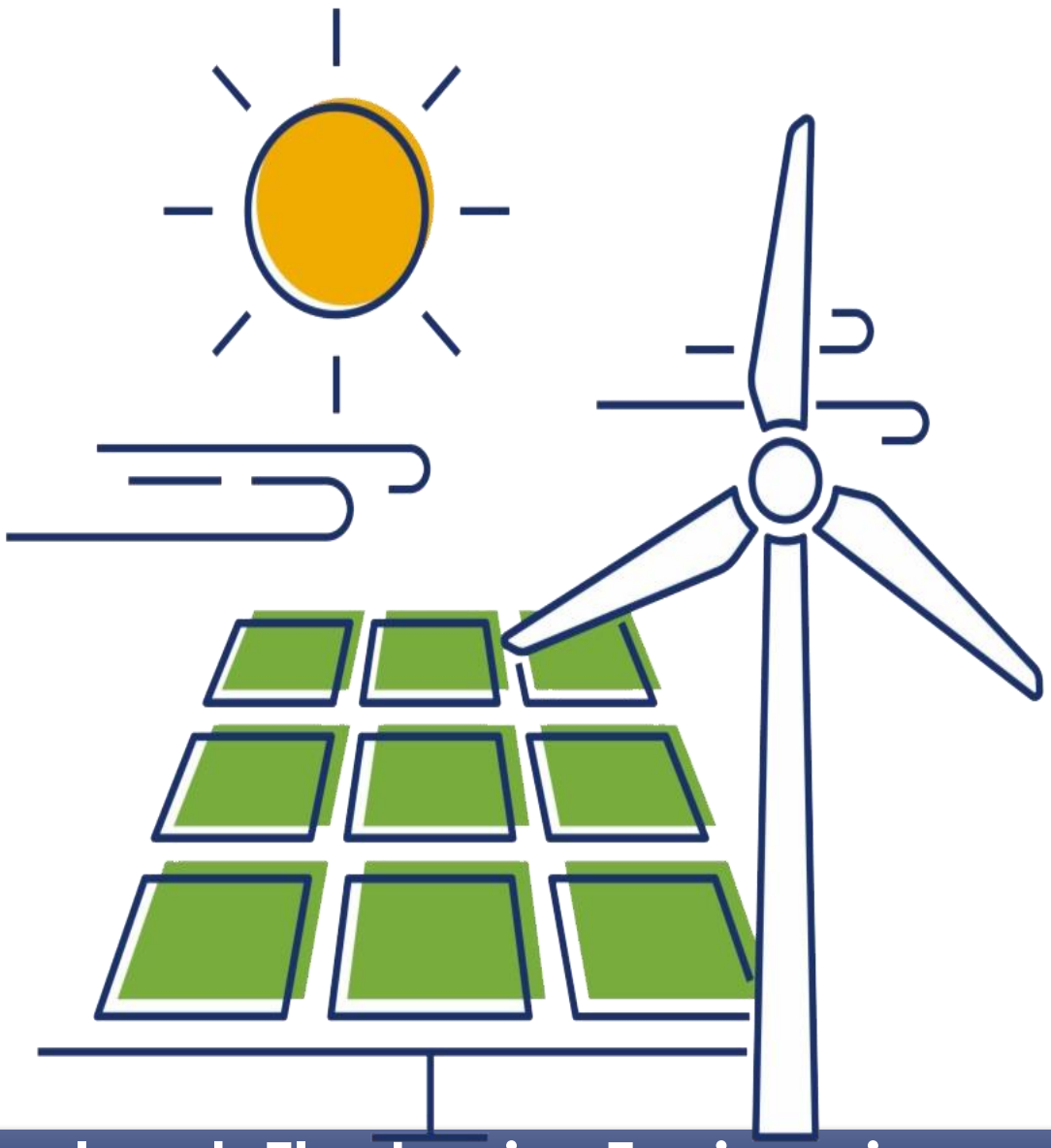
E-VIDYUT

VOLUME-12 I NOV 2018



Electrical and Electronics Engineering

Gandhi Institute For Technology, Bhubaneswar

INDEX

Principal Message

Dr. S. Krishna Mohan Rao
Principal, GIFT, BHUBANESWAR

It truly is a matter of deep pride and elation for me to learn that the students of the Electrical and Electronics Engineering Department have produced the 12th the edition of this technically magnificence known as "E-VIDYUT". This magazine has succeeded in its endeavors to keep the students well informed about the innovation of the ever transient field of technology. Our students have proved that the literary prowess can go hand in hand with technical mastery, thus enabling accomplishment of the GIFT goal of all round development of a student. I hope that students would continue to keep the brilliant torch of E-VIDYUT bright in the future as well.

Head of the Department Message

Prof, Ganesh Prasad Khuntia
HOD/EEE, GIFT, BHUBANESWAR

I am proud to see that the students of our department have put in appreciable effort into creating the magazine, E-VIDYUT. It is good to see that today's generation has not lost its literary roots, despite the perpetual efforts of e-Technology to extinguish the flames of the written word. This magazine is Exceptional proof that the literary flame is burning bright and is the piece de resistance of the annual calendar of our department. I look forward to seeing the juniors taking up the reigns of this magazine in future, so that this tradition remains eternal

From Chief Editor

Prof. Srikanta Kumar Dash
Faculty
Gandhi Institute For Technology, Bhubaneswar
Phone No .-7873008156
Email Id.- srikanta@gift.edu.in

I feel privileged in presenting the second issue of our Department Magazine E-VIDYUT. I would like to place on record my gratitude and heartfelt thanks to all those who have contributed to make this effort a success. My special thanks to Principal for his guidance which enabled me to bring out this volume-12. It is my moral duty to thank him for giving support and encouragement and a free hand in this endeavor. Last but not the least I am thankful to all the authors who have send their articles and readers who made this magazine so popular.

Editorial Board

FACULTY WING

1. Prof. Srikanta Kumar Dash
2. Prof. Sudhansu Bhusan Pati
3. Dr. Sujit Kumar Panda
4. Prof. Sushree Shataroopa Mohapatra
5. Prof. Rojalin Rout
6. Dr. Satyajit Mohanty

STUDENT WING

1. Truptimayee Nayak (3rd yr)
2. Ashutosh Mishra (3rd yr)
3. Prasad Maharana (2nd Yr)
4. Nupur Patra (2nd yr)

About Department

The Department of Electrical and Electronics Engineering was established in the year 2007. It aims at producing qualified engineers in the areas of electrical machine, power electronics, control system, power system, and instrumentation. The field of Electrical and electronics is advancing at a very rapid pace. Power electronics has taken the center stage in every area be it power systems, control systems, power quality, etc. The department is well equipped with a group of highly qualified and dynamic teachers. It boasts of laboratory facility to be one of the best in the state. The students are encouraged and motivated to take up challenging projects. Summer training, industrial visit and projects are carefully planned for the students to remain updated with the technology trend. Seminars and short courses are regularly organized to update the students with the latest in the education and industry trends.

Vision of the Department

To create a distinctive culture, that could enable students and faculty members collaboratively approach to advance their knowledge about recent advancements in the core domains of electrical and electronic engineering such as power electronic, smart grids, renewable energy etc., and develop effective, implementable and environment friendly solutions towards solving the energy vs. sustainability crisis for present and future society.

Mission of the Department

- To create a culture of research and Innovation through necessary collaboration with the premier institutions to purse career in research.
- To develop a distinctive environment where student, teacher can learn and acquire necessary knowledge and skills through effective collaborations and holistic interactions.
- To create a conducive ambience where students and faculty members can engage themselves for developing effective solutions for recent as well as prominent future challenges in the area of energy generation, transmission and distribution.
- To Generate a Pool of eco-pruners and entrepreneurs with the ability to address the industry and social problems and should be able to provide weight age towards Society and sustainable energy issues

Philip Diehl

Thomas Carlyle is said to have written: "The history of the world is the biography of great men." Upon reflection one must conclude that there is much truth in that statement. This brief write-up concerns one man who contributed significantly to technical developments in different areas as well as in one specific area in which he was at least one hundred years before the time the world would pursue that invention.

Philip H. Diehl (29 Jan 1847 - 7 Apr 1913) was born in Dalsheim, Germany. At the age of 21, in July, 1868, he emigrated to New York City where he worked in several machine shops. Then, in that same year, he found employment with the Singer Manufacturing Company in New York City. In 1870 or 1871 he went to work at the Remington Machine Company in Chicago and stayed there until 1875. In 1871 the great Chicago fire occurred and it is said that Diehl had a narrow escape from death; he lost all his belongings to the fire. In 1875 Diehl took charge of experimental work in the improvement of sewing machines in the Singer plant in Elizabeth, New Jersey. This was not a trivial job because by 1897 Singer was manufacturing nearly one million machines a year, including 53 different constructions and 360 varieties of machines. These included the ordinary machine for family use and various types for manufacturing, including machines with 12 needles operated by steam or electricity.

On the fiftieth anniversary of the development of the incandescent lamp by Thomas Edison a celebration was held in Dearborn, Michigan at the new Henry Ford Museum. About that same time an article appeared in the Elizabeth, New Jersey newspaper about work that had been performed by Philip Diehl. "Diehl's spare time was given to his electrical experiments, most of which were carried out in his home in Orchard street, but the problems that fascinated him were the improvements on the Singer machines on which he was working.

"Philip Diehl was born in Dahlsheim, Hesse-Darmstadt, Germany, January 20, 1847, where he received his education. Apparently his time in school was well spent, but his interest in things mechanical overshadowed his interest in scholastic studies and when 21 years old he came to New York, where he obtained a position with the Singer Manufacturing Company as an apprentice. After working there two years he was transferred by the company to their Chicago plant and while there passed through the horrors of the Chicago fire in 1871. Shortly after that he came to Elizabeth for the company, where he remained until he died in April, 1913, and where he carried on most of his experiments that brought about the founding of the Diehl Company.

"He had been married in Chicago, and he and his wife went to live on the country lane that is now Orchard street. Later they moved to 508 Morris avenue, and still later in the house at 528 Morris avenue (in which his)? daughter, Mrs. Max H. Keppler, now lives with her husband and family.

SMART DUST TECHNOLOGY

Rashmita Rani Panda
Faculty

Smart dust is a system of many tiny microelectromechanical systems (MEMS) such as sensors, robots, or other devices, that can detect, for example, light, temperature, vibration, magnetism, or chemicals. They are usually operated on a computer network wirelessly and are distributed over some area to perform tasks, usually sensing through radio-frequency identification. Without an antenna of much greater size the range of tiny smart dust communication devices is measured in a few millimeters and they may be vulnerable to electromagnetic disablement and destruction by Microwave exposure. How this can be used ? AND what could be its use ? using satellites and GPS technology we are now able to now create a live map of the whole earth. And we are getting the instantaneous position of anything that we require. But its limitations are that we can't get all kinds of physical information of any targeted areas like radiation contamination, temperature, pressure seismic activities etc. We can just estimate these measures by observing from satellites. BUT these ground based smart dust can create a realistic mapping of targeted areas sensing anything we require and throwing all information to master servers. We need to disperse this dust in billions of numbers in any region. And through EMW this things keep on relaying in formation to the mother device which the relay it to either satellite or To servers where we can collect and process it.

I believe this thing would be a really successful technology in mapping and knowing the conditions of other planet such as mars where we cant deploy a dozen of satellites. And it would be play a important role on finding life or living conditions in planets like mars.

A new twist to optical communications

Rojalin Rout
Assistant Professor

An optical component that can detect twisted light could lead to much higher capacity optical transmission systems. But significant technical hurdles must be overcome before such systems can be deployed in operators' networks. One important step towards such systems has been demonstrated by physicists at the Harvard School of Engineering and Applied Sciences. The team has developed a generalized coupler that converts free space beams to a metal surface by inducing a surface wave known as a surface plasmonpolariton (spp).

Converting a free space beam

Dr Satyajit Mohanty
Assistant Professor (Asst HOD)

"**Th**e idea of our work is inspired by the principle of holography," said Patrice Genevet, research associate at Harvard University. "We designed a metallic interface a coupler that converts a free space beam with a complex wave front into a propagating surface plasmonpolariton."

Anspp is an electromagnetic wave that propagates at the interface between a dielectric – in this case, free space and a metallic film, and is an important element in the emerging field of nano photonics. "These waves propagating at the surface are complicated to couple to; you have to play some tricks," said Genevet.

Sixth sense technology

Truptimayee Nayak
3rd yr Student

Sixth Sense' is a wearable gestural interface that augments the physical world around us with digital information and lets us use natural hand gestures to interact with that information. Steve Mann is considered as the father of Sixth Sense Technology who made wearable computer in 1990. Every one of us is aware of the five basic senses – seeing, feeling, smelling, tasting and hearing. Whenever we encounter a new object/experience our natural senses tries to analyze that experience and the information that is obtained is used to modify our interaction with the environment. But in this new age of technologies the most important information that helps one to make right decision is something that cannot be perceived and analyzed by our natural senses. That information is the data in the digital form, and it is available to everyone through sources like internet. The sixth sense technology concept is an effort to connect this data in the digital world in to the real world. Sixth Sense is a wearable "gesture based" device that augments the physical world with digital information and lets people use natural hand gestures to interact with that information. It was developed by PRANAV MISTRY, a PhD student in the Fluid Interfaces Group at the MIT Media Lab. A grad student with the Fluid Interfaces Group at MIT, he caused a storm with his creation of Sixth Sense. He says that the movies "Robocop" and "Minority Report" gave him the inspiration to create his view of a world not dominated by computers, digital information and human robots

but one where computers and other digital devices enhance people's enjoyment of the physical world.

Sixth Sense' technology takes a different approach to computing and tries to make the digital aspect of our lives more intuitive, interactive and, above all, more natural. We shouldn't have to think about it separately. It's a lot of complex technology squeezed into a simple portable device. When we bring in connectivity, we can get instant, relevant visual information projected on any object we pick up or interact with.

Under Water Communication Networks

Ashutosh Mishra
3rd yr Student

UNDERWATER WIRELESS COMMUNICATION NETWORKS (UWCNS) INCLUDE SENSORS AND AUTONOMOUS UNDERWATER VEHICLES (AUVS) THAT INTERACT TO PERFORM SPECIFIC APPLICATIONS SUCH AS UNDERWATER MONITORING. COORDINATION AND INFORMATION SHARING BETWEEN SENSORS AND AUVS MAKE THE ROVISION OF SECURITY CHALLENGING.THE UNIQUE CHARACTERISTICS OF THE UNDERWATER ACOUSTIC CHANNEL AND THE DIFFERENCES BETWEEN SUCH NETWORKS AND THEIR GROUND BASED COUNTERPARTS REQUIRE THE DEVELOPMENT OF EFFICIENT AND RELIABLE SECURITY MECHANISMS

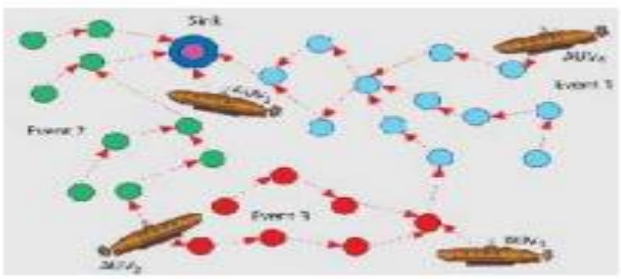
The aquatic environment is particularly vulnerable to malicious attacks due to the high bit error rates, large and variable propagation delay, low bandwidth of acoustic channels in water. Achieving reliable inter vehicle and sensor-AUV communication is especially difficult due to the mobility of AUVs and the movement of sensors with water currents.

The above mentioned characteristics of UWCNs have several security issues associated like packet errors, eavesdropping, modification of packets, and many more. Also since power consumption in underwater communications is higher than in terrestrial radio communications energy exhaustion attacks can reduce network life.

The different attacks possible are Jamming, Wormholes, Selective Forwarding, Sybil Attacks, etc.

Defences for these are discussed. Jamming can be overcome by Spread Spectrum techniques, Wormhole detection is done with a visual modelling using Dis-VoW and other attacks can be countered by authentication, verification, and positioning. Open research challenges for secure localization, routing and time synchronization are mentioned.

In this paper UWCNs is discussed, with emphasis on the possible attacks, countermeasures and further opportunities and scope for development in this direction to improve security of such networks. Overview of Underwater Wireless Communication Networks Underwater wireless communication networks (UWCNs) consist of sensors and autonomous underwater vehicles (AUVs) that interact, coordinate and share information with each other to carry out sensing and monitoring functions. A pictorial representation is shown below:



In last several years, underwater communication network (UWCN) has found an increasing use in a widespread range of applications, such as coastal surveillance systems, environmental research, autonomous underwater vehicle (AUV) operation, oil-rig maintenance, collection of data for water monitoring, linking submarines to land, to name a few By deploying a distributed and scalable sensor network in a 3-dimensional underwater space, each underwater sensor can monitor and detect environmental parameters and events locally. Hence, compared with remote sensing, UWCNs provide a better sensing and surveillance technology to acquire better data to understand the spatial and temporal complexities of underwater environments. Present underwater communication systems involve the transmission of information in the form of sound, electromagnetic (EM), or optical waves. Each of these techniques has advantages and limitations.

Based on applications there are three types of UWSNs (sensor networks):

1. Mobile UWSNs for long-term non-time critical applications (M-LT-UWSNs);
2. Static UWSNs for long-term non-time critical applications (S-LT-UWSNs);
3. Mobile UWSNs for short-term time-critical applications (M-ST-UWSNs).

Besides the UWSNs mentioned above, underwater networks also include sparse mobile AUV (autonomous underwater vehicle) or UUV (unmanned underwater vehicle) networks, where vehicles/nodes can be spaced out by several kilometers. These types of networks have their unique communication requirements.

Among the three types of waves, acoustic waves are used as the primary carrier for underwater wireless communication systems due to the relatively low absorption in underwater environments.

The security requirements to be met in UWCNs are:

- Authentication: Authentication is the proof that the data received was sent by a legitimate sender. This is essential in military and safety-critical applications of UWCNs.
- Confidentiality: Confidentiality means that information is not accessible to unauthorized third parties. It needs to be guaranteed in critical applications such as maritime surveillance.
- Integrity: It ensures that information has not been altered by any adversary. Many underwater sensor applications for environmental preservation, such as water quality monitoring, rely on the integrity of information.

Availability: The data should be available when needed by an authorized user. Lack of availability due to denial-of-service attacks would especially affect time-critical aquatic exploration applications such as prediction of seaquakes.

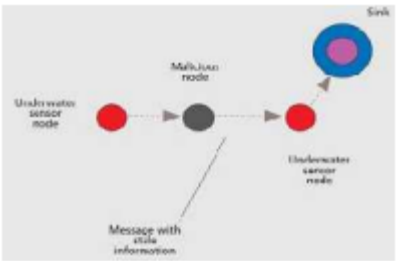
Some common terminology used here is defined:

- Attack: Attempt to gain unauthorized access to a service, resource, or information, NOV-2018 VOLUME-12 www.eee.gift.edu.in or the attempt to compromise integrity, availability, or confidentiality.

- Attacker, Intruder, Adversary : The originator of an attack.
- Vulnerability : Weakness in system security design, implementation, or limitations that could be exploited.

- Threat : Any circumstance or event (such as the existence of an attacker and vulnerabilities) with the potential to adversely impact a system through a security breach.

Defence : An idea or system or model that counters an attack Jamming and Spread Spectrum Technique to Counter Jamming Jamming is deliberate interference with radio reception to deny the target's use of a communication channel. For single-frequency networks, it is simple and effective, rendering the jammed node unable to communicate or coordinate with others in the network.



A jamming attack consists of interfering with the physical channel by putting up carriers on the frequencies used by nodes to communicate.
Since it requires a lot of energy, attackers usually attack in sporadic bursts. Since underwater acoustic frequency bands are narrow (from a few to hundreds of kilohertz), UWCNs are vulnerable to narrowband jamming. Localization is affected by the replay attack when the attacker jams the communication between a sender and a receiver, and later replays the same message with stale information (an incorrect reference) posing as the sender.
In frequency hopping, a device transmits a signal on a frequency for a short period of time, changes to a different frequency and repeats. The transmitter and receiver must be coordinated. Direct-sequence spreads the signal over a wide band, using a pseudo- random bit stream. A receiver must know the spreading code to distinguish the signal from noise.
Frequency-hopping schemes are somewhat resistant to interference from an attacker who does not know the hopping sequence. However, the attacker may be able to jam a wide band of the spectrum, or even follow the hopping sequence by scanning for the next transmission and quickly tuning the transmitter.

Telemedicine Healing Touch through Space

Nirod Sundar Panda
2nd year

With an area of about 3.2 million square kilometers, India is the seventh largest country in the world. This vast South Asian country gifted with ancient historic background is endowed with varied landscapes like mountain regions, deserts, green plains, and the far-flung and hilly areas in the Jammu & Kashmir, Uttaranchal, North Eastern Region and the offshore islands of Andaman and Lakshadweep. To provide the basic minimum healthcare for India's population which is predominantly rural and distributed across distant geographical locations has been one of the priorities of Health Administration all along. In today's world, despite several advances made in the Medical field, the benefits are still available to the privileged few residing mainly in the urban areas. With the advent of Communication Technology, especially the Satellite Communications (SatCom) combined with Information Technology; we have means to extend the benefits from the advanced medical sciences even to the remote and inaccessible areas

The Beginning:-

Telemedicine facilitates the provision of medical aid from a distance. It is an effective solution for providing specialty healthcare in the form of improved access and reduced cost to the rural patients and the reduced professional isolation of the rural doctors. Telemedicine can enable ordinary doctors to perform extra-ordinary tasks.
Through its Telemedicine projects, ISRO has successfully linked hospitals and healthcare centers in remote rural areas with specialty hospitals in cities through INSAT satellites.

Technology of Telemedicine -

Telemedicine is a confluence of Communication Technology, Information Technology, Biomedical Engineering and Medical Science. The Telemedicine system consists of customised hardware and software at both the Patient and Specialist doctor ends with some of the Diagnostic Equipment's like ECG, X-ray and pathology Microscope/Camera provided at the patient end. They are connected through a Very Small Aperture Terminal (VSAT) system and controlled by the Network Hub Station of ISRO. Through a Telemedicine system consisting of simple computer with communication Systems, the medical images and other information pertaining to the patients can be sent to the specialist doctors, either in advance or on a real time basis through the satellite link in the form of Digital Data Packets. These packets are received at the specialist centre, the imagesAnd other information is reconstructed so that the specialist doctor can study the data, perform diagnosis, interact with the patient and suggest the appropriate treatment during a Video Conference with the patient end. Telemedicine facility thus enables the specialist doctor and the patient Separated by thousands of kilometres to see visually and talk to each other. This enables the specialist doctor to assess the physical and psychological state of the patient and suggest treatment. This remote tele-consultation and treatment is much more valuable in case of post operation (Post Surgery) follow up since the patient is not required to travel unnecessarily

and hence Saving money and time. In this way, the systematic application of Information and Communication Technologies to the practice of healthcare rapidly expands the outreach of the healthcare system.

Telemedicine Technology – Evolution

- Point to Point System - One patient end connect to One Specialist Doctor within the hospital NOV-2018 VOLUME-12 www.eee.gift.edu.in
- Point to Multi Point System - One patient end at a time connect to any of the specialist Doctors' End within the hospital
- Multi Point to Multi Point System - Several patients' end simultaneously connect to different Doctors'

End at different hospitals at different geographical locations

geographical locations

Major areas of Telemedicine Technology Adopted…

- Tele-consultation
- Tele-diagnosis
- Tele-treatment
- Tele-education
- Tele-training
- Tele-monitoring

ISRO's Telemedicine Program – Thrust Areas

Providing Technology and Connectivity *

- Remote/Rural Hospitals and Specialty Hospitals
- Continuing Medical Education (CME)
- Mobile Telemedicine Units
- Disaster Management Support (DMS)

The Future ISRO's Telemedicine endeavor is expanding its outreach and has the potential to open up new frontiers for facilitating rural healthcare in India. Encouraged by the steady growth of its Telemedicine Program, ISRO has also envisioned the development of "HEALTHSAT", an exclusive satellite for Meeting the healthcare and medical education needs of the country at large. This satellite, when deployed along with wireless and terrestrial communication links, can bring a large change in augmenting the present health care delivery system in the country. Due to the untiring efforts of various departments like the Department of Space and the Department of Information Technology, State Governments, NGOs and Private and Corporate Hospitals/Agencies, the majority Of the rural population all over the country will stand to benefit from Telemedicine Technology that can usher in are evolution for transforming the face of Healthcare in India. Thus, Telemedicine can enlarge the gap between life and death and can extend quality Healthcare to the needy and the under privileged rural, semi-rural and urban population at large.

HAPTIC Technology

Sweta Snigdha Panda
2nd yr

Haptic technology is an interface between the consumer & a virtual environment using touch sensing through applying vibrations, forces & motions to the consumer. This is a mechanical simulation, used to help while creating virtual objects to enhance the remote control of devices and machines.

This technology helps investigate how the touch sense of human works using cautiously controlled HAPTIC virtual objects which are used to systematically investigate the capabilities of human haptic.

Even though haptic devices are used to calculate the forces that are applied by the user like bulk otherwise reactive, it should not be confused through the sensors like tactile/touch to calculate the force used by the consumer to the interface

Floating Power Plant

Kisan Mahapatro
2nd yr

The floating power plant was invented in the North of Brazil after many years of work on the rivers to study the behavior of the river for the force and velocity of the water in the flood time. So a system is developed like floating of power plant for generating electrical energy without affecting the environment in any way otherwise the area where the system is installed.

This system is installed in a small river, after that this system is installed in the oceans and seas for Floating Power Plant to control the plentiful energy in the plants through waves & tides.

Hybrid Electric Vehicle

Nupur Patra
2nd yr

At present, a hybrid electric vehicle is the best solution for different problems. This electric vehicle is a spacious & lighter vehicle since there is a low requirement to carry several heavy batteries. The inside ignition engine within hybrid-electric is very smaller, lighter as well as efficient more as compared with the engine within a conventional automobile.

Automobile manufacturers have already announced tactics to construct their hybrid type vehicles. As compared with standard automobiles, these electric vehicles give 20 – 30 more miles for each gallon and give less pollution.

BIO BATTERY

Rudra Narayana Sahoo
2nd yr

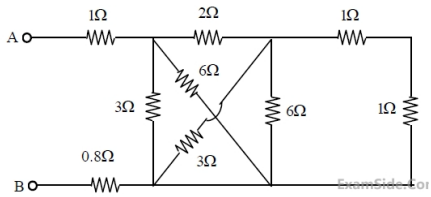
powered by organic compounds. Bio-Battery generates electricity from renewable fuels (glucose, sucrose, fructose, etc) providing a sustained, on-demand portable power source. When enzymes in our bodies break down glucose, several electrons and protons are released. Therefore, by using enzymes to break down glucose, bio-batteries directly receive energy from glucose. These batteries then store this energy for later use. This concept is almost identical to how both plants and many animals obtain energy**.** Bio battery use biocatalyst, either biomolecules such as enzymes or even whole living organism to catalyze oxidation of bio mass-based materials for generating electrical energy.

Bio Battery can be called as energy accumulated device that is motorized by organic compounds, usually being glucose, like glucose in human blood. Many electrons and protons are released due to break down of glucose by enzymes present in our body. Thus, bio batteries directly get energy from glucose by using enzymes present in a human body break down glucose. An interesting fact is that bacteria can generate electricity when a protein in their cell membranes gets in touch with a mineral surface. Shewanella oneidensis is marine bacteria that can develop electric currents when bared to heavymetals like iron and manganese. These proteins can transmit electrons transversely a membrane at a rate faster enough so that the energy produced is sufficient so that bacteria can survive. Functioning of these bacteria will help scientists in making those bio batteries that could store energy for sensors in remote environment.

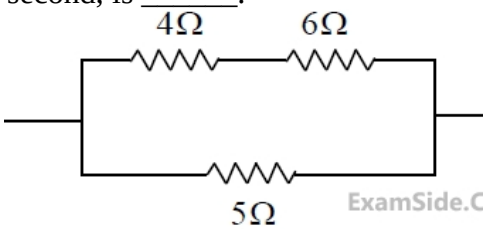
Human blood and sugar glucose are considered as most priceless sources of power because they happen naturally, are easy to get and no harmful emissions are reproduced. Another interesting battery uses human urine as its fuel.

1. The power supplied by the 25 V source in the figure shown below is _____W

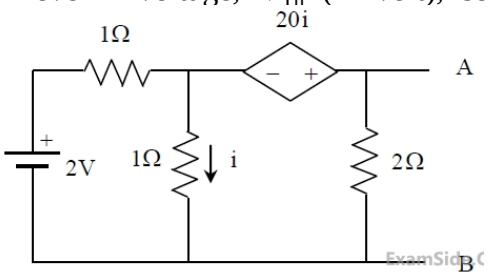
2. The equivalent resistance between the terminals A and B is _____ Ω.



3. In the portion of a circuit shown, if the heat generated in 5 Ω resistance is 10 calories per second then heat generated by the 4 Ω resistance, the calories per second, is _____.



4. For the given circuit the Thevenin equivalent is to be determined. The Thevenin voltage, V_{Th} (in volt), seen



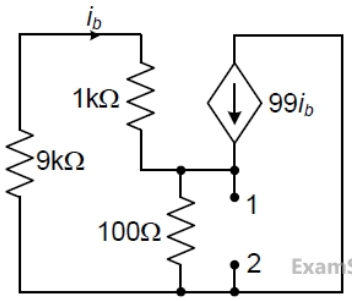
5. A non-ideal voltage source V_S has an internal impedance of Z_S. If a purely resistive load is to be chosen that maximizes the power transferred to the load, its value must be

a) 0
b) Real part of Zs
c) Magnitude of Zs
d) Complex conjugate of Zs

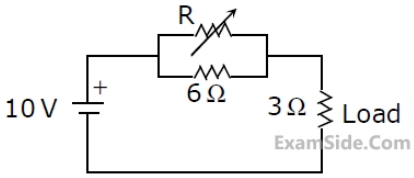
6. A source vs(t)=Vcos100πtvs(t)=Vcos100πt has an internal impedance of (4 + j3) Ω.If a purely resistive load connected to this source has to extract the maximum power out of the source, its value in Ω should be

a) 3
b) 4
c) 5
d) 7

7. The impedance looking into nodes 1 and 2 in the given circuit is



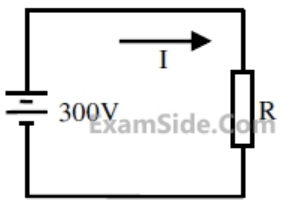
8. In the circuit given below, the value of R required for the transfer of maximum power to the load having a resistance of 3 Ω is



9. Superposition principle is not applicable to a network containing time-varying registors

a) TRUE
b) FALSE

10. In the figure, the value of resistor R is (25+I2)Ω(25+I2)Ω, where I is the current in amperes. The current I is _____.



11. A passive 2-port network is in a steady state. Compare to its input, the steady state output can never offer.

a) Higher Voltage
b) Lower Impedance
c) greater power
d) better regulation

12. The impulse response of an LTI system can be obtained by

Differentiating the unit ramp

a) Differentiating the step ramp
b) Integrating the unit ramp
c) Integrating the step ramp

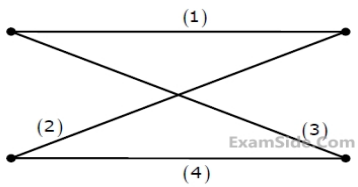
13. Negative feedback in a closed-loop control system DOES NOT

a) Reduce the overallgain
b) Reduce bandwidth
c) Improve disturbance rejection
d) Reduce sensitivity to parameter variation

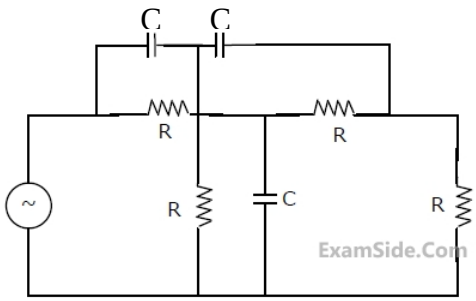
14. Tachometer feedback in a d.c. position control system enhances stability.

a) True
b) False

15. In the following graph, the number of trees (P) and the number of cut-sets (Q) are



16. The minimum number of equations required to analyze the circuit shown in Fig.



a) 3
b) 4
c) 6
d) 7

17. A network has 7 nodes and 5 independent loops. The number of branches in the network is

a) 13
b) 12
c) 11
d) 10

18. The number of independent loops for a network with n nodes and b branches is

a) n-1
b) B-n
c) B-n+1
d) Independent of the number of nodes

19. A single-phase 100 kVA, 1000 V / 100 V, 50 Hz transformer has a voltage drop of 5% across its series impedance at full load. Of this, 3% is due to resistance. The percentage regulation of the transformer at full load with 0.8 lagging power factor is

a) 4.8
b) 6.8
c) 8.8
d) 10.8

20. A 3-phase 900 kVA, 3 kV / √33 kV (Δ/Y), 50 Hz transformer has primary (high voltage side) resistance per phase of 0.3 Ω and secondary (low voltage side) resistance per phase of 0.02 Ω. Iron loss of the transformer is 10 kW. The full load % efficiency of the transformer operated at unity power factor is _____ (up to 2 decimal places).

ANSWER SIDE

1.	250
2.	3
3.	1.9 & 2.1
4.	3.36
5.	Magnitude of Zs
6.	5
7.	50ohm
8.	Zero
9.	False
10.	10
11.	Greater power
12.	Differentiating the unit ramp
13.	Reduce band width
14.	False
15.	P=4, Q=6
16.	3
17.	11
18.	B-n+1
19.	4.8
20.	97.20 & 97.55

30th November, **Current Affairs**:

- The Indian economy grew at 7.1 per cent during the July-September quarter (quarter 2) for the financial year 2018-19.

29th November, **Current Affairs:**

- ISRO's PSLV-C43 successfully places HysIS and 30 other foreign satellites in respective orbits. The HysIS is an Earth observation satellite primarily to assist in a wide range of applications in agriculture, forestry, geological environments, coastal zones, among others. The 30 satellites are one each from Australia, Canada, Colombia, Finland, Malaysia, Netherlands and Spain, and 23 from the USA.
- President Ram Nath Kovind has appointed Arvind Saxena as the new Chairman of the Union Public Service Commission.
- G20 Summit 2018 begins in Argentina.

28th November, Current Affairs:

- Around 73 per cent votes were cast in the Mizoram assembly polls held for all the 40 assembly seats. 74.61 per cent voters exercised their franchise in the Madhya Pradesh assembly elections for 230 assembly seats.
- Cristiano Ronaldo became the first player to achieve 100 Champions League wins with 1-0 victory over Valencia

26th November, Current Affairs:

- After seven months of traveling through space, the NASA InSight mission has landed on Mars.
- President RN Kovind appointed election commissioner Sunil Arora as the next Chief Election Commissioner. He is slated to take over as CEC on December 2, a day after incumbent Om Prakash Rawat retires.
- Men's Hockey World Cup 2018 started from today with opening ceremony in Bhubaneswar.
- **25th November, Current Affairs**: SPONSORED SEARCHES current affairs special daily current gk gk question and current affairs gk quiz
- India beat Australia by six wickets in the third and the final T20I match at the Sydney Cricket Ground (SCG) to draw series 1-1.
- Australia Women Cricket Team wins their fourth women's World Twenty20 title after a eight-wicket victory over England in the final at the Sir Vivian Richards Stadium in Antigua and Barbuda.

24th November, Current Affairs:

- M C Mary Kom defeated Ukraine's Hanna Okhota in the final of the Women's World Boxing Championships to clinch the gold medal in the 48kg category and her sixth world title at the K.D. Jadhav Indoor Stadium.

21st November, Current Affairs: • WhatsApp named Abhijit Bose as its India Head, the co-founder and chief executive of Indian mobile payments firm Ezetap.

20th November, Current Affairs:

Nearly 72 per cent voting was recorded till 6 pm as polling came to a close in the second and final phase of Chhattisgarh assembly elections. A total of 1,079 candidates are contesting in the 72 constituencies of 19 districts in the State with an electorate of 1,54,00,596.

18th November, Current Affairs:

The first trial run of indigenously developed Indian's engineless train, the "Train 18" was successfully conducted on tracks at Moradabad-Rampur section of Northern Indian Railways.

16th November, Current Affairs:

Thirteen people were killed as cyclone Gaja made landfall in Tamil Nadu

14th November, Current Affairs:

- Children Day is celebrated today.
- Prime Minister Narendra Modi arrived in Singapore for a two-day visit during which he will attend the East Asia Summit.
- Asian Games gold medallist Hima Das appointed as the UNICEF Youth Ambassador.

13th November, Current Affairs:

- Marvel legend Stan Lee, who is the co-creator of iconic superheroes like Spider-Man and The Hulk died at the age of 95 years in Los Angeles.
- Union minister Narendra Singh Tomar has been given the additional charge of the ministry of parliamentary affairs and D V Sadananda Gowda that of the ministry of chemicals and fertilisers.

12th November, Current Affairs:

- In the phase one of Chhattisgarh elections, 70 per cent voter turnout for the 18 constituencies.
- Prime Minister Narendra Modi inaugurate two major national highways and an inland waterways project in Varanasi today.
- Union Minister and senior BJP leader Ananth Kumar died in Bengaluru at the age of was 59. Ananth Kumar was suffering from lung cancer.

11th November, Current Affairs:

- World leaders attend a ceremony at the Arc de Triomphe in Paris today as part of commemorations marking the 100th anniversary of the November 11, 1918 armistice, ending World War

10th November, Current Affairs: Harmanpreet Kaur smashed a 51-ball 103 in the opening match held in the West Indies to become the first Indian woman to score a Twenty20 International (T20I) century.

- India's star Wrestler Bajrang Punia became the number one rank in the world in the 65kg category, with 96 points in the latest UWW list.

9th November, Current Affairs:

- China’s state news agency Xinhua introduced World's first AI anchors who can report all day every day, from anywhere in the country. Teh agency had created a digital version of a regular Xinhua news anchor named Qiu Hao.
- The 2018 ICC Women's World Twenty20 tournament started from today in West Indies.

7th November, Current Affairs:

- The festival of lights, Diwali is celebrated today in India.

6th November, Current Affairs:

- The ruling Congress-Janata Dal Secular (JDS) alliance in Karnataka has won two assembly seats and two Lok Sabha seats in bypolls. The BJP has won only one parliamentary seat, Shivamogga, vacated by former chief minister BS Yeddyurappa.
- Uttar Pradesh Chief Minister Yogi Adityanath announced that Faizabad district will henceforth be known as Ayodhya.
- India opener Rohit Sharma has surpassed Virat Kohli to become the highest run-scorer in T20 international cricket for India.

5th November, Current Affairs:

- Third Ayurveda Day is celebrated today in India.
- INS Arihant, India's first nuclear ballistic missile submarine, has completed its first "deterrence patrol". With Arihant successfully completing its patrol, India now has a dependable nuclear triad. A nuclear triad means that the country now has the capability of firing nuclear weapons from land, air and sea.
- Researchers at Indian Institute of Technology Madras (IIT-M) have designed and booted up India's first microprocessor, Shakti, which could be used in mobile computing and other devices.

3rd November, Current Affairs:

- Delhi Chief Minister Arvind Kejriwal inaugurated Signature Bridge over the Yamuna River. It is the first asymmetrical cable stayed bridge in India.

2nd November, Current Affairs:

- Indian passport ranks 66th in the Global Passport Power Rank 2018.
- The Ministry of Defence has decided to induct women as sailors in the Indian Navy.

1st November, Current Affairs:

- India defeated Windies by nine wickets in the fifth and final match of the One-day international (ODI) series in Thiruvananthapuram to clinch the five-match ODI series 3-1. By virtue of this win, Kohli became the first Indian captain to win six consecutive ODI series at home.
- Former India captain Rahul Dravid becomes the fifth Indian to be inducted into ICC Hall Of Fame.

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