NATIONAL ENGINEERING COLLEGE
(AN AUTONOMOUS INSTITUTION)
K,R,NAGAR,KOVILPATTI-628503.

EEE NEWSLETTER

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Volume 2 Issue 5

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

CONTENTS

STAFF ACHIEVEMENTS / ACTIVITIES

PUBLICATION:

R. V. Maheswari, Dr. P. Subburaj, B. Vigneshwaran, Dr. M. Willjuice Iruthayarajan, paper titled on "Support Vector Machine Based Denoising Technique for Removal of White Noise in Partial Discharge Signal", Electric Power System and Components, – Taylor and Francis, Vol.42, No.14. pp. 1611-1622, 2014.

R.V. Maheswari, Dr. P. Subburaj, B. Vigneshwaran, Dr. L. Kalaivani, paper titled on "Non Linear Support Vector Machine Based Partial Discharge Patterns Recognition Using Fractal Features", Journal of Intelligent and Fuzzy System, IOS Press, Vol.27, No.5. pp. 2649-2664, 2014.

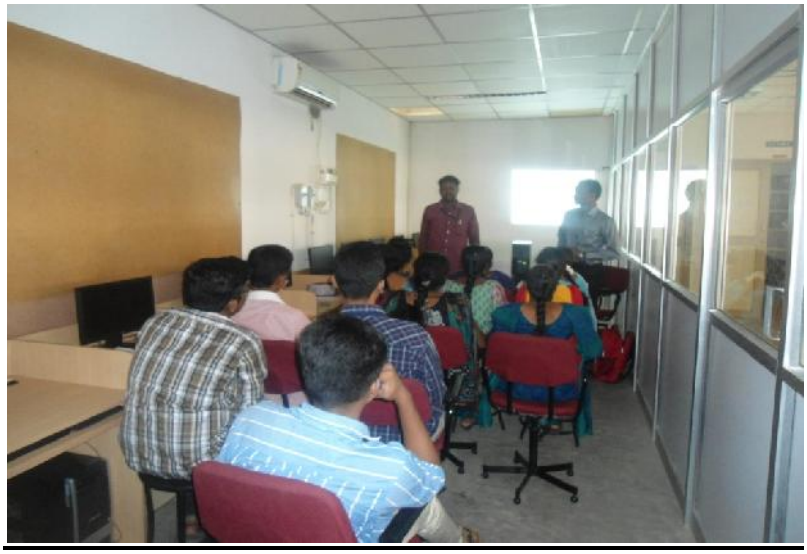
N. Murugan, B. Vigneshwaran, G. Kannayeram, R. V. Maheswari and Dr. M. Willjuice Iruthayarajan, paper titled on "Analysis of Stress Control on 33kV Non-Ceramic Insulators using FEM", Electric Power System and Components – Taylor and Francis. (Accepted for Publication)

S.No.	Name of the Staff	Events/Guest Lecture	Topic	Date	College
1	Dr.M. Willjuice Iruthayarajan, Prof & Head	One day Conference	New Paradigm in Higher Education - Research & Development - Education & Employability - Teaching & Learning	31st October 2014	FICCI, Tamil Nadu circle, Chennai
2	Mr.R.Muniraj, Asst. Prof (SG)	7 Days FDP Programme	Advanced Control Theory for Electrical Engineering Applications	13th to 18th October, 2014	CIT, Coimbatore.

DEPARTMENT ACTIVITIES

SPECIAL INTEREST GROUP

SHORT TERM LABVIEW TRAINING PROGRAMME ON BASIC CIRCUIT APPLICATIONS



Conducted by: Mr.R. Muniraj, AP (Sr.Grade) / EEE & Mr.M. Sivapalanirajan , AP/EEE

Session 1: 10.30 AM – 11.45 AM

LABVIEW- Laboratory Virtual Instrument Engineering Workbench is a system-design platform and development environment. It is used for interfacing user in control room to a field device connected in remote place. Such details of LABVIEW were discussed with students with the real time examples connecting the exact scenario in industries in control application.

Extending our discussion further in to the software handling, we explained two main LABVIEW windows like **Front panel and Block diagram**. Block diagram which is used for wiring our system design. It has various supporting tools like function palette and tool palette were discussed with its individual icon details useful for this training program.

The function palette option which is very much related to our program is Programming tool. It contains

- Numeric - arithmetic operators for developing mathematical expression
- Boolean - logical operators for control application
- Structure - looping arrangement for iterative operation
- Array - storage of data and proper retrieval if needed.
- Comparison - comparison operators used for checking

- String - alpha numeric character handling for user interface.
- Cluster - making use of various type of data together of system sophistication.

In Front panel the overall system can be interfaced to the user, which has control options in control palette. We also discussed respective icons in control palette like modern, silver, classic and express with their corresponding control icon options.

Session 1: 11.45 AM – 1.15 PM

Students were eagerly participated in the phase of developing their own LABVIEW design in this practical session of our training program. Two introduction experiments by the use of **Arithmetic operators and Boolean operators** were developed and tested as a part of our training program which includes

- ✓ To study, construct and simulate basic arithmetic functions for mathematical expression.
- ✓ To study, construct and simulate various logical functions using Boolean operation.
- ❖ To study, construct and simulate various control loops for iterative programs.
- ❖ To simulate and monitor parameters of circuit using mesh and nodal analysis.
- ❖ To simulate and monitor the response of RLC series and parallel circuits.

Student doubts related to these experiments during their execution in LABVIEW were appreciated. They were further motivated to make their design and development ideas in this domain. This short term program is scheduled to be conducted for II year EEE B section students on **every odd Saturday of this semester along with 2 regular working day evening from 5.15 PM to 6.15 PM** from September 20, 2014**.**

Number of shortlisted candidates: 16

Article by Staff Member

USEFUL IDEAS TO GET PLACED IN EMBEDDED INDUSTRIES

Ms.K. Gowthami
Assistant professor
Department of Electrical and Electronics Engineering
National Engineering College

Many students are not aware of the lucrative opportunities available in the field of Embedded Systems. Most graduates go after the popular **"IT" industry** to seek a good career. I think there are 2 reasons for this **1) lack of awareness 2) entry barrier.** While studying most students may come across the name "Embedded Systems". Apart from that they may not be aware of -"what is an embedded system", how do they work, what knowledge and skills should be acquired to build a great career in the field of embedded systems, which companies are working in this field etc etc. If it is in the case of computer science – the industry is readily known – the lucrative IT industry. The leading companies are Microsoft, Google, Adobe (product based) and there are many smaller and medium ones. There are service based IT firms like Wipro, Infosys, Accenture, Cognizant etc. Knowledge and skills required is mainly about programming languages and technologies – like Java, Asp.net, C & C++, Python, Php etc ., the list goes on. Entry barrier to the IT industry is very low. Any fresher with a basic skill and knowledge can get a job in this IT industry and that too with a decent entry level salary (well, that's not the case always!!)

When it comes to Embedded systems – do you know who all the leading players in this industry are? Let's have a look.

Samsung – They make mobile phones and gadgets, consumer electronics like washing machine, microwave oven, television, air conditioners etc. You must know that there are "n" number of competitors for Samsung who make similar products. All these products has embedded systems – with its own hardware and software. **For example:-** In an air conditioner functions like – 'intelligent room temperature control' will be controlled by the embedded device inside the air conditioner. This embedded device will be made of a microcontroller, its associated hardware and software for intelligent temperature sensing

Siemens – They make products in the field of medical electronics and automation industry.The products will be scanner, doppler, cardiograph machines, radiology machines etc etc.. its a big list.

Bosch – They make products for automotive industry.

I just mentioned 3 companies serving 3 different industries. There are thousands of other companies in the field of embedded systems – offering various kinds of services, consultation and product building.

Now we got an idea of companies that can offer a job in embedded systems. Now lets take a look at who all can opt for a career in embedded systems. The basic requirements will be a graduation/post graduation in electronics. There are many such courses offered by various kinds of universities. I will say, easy entry is for engineering degree holders in different streams of Electronics engineering – like Electrical and electronics, Electronics and communication, Electronics and instrumentation etc. Other degree holders in electronics like Bachelor of Science (Electronics as main), Master of Science (Electronics) as main can also opt for a career in Embedded systems.

Knowledge and skills required in these areas are- Good knowledge in theory and practical of one or two micro controllers like PIC, 8051, or AVR etc. Deep and sound knowledge in programming language C – especially embedded C. Knowledge in these 2 areas will help you to get an entry level job in the field of embedded systems. ***The real "learning curve" will only start at your first job*** – where you will deal with real issues and problem solving methods. After gaining much experience from the first job (may be a 2 years) you can always switch to big companies.

The trend we see here in India is, fresher's will boost their knowledge in these areas – especially in controllers and C programming by taking a good training after their graduation. The reason is an "outdated" and inefficient curriculum used by many universities in India. Even in an engineering course, there is only a single paper about microcontrollers. Most fresh graduates are unemployable in embedded systems (unless some mavericks build their own way up learning all themselves). To supplement this, fresh graduates take 3 or 6 months additional training. This will help them to land at an entry level job, usually in a medium level company. They gain more knowledge at this job and later switch to bigger ones like Bosch, Samsung etc.

FREQUENTLY ASKED INTERVIEW QUESTIONS WHILE EMBEDDED INDUSTRIES HIRING AN ENGINEERS

1. What is the need for an infinite loop in embedded systems?

Infinite Loops are those program constructs where in there is no break statement so as to get out of the loop, it just keeps looping over the statements within the block defined.
Example:

```
While(Boolean True) OR for(;;);
{
//Code
}
```

Embedded systems need infinite loops for repeatedly processing/monitoring the state of the program. One example could be the case of a program state continuously being checked for any exceptional errors that might just occur during run time such as memory outage or divide by zero etc., For e.g. Customer care Telephone systems where in a pre-recorded audio file is played in case the dialer is put on hold. Also circuits being responsible for indicating that a particular component is active/alive during its operation by means of LED's.

2. How does combination of functions reduce memory requirements in embedded systems?

The amount of code that has to be dealt with is reduced thus easing the overhead and redundancy is eliminated in case if there is anything common among the functions.

Memory allocation is another aspect that is optimized and it also makes sense to group a set of functions related in some way as one single unit rather than having them to be dispersed in the whole program. In case of interactive systems display of menu list and reading in the choices of user's could be encapsulated as a single unit.

3. A vast majority of High Performance Embedded systems today use RISC architecture why?

According to the instruction sets used, computers are normally classified into RISC and CISC.RISC stands for 'Reduced Instruction Set Computing' .The design philosophy of RISC architecture is such that only one instruction is performed on each machine cycle thus taking very less time and speeding up when compared to their CISC counterparts. Here the use of registers is optimized as most of the memory access operations are limited to store and load operations.

Fewer and simple addressing modes and simple instruction formats leads to greater efficiency, optimization of compilers, and re-organization of code for better throughput in terms of space and time complexities. All these features make it the choice of architecture in majority of the embedded systems. CISC again have their own advantages and they are preferred whenever the performance and compiler simplification are the issues to be taken care of.

4. Why do we need virtual device drivers when we have physical device drivers?

Device drivers are basically a set of modules/routines so as to handle a device for which a direct way of communication is not possible through the user's application program and these can be thought of as an interface thus keeping the system small providing for minimalistic of additions of code, if any.

Physical device drivers can't perform all the logical operations needed in a system in cases like IPC, Signals and so on… The main reason for having virtual device drivers is to mimic the behavior of certain hardware devices without it actually being present and these could be attributed to the high cost of the devices or the unavailability of such devices. These basically create an illusion for the users as if they are using the actual hardware and enable them to carry out their simulation results. Examples could be the use of virtual drivers in case of Network simulators, also the support of virtual device drivers in case a user runs an additional OS in a virtual box kind of software.

5. What is the need for DMAC in ES?

Direct memory access is mainly used to overcome the disadvantages of interrupt and program controlled I/O.

DMA modules usually take the control over from the processor and perform the memory operations and this is mainly because to counteract the mismatch in the processing speeds of I/O units and the processor. This is comparatively faster. It is an important part of any embedded systems, and the reason for their use is that they can be used for bursty data transfers instead of single byte approaches. It has to wait for the systems resources such as the system bus in case it is already in control of it.

6. What is Endianness of a system and how do different systems communicate with each other?

Endianness basically refers to the ordering of the bytes within words or larger bytes of data treated as a single entity.

When we consider a several bytes of data say for instance 4 bytes of data, XYZQ the lower byte if stored in a Higher address and others in successively decreasing addresses ,then it refers to the Big Endian and the vice versa of this refers to Little Endian architecture. Intel 80x86 usually follows Little Endian and others like IBM systems follow Big Endian formats. If the data is being transmitted care has to be taken so as to know as to which byte, whether the higher or the lower byte is being transmitted. Hence a common format prior to communication has to be agreed upon to avoid wrong interpretation/calculations. Usually layer modules are written so as to automate these conversions in Operating systems.

7. How are macros different from inline functions?

Macros are normally used whenever a set of instructions/tasks have to be repeatedly performed. They are small programs to carry out some predefined actions.

We normally use the #define directive in case we need to define the values of some constants so in case a change is needed only the value can be changed and is reflected throughout.

```
#define mul(a,b) (a*b)
```

The major disadvantage of macros is that they are not really functions and the usual error checking and stepping through of the code does not occur. Inline functions are expanded whenever it is invoked rather than the control going to the place where the function is defined and avoids all the activities such as saving the return address when a jump is performed. Saves time in case of short codes.

```
inline float add(float a,float b)
{
return a+b;
}
```

Inline is just a request to the compiler and it is upto to the compiler whether to substitute the code at the place of invocation or perform a jump based on its performance algorithms.

8. What could be the reasons for a System to have gone blank and how would you debug it?

Possible reasons could be,
- PC being overheated.
- Dust having being accumulated all around.
- CPU fans not working properly.
- Faulty power connections.
- Faulty circuit board from where the power is being drawn.
- Support Drivers not having being installed.

Debugging steps which can be taken are:

- Cleaning the system thoroughly and maintaining it in a dust-free environment.
Environment that is cool enough and facilitates for easy passage of air should be ideal enough.

- By locating the appropriate support drivers for the system in consideration and having them installed.

9. Explain interrupt latency and how can we decrease it?

Interrupt latency basically refers to the time span an interrupt is generated and it being serviced by an appropriate routine defined, usually the interrupt handler. External signals, some condition in the program or by the occurrence of some event, these could be the reasons for generation of an interrupt. Interrupts can also be masked so as to ignore them even if an event occurs for which a routine has to be executed.

Following steps could be followed to reduce the latency
- ISR's being simple and short.
- Interrupts being serviced immediately
- Avoiding those instructions that increase the latency period.
- Also by prioritizing interrupts over threads.
- Avoiding use of inappropriate APIs.

10. How to create a child process in Linux?

Prototype of the function used to create a child process is pid_t fork (void); Fork is the system call that is used to create a child process. It takes no arguments and returns a value of type pid_t. If the function succeeds it returns the pid of the child process created to its parent and child receives a zero value indicating its successful creation. On failure, a -1 will be returned in the parent's context, no child process will be created, and err no will be set The child process normally performs all its operations in its parents context but each process independently of one another and also inherits some of the important attributes from it such as UID, current directory, root directory and so on.

11. Significance of watchdog timer in Embedded Systems

Watchdog timer is basically a timing device that is set for predefined time interval and some event should occur during that time interval else the device generates a time out signal. One application where it is most widely used is when the mobile phone hangs and no activity takes place, in those cases watchdog timer performs a restart of the system and comes to the rescue of the users. It is used to reset to the original state whenever some inappropriate events take place such as too many commands being given at the same time or other activities that result in malfunctioning of the GUI.It is usually operated by counter devices.

12. If you buy some RTOS, what are the features you look for in?

-Deterministic operating system having guaranteed worst-case interrupt latency and context-switch times.
-Documentation providing for the minimum, average, and maximum number of clock cycles required by each system call.
-Interrupt response times should be very minute.
-Context switch time should be very low.
-Compatibility with several plug-in devices.
- Overall it should be very reliable.

13. Why is java mostly used in embedded systems?

Java was mainly designed and conceptualized for code that can work on different platforms without any hassles and also for being secure enough so as to not harm or corrupt other modules of code. Features like exception handling, simple syntax and Automatic Garbage collection all work in its favour as the language for use in ES's. Also that it is widely used in the form of Java applets makes it very popular confining it to the limits of JVM. It is Dynamic in nature. Its use is also being exploited in enterprise systems in the form of J2EE, J2SE J2ME in case of mobile applications.

14. Differentiate between mutexes vs semaphores

-Semaphores are a synchronization tool to overcome the critical section problem.

- A semaphore S is basically an integer variable that apart from initialization is accesses only through atomic operations such as wait () and signal ().

- Semaphore object basically acts as a counter to monitor the number of threads accessing a resource.
- Mutex is also a tool that is used to provide deadlock free mutual exclusion. It protects access to every critical data item. If the data is locked and is in use, it either waits for the thread to finish or awakened to release the lock from its inactive state.

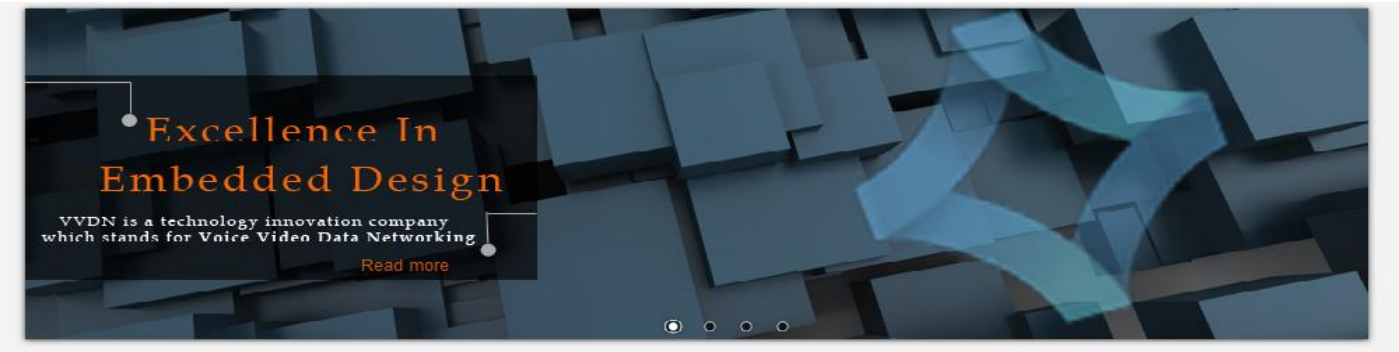
15. What are the commonly found errors in Embedded Systems?

- Damage of memory devices due to transient current and static discharges.
- Malfunctioning of address lines due to a short in the circuit
- Malfunctioning of Data lines.
- Some memory locations being inaccessible in storage due to garbage or errors.
- Improper insertion of Memory devices into the memory slots
- Faulty control signals.

16. What is the need for having multibyte data input and output buffers in case of device ports?

It's normally the case that some devices transfer the output either in a bursty or a sequential manner and also during input entry. If we take the example of keyboards, all the data entered is stored in a buffer and given at a time or one character at a time. In case of networking there may be several requests to access the same resource and all these are queued in a buffer and serviced in the order they are received hence to avoid the input/output units from getting overloaded with requests, we use multibyte buffers.

Placement Details



On behalf of Chairman, Managing Director, Director, Principal, Head of the Department and staff members, we heartily congratulates the final year student **Mr. K. Thivakar** who placed in VVDN Technologies Campus drive in our campus during the month of October 2014.

Mr. Thivakar.K

Success: *The thing always happens that you really believe in; and the belief in a thing makes it happen.*

- **Frank Loyd Wright**

Technical Articles by Students

WIRELESS POWER TRANSMISSION VIA SOLAR POWER SATELLITES:

A major problem facing Planet Earth is provision of an adequate supply of clean energy. It has been that we face" .three simultaneous challenges -- population growth, resource consumption, and environmental degradation -- all converging particularly in the matter of sustainable energy supply." It is widely agreed that our current energy practices will not provide for all the world's peoples in an adequate way and still leave our Earth with a livable environment. Hence, a major task for the new century will be to develop sustainable and environmentally friendly sources of energy.

Projections of future energy needs over this new century show an increase by a factor of at least two and one Half, perhaps by as much as a factor of five. All of the scenarios from reference 3 indicate continuing use of fossil sources, nuclear, and large hydro. However, the greatest increases come from "new renewable" and all scenarios show extensive use of these sources by 2050. Indeed, the projections indicate that the amount of energy derived from new renewable by 2050 will exceed that presently provided by oil and gas combined. This would imply a major change in the world's energy infrastructure. It will be a Herculean task to acquire this projected amount of energy. This author asserts that there are really only a few good options for meeting the additional energy needs of the new century.

One of the so-called new renewable on which major reliance is almost certain to be placed is solar power. Solar power captured on the Earth is familiar to all. However, an alternative approach to exploiting solar power is to capture it in space and convey it to the Earth by wireless means. As with terrestrial capture, Space Solar Power (SSP) provides a source that is

virtually carbon-free and sustainable. As will be described later, the power-collecting platforms would most likely operate in geosynchronous orbit where they would be illuminated 24 hours a day (except for short eclipse periods around the equinoxes). Thus, unlike systems for the terrestrial capture of solar, a space-based system would not be limited by the vagaries of the day-night cycle. Furthermore, if the transmission frequency is properly chosen, delivery of power can be carried out essentially independent of weather conditions. Thus Space Solar Power could provide base load electricity.

The major advantages are Unlimited Energy Resource, Energy delivered anywhere in the world, Zero fuel cost, Zero carbon-dioxide emission and Solar radiation can be more effectively collected in space. The disadvantages are Launch costs, Possible Health Hazards, Interference with Communications Satellites and Geo-Synchronous Satellites would take up large sections of space

- **R.FelshiyaRajakumari (Prefinal Year EEE)**

TECHNOLOGY, ENGINEERING & SCIENCE EXHIBITION 2014 (TESENEC'14)

National Engineering College (NEC), Kovilpatti has organized a two day technical science exhibition for school students on **"Technology, Engineering & Science Exhibition 2014" TESENEC'14** during 15th & 16th, October 2014. The **Inaugural Function of** TESENEC'14 was held on October 15th, 2014 at Department of Electrical and Electronics Engineering. The scope of the Exhibition is to bring out the innovative and technical ideas from the school students. Around 37 schools have participated and exhibited their innovations in the exhibition. Nearly 69 schools have visited our campus during exhibition. Total number of schools attended the exhibition is 106. Total number of projects exhibited in the function is 145. The various venues for the project exhibition in EEE departments were Electrical Machines Lab, Electrical Workshop Lab, Microprocessor and Microcontroller Lab, Applied Electronics Lab and Control and Instrumentation Lab.

TESENEC' 14 GALLERY

The following students of our department (Prefinal and Second year) were participated in the TESENEC' 14 Science Exhibition

S.NO	BATCH	TITLE OF THE PROJECT	YEAR
		PREFINAL YEAR	
1.	A. Praveen Balaji S. Pandiaraj Reddy S.Vijay M.S. Pranava Karthikeyan	Thermoelectric refrigerator	III-EEE
2.	R. Manikandan K. Muthu Kumar A. Anto Sharon Prakash	Life saver from electricity during floods	III-EEE
3.	R. Muneeswaran M. Gokul Sakthivel A. Mariappan K. Muthumanikandan	Intelligent traffic controller	III-EEE
4.	M. Rajkumar M. Pradeep G. Varatharajan	Home security using temperature sensor	III-EEE
5.	S. Ramasubramanian M. Shunmugaraj D. Ramkumaran	Automatic plant irrigation system	III-EEE
6.	S.M.K. Udaya Vijay R. Vishnu Vidya M. Rathna Priya	Automatic motor controller	III-EEE
7.	R. Sneha S. Selva Rani M. Sathya	Automatic Dim-Bright control for vehicle	III-EEE
8.	G. Selva Jothi V. Anitha F. Alma Margaret	Anti bag snatching alarm	III-EEE
9.	R. Sunitha M. Indumathy E. Revathi	Vehicle over speed indicator	III-EEE
10.	G.K. Archana Dharsini N. Bhuvaneshwari K. Karpagavalli J. Anitha	Active reflector for Pedestrians	III-EEE
		SECOND YEAR	
11.	P. Anandaraj M. Balasubramanian	Automatic water level controller	II-EEE

	S. Durai Pandian		
12.	M. Muthukani S. Afzal Ahamed P. Kali Muthu Kumar	Automatic street light controller using LDR	II-EEE
13.	M. Sudha S. Sripriya S. Priyadharsini	Rain alarm	II-EEE
14.	M. Poolammal P. Muthu Priya K. Prema	Automatic street light control	II-EEE
15.	S. Sathya N. Nandhini S. Vensiya	Automatic night lamp with morning alarm control	II-EEE
16.	R. Jesintha R. Bavithra B. Jerlin	Push –Pull amplifier	II-EEE
17.	A. Suvetha M. Muthuselvi G. Shiva Sankari	Lie Detector	II-EEE
18.	B. Shanmuga Nithya S. Sheeba Nancy Thangam S. Vigneshwari	Burglar alarm	II-EEE
19.	J. Manisha Mariel Raj G. Esakkiammal K. Kiruthika	Remote control for home appliances	II-EEE
20.	M. Venipriya K. Soundarya A. Primika	Gas leakage sensor	II-EEE

G. Varatharajan, M. Pradeep & M. Rajkumar

D. Ramkumaran, S. Ramasubramanian & M. Shunmugaraj

A. Anto Sharon Prakash, K. Muthu Kumar & R. Manikandan

R. Muneeswaran, M. Gokul Sakthivel, A. Mariappan & K. Muthumanikandan

Reddy S.Vijay, S. Pandiaraj, A. Praveen Balaji & M.S. Pranava Karthikeyan

M. Sudha, S. Priyadharsini & S. Sripriya

M. Indumathy, E. Revathi & R. Sunitha

S. Selva Rani, M. Sathya & R. Sneha

V. Anitha, F. Alma Margaret & G. Selva Jothi

R. Jesintha, S. Sathya & N. Nandhini

M. Poolammal, P. Muthu Priya & K. Prema

INDUSTRY VISIT

S.No.	Date	Accompany Staff Members	Place/Year
1	14.10.2014	Dr.M. Ravindran, Asso. Prof, Mrs.G. Shunmuga Lakshmi, AP & Mr.T. Siva Kumar, AP	1 MW SOLAR POWER STATION, Sivagangai. Second Year - A.
2	25.09.2014	Mr.N.B. Prakash, Asso. Prof, Mr.R. Muniraj, AP (SG)	WIND MILL, KAYATHAR Second Year -B
3	20.10.2014	Mr.S. Sankara Kumar, AP (SG), Mr.B. Venkatasamy, AP & Ms. S. Jayanthi, AP	KAYATHAR SUBSTATION, Prefinal Year - B

INDUSTRIAL VISIT - SECOND YEAR 'B'

INDUSTRIAL VISIT - THIRD YEAR 'B'

PERSONALITY TO KNOW

ROBERT ANDREWS MILLIKAN

Robert A. Millikan was honored with the Nobel Prize for Physics in 1923 for his measurement of the **elementary electronic charge** and for his work on the **photoelectric effect**.

Robert Andrews Millikan was born on March 22, 1868, in Morrison, Illinois. He was the first to earn a Ph.D. from physics department. Millikan's enthusiasm for education continued throughout his career, and he was the coauthor of a popular and influential series of introductory textbooks. which were ahead of their time in many ways.

In 1909 Millikan began a series of experiments to determine the electric charge carried by a single electron. The elementary charge is one of the fundamental physical constants and accurate knowledge of its value is of great importance. He began by measuring the course of charged water droplets in an electric field. The results suggested that the charge on the droplets is a multiple of the elementary electric charge, but the experiment was not accurate enough to be convincing. He obtained more precise results in 1910 with his famous oil-drop experiment in which he replaced water (which tended to evaporate too quickly) with oil. His experiment measured the force on tiny charged droplets of oil suspended against gravity between two metal electrodes. Knowing the electric field, the charge on the droplet could be determined. Repeating the experiment for many droplets, Millikan showed that the results could be explained as integer multiples of a common value (1.592×10^{-19} coulomb), the charge on a single electron.

In 1916 Millikan took up with similar skill the experimental verification of the equation introduced by Albert Einstein in 1905 to describe the photoelectric effect. He used this same research to obtain an accurate value of ***Planck's constant***. At the California Institute of Technology he undertook a major study of the radiation that the physicist Victor Hess had detected coming from outer space. Robert Millikan was Vice Chairman of the National Research Council during World War I. During that time, he helped to develop anti-submarine and meteorological devices. He received the Chinese Order of Jade. Millikan died of a heart attack at his home in San Marino, California in 1953 at age 85, and was interred in the "Court of Honor" at Forest Lawn Memorial Park Cemetery in Glendale, California.

Fullness of knowledge always means some understanding of the depths of our ignorance; and that is always conducive to humility and reverence.

- M. Pranava Karthikeyan (Prefinal Year EEE)

Students Experience in Preparing and Facing Interviews:

Ms. Archana. M.S – TCS Placed, Final Year

I was really glad to say that I have achieved my aim to get placed in TCS. I started to prepare aptitude from my second year itself. Great efforts were taken by our placement coordinators than me. I have no words to thank them. They have given so many materials and model question papers for preparation. They induced me a lot and created awareness. Apart from all the efforts it was only due to God's grace. First round was written test which comprises of e-mail writing for 10 minutes and aptitude questions for 70 minutes. The questions were quite easy. Then I was selected for the second round for interview. It was a wonderful experience that I ever faced. Self introduction, C program, Microprocessors, area of interest, projects are some of the areas from where they asked questions. I was confident and clear in my answers and that is what they expected. At last they spoke to me about terms and conditions and asked me whether I was okay with it or not. Thus aptitude and communication skills are needed to get placed in TCS. I wish you a very best for all my juniors. Success is yours.

Ms. Sudha. S – TCS Placed, Final Year

It was an immense pleasure to share my interview experience in TCS. The first round was the written test comprising of two parts, email writing &aptitude .The email writing is simple. We have to write an email with minimum of 50 words within 10 minutes .In aptitude, it had 30 questions .It also had negative marks for wrong answers .The aptitude had only numerical problems. It had neither verbal nor technical questions. The selection criteria were based on both email writing &aptitude. The second round was interview. In the interview, I was asked about C questions especially string operations, memory allocations and also to write a C program. Then I was asked about the workshop that I had attended and the paper presented. They asked some general questions like being electrical why I choose software. They also asked me whether I was okay with relocation or not. Whatever may be the answer, be confident and clear to explain that. The Communication skills and C knowledge are the most expected things of them .Being electrical, they mainly concentrate on C & C++only. Regarding aptitude, tedious preparation is needed to clear this round. TCS is the company which had only two rounds in its selection process .So I would like to convey the students to have more practice in aptitude and concentrate more on communication skills and C language. ALL THE BEST!

TIME TO KNOW OUR ALUMNI

NANDA KUMAR R
Bachelor of Engineering in Electrical & Electronics Engineering

E-mail ID: *nnnanda.2210@gmail.com*
Contact: +91-7639491675
Current Status: Electrical Engineer
Batch: *2008 – 2012*

WORKING DETAILS

RKM Powergen pvt. Ltd

Designation	:	Electrical Engineer.
Duration	:	May 2012 – May 2014
Project	:	4*360 MW Thermal Power plant
Location	:	Chhattisgarh

- Maintenance of 33/11 KV and 11 KV/440 V substation transformers, VCB panels, 1010 KVA DG sets, plant lighting, plant power supply, UPS and Control Panel equipment.
- Specifications for Electrical Wiring Accessories & Components (Switches & Sockets, Disconnect Switch, Wires & Cables and Installation Methods, Circuit Breaker, Switchgears, Panel Boards, RCD, Capacitor Bank, Transformer, UPS/ Inverter etc.).
- HT/LT power cables Jointing and Termination work inspection and guidance.
- Troubleshooting and maintenance of Motors used in plant.
- Preparation of Distribution Board connections

In Tower crane Team

- Plant Tower crane erection coordination with mechanical team, Trolley motor, Swing motor Hoist motor Maintenance.
- Hoist control panel and Main control panel Troubleshooting and problem rectification.
- EOT crane erection coordination with mechanical team and Variable Frequency Drive (VFD) panel wiring with maintenance.
- Electrical boom lifters and Scissor lifter's electrical circuit wiring troubleshooting and problem rectification.

In TG Team

- 133KVA Generator Transformer Erection Coordination.
- 133KVA Pre commissioning Test coordination.

In GIS Team

- Gas Insulated Switchgear room Construction Inspection.
- Gas insulated Switchgear materials storage Inspection.

DO IT!!! KNOW IT!!!

A. Anto Sharon Prakash - Prefinal Year

JOURNEY OF ELECTRICAL ENERGY

When we come across several places across the country, we can find a common thing i.e the cables, which are running all over. They will carry some energy in it according to the needs. We are quite familiar with the high tower s holding heavy wires. We can see them, especially during our journeys in the highways. Little children would look at them in surprise. We would also be in amazement. We don't know it's starting and ending. So, to make us aware about this TRANSMISSION SYSTEM which have very high voltage in it, let us try it in our own. For that we require,

1. Device that generates electrical energy from solar power.

2. Inverter

3. Step up transformer

4. Step down transformer

5. Load (electrical motor, light bulbs, etc)

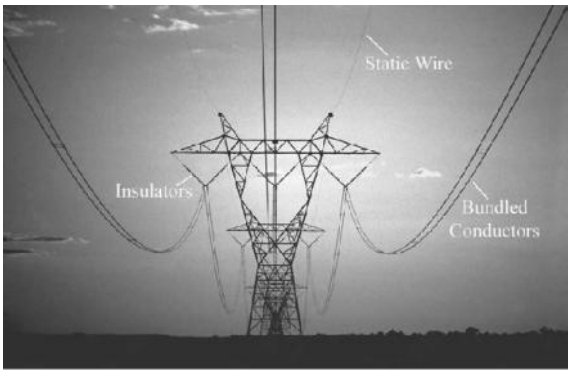
SELECTION:

When we see the transmission line, which are so up our heads we would normally be in amazement and then ignore it. We can realize that we are not aware of many of the things that happen around us. But to make our path to lead to success we have to be completely aware of the happenings around us. Without awareness, there would be utter confusion in our path to goal. So to create the habit of awareness in us, the thing which is ignored without knowing what it is, the transmission of electrical energy is selected and thus we can create the best path ending at our goals.

PRINCIPLE BEHIND (written by **Steven W. Blume**):

Why use high-voltage transmission lines? The best answer to that question is that high-voltage transmission lines transport power over long distances much more efficiently than lower-voltage distribution lines for two main reasons. First, high-voltage transmission lines take advantage of the power equation, that is, power is equal to the voltage times current. Therefore, increasing the voltage allows one to decrease the current for the same amount of power. Second, since transport losses are a function of the square of the current flowing in the conductors, increasing the voltage to lower the current drastically reduces transportation losses. Plus, reducing the current allows one to use smaller conductor sizes. Figure shows a three-phase 500 kV transmission line with two conductors per phase. The two-conductors-per-phase option is called *bundling*. Power companies bundle multiple conductors—double, triple, or more—to increase the power transport capability of a power line. The type of insulation used in this line is

referred to as *V-string* insulation. V-string insulation, compared to *I-string* insulation, provides stability in wind conditions. This line also has two *static wires* on the very top to shield itself from lightning. The static wires in this case do not have insulators; instead, they are directly connected to the metal towers so that lightning strikes are immediately grounded to earth. Hopefully, this shielding will keep the main power conductors from experiencing a direct lightning strike.



Source: Photovault.

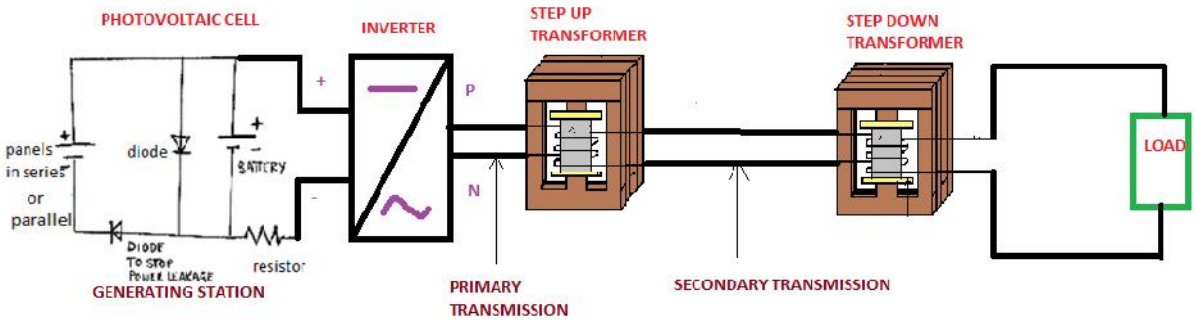
WHAT WE ARE GOING TO DO?

1. Find out the output of all the components.

2. To check out for any latest and innovative methods.

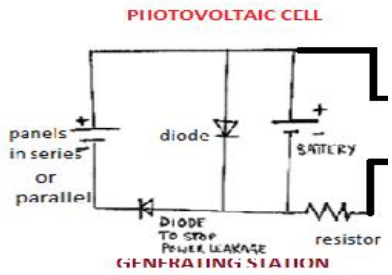
3. To check for any alterations to improve the efficiency.

PROJECT DIAGRAM:

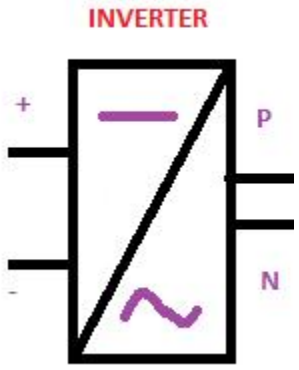


Generating station circuit source: Internet

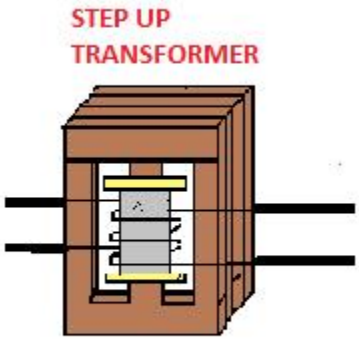
PROJECT COMPONENTS EXPLANATION:



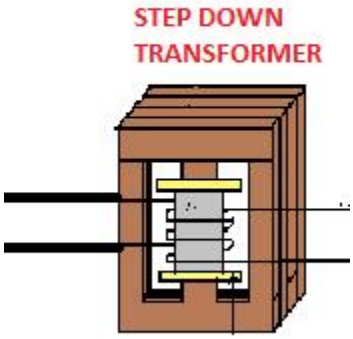
Transmission lines require energy to be transmitted. This generating station converts solar energy into electrical energy which has to supply to the consumers.



Many of our electrical appliances operate on AC and long distance transmission of electrical energy depends on AC at the economic point of view. This inverter is used here to convert the DC vo0ltage from battery into AC voltage.



When power is transmitted at high voltages the losses are minimized. So to increase the voltage to a higher value the step up transformer is used.



At the consumer side or distribution side, only a certain level below the transmission level of voltage is required. Therefore, here the step down transformer is used to decrease the voltage.

Note:

1. In real life applications not only solar energy but also other type of energies can also be used to obtain electrical energy.

2. The transformers carry high voltage. So handle it with care.

Have you obtained high and low voltage at the output side of step up and step down transformers respectively? Have you made the load to run receiving power via the transmission lines? Try to answer these questions.

Students Achievements

Mr.P. Sathyanathan from III Year 'B' section was participated in a army attachment camp in Secunderabad (A.P) from 1.09.2014 to 15.09.2014.

Mr.P. Shunmugam from III Year 'B' section got first prize in paper presentation topic on "Making our Engineering as world class" conducted by Institute of Engineers (INDIA) Tamil Nadu State Centre, on 14.09.2014 in Chennai.

Second Year 'A'

S.No.	Name	Event	Venue	Awards	Date
1	N.Deepan Raj M.Jegan	Quiz	IE, NEC	**1st Prize**	13.10.2014
2	J.Aksha K.Maheswari	Paper Presentation	Rotract club, NEC	Participation	10.10.2014
3	S.Kirthika	Paper Presentation	Rotract club, NEC	Participation	10.10.2014
4	R.Bavithra	Paper Presentation	Rotract club, NEC	Participation	10.10.2014
5	R.Hari Sankar & S.Ganapathy Vinayagam	Quiz	IE, NEC	Participation	13.10.2014

Second Year 'B'

S.No.	Name	Event	Venue	Awards	Date
1.	Muthuselvi M & Suvetha A	Paper Presentation	National Engineering College, IE(I)	**1st Place**	19.8.14
2	Soundarya K Shanmuga Nithya B	Quiz	National Engineering College, JAYCEE	**2nd Place**	11.9.14
3	Shanmuga Nithya B	Poem Writing	National Engineering College, NCC	**3rd Place**	20.9.14
4.	Zainy Mohammed Yousuf S	Paper Presentation	Mepco Schlenk Engineering College	**4th Place**	18.10.14

Third Year 'A'

WORKSHOP

NAME	TOPIC	COLLEGE	DATE
S.P.Atul Krishna G.Aneruthmani M.Balakrishnan B.Alwyn Praphu J.Antony Iruthayaraj A.Daniel preveenraj A.Arun R.Muthukarthik M.Muralikumar	CAD modelling and PLM	Vellore Institute of Technology, Vellore	26-9-2014 to 27-9-2014

SPORTS

NAME	SPORT	COLLEGE	DATE
M.Manogari	Basket Ball	Sivanthi Adithanar College of Engineering, Tiruchendur	24-9-2014 to 25-9-2014

NAME	EVENT	COLLEGE	REWARDS
K.Arunkumar	NCC-Quiz	National Engineering College, Kovilpatti	**First prize**
	NSS-Quiz		**Second Prize**
K.Arunkumar M.Manikandan	IE- Quiz	National Engineering College, Kovilpatti	**Third Prize**

PAPER PRESENTATION

NAME	TOPIC	COLLEGE	DATE
P.Amarnath M.Gurusamy	Smart Grid	Kamaraj college of engineering and technology, virudhunagar	9-10-2014

Third Year 'B'

S.NO	NAME	EVENT	VENUE	REWARDS	DATE
1.	C.Subashini	Free Hand Sketching	National engineering college, Kovilpatti	**2nd Prize**	23-09-2014
2.	P.Selvam	Interzonal Power Lifting (Weight Lifting)	Kongu Nadu College of Engineering	**4th Prize**	18-09-2014
		Dead Lifting		**3rd Prize**	
3.	P.Shanmugam	12km Mini Marathon	Dr. Sivanthi Adithanar College of Physical Education, Thiruchendur	**7th Prize**	10-09-2014
4.	M.Ratna Priya	ANIMATE	National engineering college, Kovilpatti	Participation	24-09-2014 & 25-09-2014
5.	P.SathyaBama	ANIMATE		Participation	
6.	R.VisnuVidya	ANIMATE		Participation	
7.	U.ShanmugaPriya	ANIMATE		Participation	
8.	B.SivaRanjani	ANIMATE		Participation	
9.	C.Pradeepa	ANIMATE		Participation	
10.	P.Shanmugam & M.S.Pranavakartikeyan	Paper Presentation (Title: Real time implementation of railway track fault detection system)	PSG Engineering College, Coimbatore.	Participation	1-10-2014& 2-10-2014
11.	R.Sunitha M.Indhumathy E.Revathi SnehaPremaLochini	Hand Ball	Bharathidasan Engineering College,Trichy	Participation	17-09-2014 & 18-09-2014

Final Year

SL.NO.	NAME	EVENT	VENUE	REWARDS	DATE
1.	A.Karthickumar, S.Abul Hassan	Paper Presentation	PHASOR 2K14, Francis Xavier Engineering College, Tirunelveli	Participated	28.08.2014
2.	P.Muthu Kumar	Zonal level Volley ball	P.S.R. Engineering College, Thiruvengadam.	Participated	12.09.2014
3.	J.Inancia	Zonal level Volley ball	G.U.Pope Engineering College, Tuticorin	Participated	09.10.2014
4.	K.Kattabomman	Zonal level Ball Badminton	Jayaraj Annapackiam Engineering College, Nazaraith	Participated	09.10.2014

CRACK GATE

Ms.S.Divya

AP/EEE, NEC

AC Machines

1. In a transformer, zero voltage regulation at full load is
(a) Not possible
(b) Possible at unity Power factor load
(c) Possible at leading Power factor load
(d) Possible at lagging Power factor load

Ans:C

2. A single phase 10kVA, 50 Hz transformer with 1kV primary winding draws 0.5A and 55W, at rated voltage and frequency, on no load. A second transformer has a core with all its linear $\sqrt{2}$ times the corresponding dimensions of the first transformer. The core material and lamination thickness are the same in both transformers. The primary windings of both the transformers have the same number of turns. If a rated voltage of 2kV at 50Hz is applied to the primary of the second transformer, then the no load current and power, respectively, are

(a) 0.7 A,77.8W
(b) 0.7A,155.6 W
(c) 1A,110W
(d) 1A,220W

Ans:B

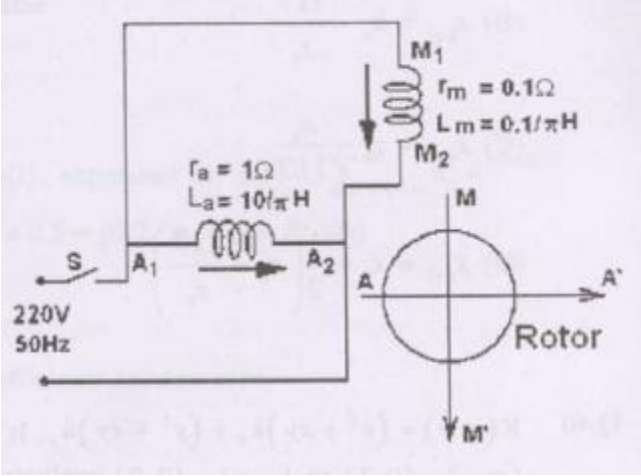
3. The locked rotor current in a 3-phase, star connected 15kW, 4-pole, 230V, 50Hz induction motor at rated conditions is 50A. Neglecting losses and magnetizing current, the approximate locked rotor line current drawn when the motor is connected to a 236V, 57Hz supply is

(a) 58.5A
(b) 45.0A
(c) 45.7A
(d) 55.6A

Ans: B

4. A 220V,50Hz,single-phase induction motor has the following connection diagram and winding orientations shown.MM' is the axis of the main stator winding(M_1M_2) and AA' is that of the auxiliary winding (A_1A_2). Directions of the winding axes indicate direction of flux when

currents in the windings are in the directions shown. Parameters of each winding are indicated. When switch S is closed, the motor [GATE]



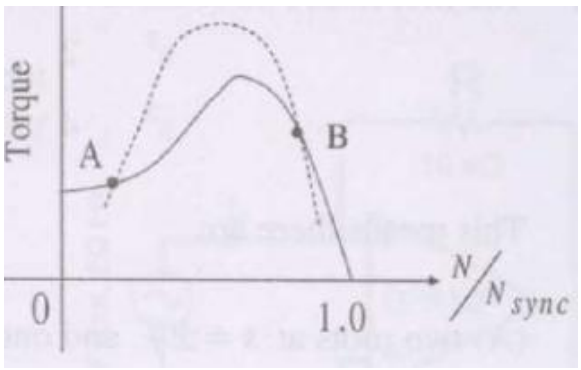
(a) Rotates clockwise
(b) Rotates anticlockwise
(c) Does not rotate
(d) Rotates momentarily and comes to a halt

Ans:C

5. If an induction machine is run at above synchronous speed, it acts as
(a) A synchronous motor
(b) An induction generator
(c) An induction motor
(d) None of the above

Ans: B

6. A 3-phase squirrel cage induction motor supplied from a balanced 3-phase source drives a mechanical load. The torque-speed characteristics of the motor (solid curve) and of the load (dotted curve) are shown. Of the two equilibrium points A and B, which of the following options correctly describes the stability of A and B? [GATE 2009]



(a) A is stable B is unstable
(b) A is unstable B is stable
(c) Both are stable
(d) Both are unstable

Ans: B

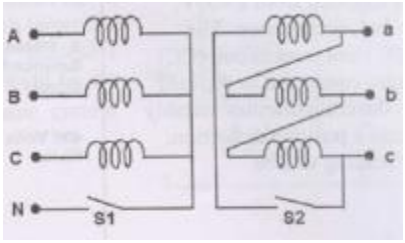
7. The thrust developed by a linear induction motor depends on
(a) Synchronous speed
(b) Rotor input
(c) Number of poles
(d) Both A and B

Ans: D

8. Star- delta starter of an induction motor
(a) Inserts resistance in rotor circuit
(b) Inserts resistance in stator circuit
(c) Applies reduced voltage to rotor
(d) Applies reduced voltage to stator

Ans: D

9. star-delta transformer shown above is excited on the star side with a balanced,4-wire,3-phase,sinusoidal voltage supply of rated magnitude. The transformer is under no load condition.



With both S1 and S2 open, the core flux waveform will be
A. A sinusoidal at fundamental frequency
B. Flat-topped with third harmonic
C. Peaky with third-harmonic
D. None of these

Ans:B

10.The primary winding of a transformer has 110 V ac across it. What is the secondary voltage if the turns ratio is 8?

A.8.8 V
B.88 V
C.880V
D.8, 800 V

Ans: C

11.To step 110 V ac down to 20 V ac, the turns ratio must be

A.5.5
B.18
C.0.18
D.0.018

Ans: C

12. How many primary volts must be applied to a transformer with a turns ratio of 0.1 to obtain a secondary voltage of 9 V?
A.9V
B.90V
C.900V
D.0.9V

Ans: B

13. In a synchronous motor, damper winding is provided to
A. Stabilize rotor motion
B. Suppress rotor oscillations
C. Develop necessary starting torque
D. Both B and C

Ans: D

14. Synchronous capacitor is
A. An ordinary static capacitor bank
B. An over excited synchronous motor driving mechanical load
C. An over excited synchronous motor running without mechanical load
D. None of the above

Ans:C

15. A synchronous machine is called as doubly excited machine because
A. It can be over excited
B. It has two sets of rotor poles
C. Both its rotor and stator are excited
D. It needs twice the normal exciting current

Ans: C

EEE NEWSLETTER

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