department enthusiastically participated in the matches.

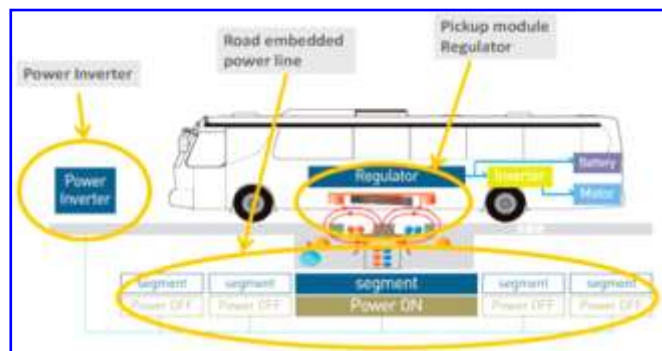
Winners – Electrical 2<sup>nd</sup> Year



## WIRELESS ONLINE ELECTRIC VEHICLES (OLEV)

Though the Hybrid Electric Vehicle was a major turning point in the field of clean and low-consumption transportation, its commercialization was seriously limited due to the price & weight of batteries, downtime for charging and the need for a separate charging infrastructure. The Korea Advanced Institute for Science & Technology (KAIST) addressed these concerns with the development of Online Electric Vehicles, which receive power through wireless electric power transfer from power strips buried under the road. For this, KAIST uses inductive coupling and a new technology called Shaped Magnetic Field in Resonance (SMFIR) that enables the electric vehicles to draw power wireless while on the go.

This technology requires inductive power cables or power strips to be buried 30 cm below the road surface and connected to the main grid. These power strips



need to be laid for only 5-15% of the total length of the road. This is advantageous since only a few segments of the road at regular intervals need to be rebuilt to accommodate the power strips. The input supply frequency is converted to a very high frequency at the inverter stage so that high frequency currents flow through the power strips. The frequency range of the inverter is 20-30 kHz. Magnetic flux is generated which is directly proportional to the current flowing through the cables. This magnetic field is shaped to reach the pick-up module which is mounted on the underside of the vehicle, using magnetic poles in the ground with shielding. To maximize the power pick-up, the pick-up unit under the vehicle is tuned to the frequency of the magnetic field. This is why this technology is called as Shaped Magnetic Field in Resonance. The induced AC voltage is regulated,

rectified and filtered and can either be fed to the prime-mover to drive the vehicle or for charging the DC battery. OLEV uses a small battery with size approximately one third of that used in typical electric vehicles thereby reducing the cost and weight of batteries.

As of today SMFIR supplies 60 kHz and 180 kW of power remotely to transport electric vehicles and the overall efficiency of this mechanism is around 80%. Research has also been made in order to extend the OLEV Technology to trains which would reduce maintenance costs as well as the need for power rails. The OLEV system which debuted in Seoul Grand Park in 2011 is now successfully deployed at several locations in Korea and has also penetrated the public transportation sector. OLEV which has appeared in “The Top 10 Emerging Technologies for 2013” could well be a stepping stone to the commercialization and widespread use of electric vehicles and a beacon to a greener tomorrow.

**By**

**Rhea Johnson (Elect-7)**



## **SWTCH FROM DC TRACTION TO AC TRACTION IN INDIAN RAILWAYS**

Indian Railways, considered to be one of the longest rail networks in the world, came into force on 16th April, 1853. The network has grown so rapidly that today its total length is 65,000 km. Electric traction has been preferred in most of the cases over other systems like steam and diesel owing to the fact that it is clean, efficient and suitable for handling heavy traffic density. It has been estimated that about 24,891 km of network has been electrified by the year 2014-15.

Supply for electric traction in Indian Railways started with 1500kV DC on 3rd February, 1925. During those days, DC traction was preferred in India because of the popularity of DC series motor over power electronic devices. As years passed, due to growth in the network and passengers, it became necessary to study the economic and technical feasibility of DC traction. The main disadvantage of DC traction is high energy consumption. With the increase in number of services, energy bill also escalated. Another negative aspect is that it consumed very high current which led to high voltage drop and losses. Hence a larger conductor size was required thereby increasing the cost of OHE. This was the main reason for having DC traction substation at an interval of 10-15 km (rough value). The substation cost would also increase as the incoming supply from the grid was AC. So it had to be stepped down, rectified and then fed for service. The transformer rectifier unit added more cost. The average speed of the locomotive or EMU was limited to 70-80 km/hr.

Considering these disadvantages, it became mandatory for the rail authorities to study the use of AC traction. Consequently, it was planned and commissioned to have 25 kV single phase AC for traction purpose. Here the greatest advantage is that the railway

authorities can just step down the voltage from the grid to 25 kV and feed it .Substation cost also reduced significantly as number of equipment was less. The 25 kV was then stepped down and rectified and was utilized depending upon the motor used for traction purpose. High voltage transmission reduces the conductor size, increases transmission efficiency and lowers voltage drop. Due to less voltage drop the distance between AC substations was 20-25km (roughly).With the introduction of AC traction,there has been saving in energy bill too. For instance, on converting the CST-THANE section from DC to AC, it is estimated that the energy bill will be roughly around 114 crores which is 30% lesser than DC. Also higher speed up to 100-120km/hr. can be achieved which reduces the travelling time.

Overall it can be concluded that AC traction is better than its DC counterpart provided appropriate care is taken regarding certain factors such as safety, interference with communication lines and other things related to protection. But this can be tolerated because considerable amount of energy conservation is obtained with AC traction.

**By**

**Rangarajan Swaminathan (Elect-7)**

## **MONORAIL – THE NEW ALTERNATIVE TO MUMBAI’S LIFELINE**

Today, during peak hours, where it can take up to two hours to cover a 20-km distance in commercial cities like Mumbai , the travel time for the same distance can be cut down to a mere 40 minutes on the commission of Monorail, which is widely accepted as a low cost transportation system. The monorail in Mumbai has a high potential to act as a substitute to the high capacity mass transit systems like suburban and metro services and hence add to the public transportation network in the city.

Modern monorails are based on a single solid beam that supports and guides the train; the carriages are either suspended beneath the track, or sit on top, with their wheels straddling electricity, which is carried on a ‘third rail’ either within, or connected to, the main beam. Conductive shoes on the carriages then transmit the current to the train. Magnetic levitation train (maglev) systems are built as straddle-type monorails, as they are highly stable and allow rapid deceleration from great speed. At high speed, maglev trains hover over the track and are not in physical contact with it. The maglev is the fastest train of any type, the experimental SC Maglev having recorded a speed of 581 km/h (361 mph). The commercial Shanghai Maglev Train has a record run at 501 km/h (311 mph).The straddle-beam design is the most widely used. The carriages have pneumatic rubber tyres, which drive along the top of an ‘I’-shaped beam. To prevent side-to-side swaying of the train, a series of smaller tyres clamp around the beam, providing general stability. Suspended monorails, meanwhile, hang underneath the track.

## SWITCHING:

With suspended monorails, switching may be accomplished by moving flanges inside the beam way to shift trains to one line or another. Straddle-beam monorails require that the beam moves for switching, which was an almost prohibitively ponderous procedure. Now the most common way of achieving this is to place a moving apparatus on top of a sturdy platform capable of bearing the weight of vehicles, beams and its own mechanism. Multiple-segmented beams move into place on rollers to smoothly align one beam with another to send the train in its desired direction.

## ADVANTAGES OF MONORAIL:

Unlike some trams and light rail systems, modern monorails are always separated from other traffic and pedestrians. They are both guided and supported via interaction with the same single beam. Monorails do not use pantographs and there are much fewer opportunities for collision. Unlike subways, monorail passengers enjoy sunlight and views. As with other systems, expensive and noisy ventilation systems are not necessary. (This also eliminates the weight and bulk of ventilation systems.) Monorails can be quieter than diesel buses and trains. They obtain electricity from the track structure.

## MONORAIL PROJECT IN MUMBAI:

The suburban local trains are the lifeline of Mumbai region, but in order to provide rail connectivity to inaccessible areas, the MMRDA has undertaken the monorail project. India's first monorail ran from Chembur to Wadala and from Wadala to SantGadgeMaharajChowk in central Mumbai by early 2013. The Mumbai Trans-Harbour Link MMRDA has also been entrusted with the task of developing the

22 km long trans-harbour link, which will link South Mumbai with Navi Mumbai. Given the rapid rise in population and economic boom in far flung areas of Virar in western suburbs and Alibaug in Raigad district, MMRDA would be connecting these two areas with a 126 km



multi-modal corridor, which will have an eight lane highway and a rail link for the faster movement of people.

It's really a way out and relief for Mumbaikars from traffic snarls which is highly capable of providing safety with luxury and on reducing the investment cost along with reduction in the time wasted in travelling , therefore turning out to be a better option for fast and efficient transportation.

**By**

**GauriHande(Elect-7)**

## ART N POETRY



By

**PrithvirajShetty**



### **She, the Woman.**

See the woman.

Silken threads that interweave Society's garment,

She shrouds his vanity in her delicate folds

and cradles his vulnerability in her silken drapes.

And at the sound of war-cry into shining armour transforms!

Woman, she is a contradiction!

Just as silk plays tricks with light, her beauty lies;

lies in lustrous hues that span love and lust and fury too.

She bespeaks grandeur locked in forgotten chests,

Brilliance lost on frayed hems;

hoping one day to wave her billows in freedom-scented wind.

But judge her fate, who would dare?

For her delicacy belies her strength.

The will surpassing steel she holds

And tongue of sharpest sword she hides in her royal robes.

Forgotten chests will unlock and handcuffs break.

She, the Woman.

**By- Rhea Johnson**

## **EESA 2014-15**

### **COUNCIL MEMBERS**

<b>MEMBERS</b>	<b>DESIGNATION</b>
<b>Arpit Bohra</b>	<b>Chairman</b>
<b>Chintan Patel</b>	<b>Secretary</b>
<b>Gaurav Wagh</b>	<b>Assistant Secretary</b>
<b>Jeny Ann Mathew</b>	<b>Treasurer</b>
<b>Dhirendra Pandey</b>	<b>Assistant Treasurer</b>
<b>Rangarajan Swaminathan</b>	<b>Chief Coordinator</b>
<b>John David</b>	<b>Program Coordinators</b>
<b>Kundan Shirke</b>	
<b>Sparsh Sehgal</b>	
<b>Samir Tikhe</b>	
<b>Saylee Koli</b>	
<b>Harshita Sathe</b>	
<b>Prithviraj Shetty</b>	
<b>Bhagyashree Pachbhai</b>	
<b>Nilanjana Nag</b>	<b>Magazine Editors</b>
<b>Shubham Kamble</b>	
<b>Zulfikar Khan</b>	
<b>Deepanjan Lamture</b>	<b>Sponsorship Heads</b>
<b>Shailesh Sharma</b>	
<b>Akshay Wadkar</b>	

COVER DESIGN BY- SHUBHAM KAMBLE

VISHAL ALKARI