RSM POLY NEWSLETTER – AUG 2020

ABOUT MVP SAMAJ

The **Maratha Vidya Prasarak Samaj** is one of the most prestigious centers of learning in the State of Maharashtra. It manages 485 educational units and is one of the premier educational hub in the Nashik district.

At present, more than 2 lakhs of students are pursuing education. Over past 105 years, the institute has stood the test of time to become legend of unparalleled stature. History says that the credit for the birth of M.V.P. Samaj goes to the young, enthusiastic & devoted team of social workers and educationists who were inspired by the lives of Mahatma Jyotiba Phule, Savitribai Phule and Rajarshi Shahu Maharaj of Kolhapur. These young leading lights include Karmaveer Raosaheb Thorat, Bhausaheb Hire, Kakasaheb Wagh, Annasaheb Murkute, Ganpat Dada More, D. R. Bhonsale, Kirtiwanrao Nimbalkar and Vithoba Patil Khandalaskar, who laid the foundation of the Samaj. They were the men who envisioned the culture and knowledge centric society. The great visionaries of MVP Samaj rightly laid the "Wellbeing and happiness of masses" as the motto for the samaj.

ABOUT RSM POLYTECHNIC

The **Rajarshi Shahu Maharaj Polytechnic** has been established in the year 2008, at the central place in Nashik. It is affiliated to MSBTE, Mumbai and approved by Government of Maharashtra, DTE Mumbai and the AICTE, New Delhi. The Polytechnic is in the process of Accreditation and Gradation. The Polytechnic has well-equipped and well-furnished laboratories, workshop and hostel facilities. Every department has separate computational facilities along with LAN, Wi-Fi and necessary software. At present the RSM Polytechnic provides three-year courses leading to Diploma in Engineering of MSBTE, Mumbai in the five disciplines: Mechanical Engineering, Computer Technology, Electronics and Telecommunication Engineering, Information Technology and Electrical Engineering.

VISION AND MISSION

VISION:

- To Empower the Common Masses by providing Quality Technical Education.

MISSION:

- To create and implement innovative best practices to achieve academic excellence.
- To enhance the overall development of students by imparting essential skills.
- To inculcate principles of professional activities by promoting industry institute interaction and entrepreneurial skills.
- To create an environment awareness for sustainable development.

Admissions Open for First Year and Direct Second Year Diploma Engineering

मराठा विद्या प्रसारक समाजाचे
राजर्षी शाहू महाराज पॉलिटेक्निक, नाशिक
उदोजी मराठा बोर्डींग कॅम्पस, गंगापूर रोड, नाशिक-१३
फोन नं.०२५३-२३११०१८, २३११०१९

प्रथम वर्ष व थेट द्वितीय वर्ष प्रवेश

शाखा	कोड	क्षमता
मेकॅनिकल इंजिनिअरींग	524761210	60
कॉम्प्युटर टेक्नोलॉजी	524725110	60
इलेक्ट्रॉनिक्स ऑन्ड टेलीकम्युनिकेशन इंजिनिअरींग	524737210	60
इन्फॉरमेशन टेक्नोलॉजी	524724610	60
इलेक्ट्रीकल इंजिनिअरींग	524729310	60

प्रवेशासाठी पात्रता

प्रथम वर्ष	थेट द्वितिय वर्ष
❈ इयत्ता १० वी पास	❈ इ. १२ वी सायन्स, एम.सी.व्ही.सी., व्होकेशनल, टेक्निकल ❈ आय.टी.आय. (कमीत कमी दोन वर्षांचा कालावधी)

वैशिष्ट्ये : ❈ उच्च शिक्षित व अनुभवी प्राध्यापक वर्ग ❈ सर्व प्रकारच्या शासकिय स्कॉलरशिप योजना लागू ❈ नाशिक शहराच्या मध्यवर्ती ठिकाणी ❈ सुसज्ज प्रयोगशाळा व सुसज्ज ग्रंथालय ❈ कॅम्पस इंटरव्ह्युद्वारा नोकरी मिळविण्याची संधी.

MVP RSM Polytechnic Facilitation Center

▪ **DTE, Mumbai Approved Facilitation Center for First Year and Direct Second Year Diploma Engineering Admissions 2020-21**

थर्मल स्क्रिनिंग करतांना

सॅनिटायझर वाटप करतांना

सुविधा केंद्र

FC follows guidelines as per SOP of DTE and takes all precautions to avoid spread of Covid-19 with social distancing.

MVP RSM Polytechnic

- **MVPS's RSM Polytechnic celebrated Independence Day (15ᵗʰ August 2020)**

MVPS's RSM Polytechnic was celebrated Independence Day. Er. Damodar Gawale, and Mr. Krishnamurti More (LMC Member) were chief guest for program and hosted flag on this ocassion.

MVPS's RSM Polytechnic was celebrated Samajdin on Birth Aniversary of Karmveer Raosaheb Thorat. Mr. Krishnamurti More (LMC Member) has hosted flag on this ocassion.

- **MVPS's RSM Polytechnic celebrated Samajdin (19ᵗʰ August 2020)**

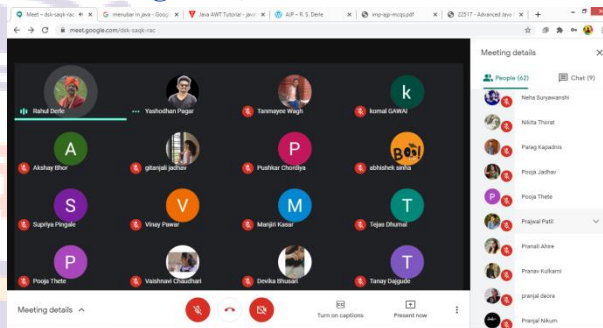- **MVPS's RSM Polytechnic celebrated Ganesh Ustosav (22ⁿᵈ August 2020)**

Hon. Education Officer Dr. D. D. Kajale performed Ganesh Rituals (Aarti).

Computer Engg. Department

- **Online Lectures started by Computer Technology Dept. through Online Mode. (31st Aug 2020)**
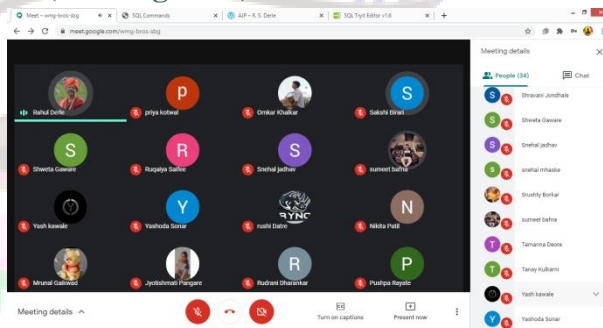

Prof. P. D. Boraste and faculty have started online lectures for SYCM and TYCM students for this Academic Year through online mode due to Covid 19 pandemic and lockdown situation and almost completed 24% syllabus.

Information Techology Department

- **Online Lectures started by Information Technology Dept. through Online Mode. (31st Aug 2020)**

Prof. V. K. Khedkar and faculty have started online lectures for SYIF and TYIF students for next Academic Year through online mode due to Covid 19 pandemic and lockdown situation and almost completed 25% syllabus.

Principal Dr. D. B. Uphade prayed to Ganpati Bappa for speedy recovery from Corona Pandemic.

Mechanical Engg. Department

- **Online Lectures started by Mechanical Engineering Dept. through Online Mode. (31st Aug 2020)**

Prof. B. S. Deshmukh and faculty have started online lectures for SYME and TYME students for this Academic Year through online mode due to Covid 19 pandemic and lockdown situation and almost completed 25% syllabus.

Electrical Engineering Department

- **Online Lectures started by Electrical Engg. Dept. through Online Mode. (31st Aug 2020)**

Prof. P. R. Gangurde and faculty have started online lectures for SYEE and TYEE students for this Academic Year through online mode due to Covid 19 pandemic and lockdown situation and almost completed 24% syllabus.

- **Online Carrier Guidance by Electrical Engg. Dept. (23rd Aug 2020)**

10th Passout students through online mode under guidance of Principal Dr. D. B. Uphade.

E & TC Engineering Department

- **Online Lectures started by E & TC Engg. Dept. through Online Mode. (31st Aug 2020)**

Prof. S. N. Shelke and faculty have started online lectures for SYEJ and TYEJ students for this Academic Year through online mode due to Covid 19 pandemic and lockdown situation and almost completed 25% syllabus.

- **Online Carrier Guidance by E & TC Engg. Dept. (21st and 29th Aug 2020)**

Prof. P. R. Gangude and faculty had conducted online Carrier Guidance for Electical Engg. for

RSM in News:

मराठा विद्या प्रसारक समाजाचे
राजर्षी शाहू महाराज पॉलिटेक्निक नाशिक
RSM POLY उदोजी मराठा बोर्डिंग कॅम्पस, केबीटी कॉलेज व वाघ गुरूजी शाळेजवळ, गंगापूर रोड, नाशिक

इलेक्ट्रॉनिक्स ॲण्ड टेलेकम्युनिकेशन इंजिनिअरिंग
करिअरबाबत मार्गदर्शन शिबीर

१० वी तसेच १२ वी नंतर
प्रथम वर्ष व थेट व्दितीय वर्ष
डिप्लोमा इंजिनिअरींगला प्रवेशासाठी

मविप्र पॉलिटेक्निक
यांचेमार्फत करिअरबाबत व ऑनलाइन फॉर्म भरण्यासाठी
मार्गदर्शन शिबीर

शनिवार दि २९ ऑगस्ट २०२० रोजी सकाळी १०:३० वा
ऑनलाइन पध्दतीने आयोजित केले आहे,
अर्ज भरण्यासाठी व संबधीत सर्व प्रकिया पुर्ण करण्यासाठी
विदयार्थी व पालकांनी शिबीराचा लाभ घ्यावा.

Google Meet Link
meet.google.com/wof-zcqs-vim

अधिक माहितीसाठी
📞 99702 73067   📞 9881 981 004

उदोजी मराठा बोर्डिंग कॅम्पस, केबीटी कॉलेज व वाघ गुरूजी शाळेजवळ, गंगापूर रोड, नाशिक
Tel: 0253 231 1018   www.rsmpoly.mvp.edu.in   ndmvprsmpoly@gmail.com

शाडूमूर्तींचे ऑनलाइन प्रशिक्षण

नाशिक : गणेशोत्सव पर्यावरणपूरक साजरा करण्यासाठी सेवाभावी बहुजन-हिताय संस्थेतर्फे सीएमसीएस आणि राजश्री शाहू महाराज पॉलिटेक्निक महाविद्यालयाच्या सहयोगाने मोफत शाडूपासून गणेशमूर्ती बनवण्याचे ऑनलाइन शिबिर आयोजित केले होते. शाडूपासून चिखलाचा गोळा आणि त्यातून आकाराला येणारी आकर्षक मूर्ती पाहून विद्यार्थी व पालकही हरखून गेले. आपण स्वतः तयार केलेली गणेशमूर्ती मनाला आनंद देत होती. तर पालकांनाही त्याचे कौतुक वाटत होते. शिबिराचे वैशिष्ट्य म्हणजे सहभाग घेतलेले विद्यार्थी त्यांच्या घरी या मूर्तीची स्थापना करणार असून,त्याद्वारे पर्यावरण रक्षणाचा संदेश देणार आहेत. यावेळी प्रमुख पाहुणे ॲड. रवींद्र पगार यांनी मार्गदर्शन केले. तसेच आयोजक प्राचार्य एस. एन. शिंदे आणि डॉ. उफाडे यांनी कार्यक्रमाचा उद्देश स्पष्ट केला. कविता सोनवणे यांनी शाडूपासून गणेशमूर्ती बनवण्याचे प्रात्यक्षिक व मार्गदर्शन केले. त्यावेळी संस्थेचे अध्यक्ष राहुल भामरे यांच्यासमवेत राहुल दरेकर, अमित मोरे, सुयोग कस्तुरे, सौरभ डोंगरे, सुनिल देवरे, विशाल कोठावदे, निखिल बऱ्हाटे आदी उपस्थित होते.

Daily Newspaper Pudhari, Page No.: 9, Dt: 21st Aug 2020

Prof. S. N. Shelke and faculty had conducted online Carrier Guidance for E & TC Engg. for 10th Passout student through online mode under guidance of Principal Dr. D. B. Uphade.

Trending Technology:

Edge Computing

Edge computing is a distributed computing paradigm that brings computation and data storage closer to the location where it is needed, to improve response times and save bandwidth.

Definition:

One definition of edge computing is any type of computer program that delivers low latency nearer to the requests. edge computing broadly as all computing outside the cloud happening at the edge of the network, and more specifically in applications where real-time processing of data is required. In his definition, cloud computing operates on big data while edge computing operates on "instant data" that is real-time data generated by sensors or users.

Edge nodes used for game streaming are known as gamelets, which are usually one or two hops away from the client.

Privacy and security: The distributed nature of this paradigm introduces a shift in security schemes used in cloud computing. Not only should data be encrypted, but different encryption mechanism should be adopted, since data may transit between different distributed nodes connected through the internet before eventually reaching the cloud. Edge nodes may also be resource constrained devices, limiting the choice in terms of security methods. Moreover, a shift from centralized top-down infrastructure to a decentralized trust model is required. On the other hand, by keeping data at the edge it is possible to shift ownership of collected data from service providers to end-users.

Reliability: Management of failovers is crucial in order to maintain a service alive. If a single node goes down and is unreachable, users should still be able to access a service without interruptions. Moreover, edge computing systems must provide actions to recover from a failure and alerting the user about the incident. To this aim, each device must maintain the network topology of the entire distributed system, so that detection of errors and recovery become easily applicable. Other factors that may influence this aspect are the connection technology in use, which may provide different levels of reliability, and the accuracy of the data produced at the edge that could be unreliable due to particular environment conditions.

Efficiency: Due to the proximity of the analytical resources to the end users, sophisticated analytical tools and Artificial Intelligence tools can run on the edge of the system. This placement at the edge helps to increase operational efficiency and contributes many advantages to the system.

Applications: Edge application services reduce the volumes of data that must be moved, the consequent traffic, and the distance that data must travel. That provides lower latency and reduces transmission costs.

Mrs. Jagruti Patil
TA, Computer Technology

Cryptocurrency

A Cryptocurrency is a virtual or digital foreign money designed to paintings as a medium of exchange. It makes use of cryptography to steady and confirm transactions in addition to to govern the introduction of recent devices of a specific cryptocurrency. Essentially, cryptocurrencies are confined entries in a database that nobody can alternate until unique situations are fulfilled.

Bitcoin is a Cryptocurrency, a shape of digital cash. It is a decentralized virtual forex without is unbiased of banks and may be despatched from consumer to consumer at the peer-to-peer bitcoin block-chain community without the want for intermediaries.

Bitcoin is a shape of digital cash. Where maximum virtual kinds of cash depend on a imperative celebration to make it work, like a financial institution or a fee processor, Bitcoin is maintained through a community of users. As an open community, all people can emerge as a consumer through honestly downloading a bit of open-supply software program on their pc and connecting to the Bitcoin community via the internet.

Users at the community can ship every different transaction. Once one of these transactions is made, all computer systems at the community take a look at the transaction to ensure the transaction is valid — for example, verifying that the cash withinside the transaction honestly exist and honestly belonged to the character sending the transaction. Because absolutely each person tests everything, nobody may be cheated.

Most common cryptocurrencies:

Bitcoin: The first ever cryptocurrency that started it.

Ethereum: A Turing-complete programmable currency that lets developers build different distributed apps and technologies that wouldn't work with Bitcoin.

Ripple: Unlike most cryptocurrencies, it doesn't use a Blockchain in order to reach a network-wide consensus for transactions. Instead, an iterative consensus process is implemented, which makes it faster than Bitcoin but also makes it vulnerable to hacker attacks.

Bitcoin Cash: A fork of Bitcoin that is supported by the biggest Bitcoin mining company and a manufacturer of ASICs Bitcoin mining chips. It has only existed for a couple of months but has already soared to the top five cryptocurrencies in terms of market cap.

Mast. Dipkumar Hire
TYCM

Prepaid energy in time of Smart Metering

Practically, there are three ways to pay for a service. Before performing the service, after its execution and a combination of the two previous options, for example advance payment before the execution of service and additional payment or reimbursement after the execution. Payments and deposits may be divided into parts, more advances or repayments. It is the same in the case of payments for other utilities (water, gas, heating, etc.). The most common modelused for payments for energy is a combination of advance payments calculated on the basis of previous years and the subsequent settlement based on actual amount of the consumed energy at the end of the year, and additional payment or refund of the difference between the deposit and the actual amount. It is because no one knows in advance the amount of consumed energy by the customer in the next yearand the supplier doesn't trust customers enough to allow them to pay the full amount after the energy consumption is billed to the customer. Practically the same situation is in the case of telecommunications services, but individual operators offer a much wider range of payment options and there are very popular prepaid cards, which allow the customer to payfor the service in advance Payments in advance are possible in energy billing, such

advance payments bring the following advantages:

- The customer can't consume more energy than he paid, and he can't fall into unsustainable debt.
- Compliance of the individual requirements of customers. Some customers prefer this method ofpayment, even if it is not the cheapest solution for them.
- Payments are made in advance, which means earlier cash for suppliers.
- No additional billing system is needed.
- No charges for disconnecting, connecting or changing customer.
- The customer can pay for electricity at any period.(Tibbenham, 1999)

Due to these advantages and disadvantages of prepaid meters,they are deployed primarily in the following applications:

- defaulters and problematic customers,
- developing countries,
- politically unstable countries,
- lease. (Coetzee, 1995)

**Mast. Yash R. Shete**
TYEE

VSC based HVDC Power Transmission System

VSC based HVDC transmission is one of the HVDC conformation. Their high efficiency, compact size, high reliability, short installation and appointing period and low operating and maintenance cost make it suitable choice for HVDC transmission. The HVDC system with power converter acts as a backbone and provides high reliability with a long useful life to support the AC electrical system. The power conversion i.e. rectification or inversion is achieved by electronic switches which is controllable in a 3-phase bridge structure.

Introduction:

The growing number of HVDC transmission links in forthcoming power system, forces the thoughtful dares on power system control and stability analysis. While better controllability and improvement of inclusive power-system stability is offer by some of HVDC systems, But due to these system various problems on ac bus like simultaneous commutation disappointment of converters, small signal swinging therefore harm voltage quality or cause high above-voltage of bus bar, this all are the local instability's in the system. The increase in voltage level is not always feasible in AC transmission. The movement of power in AC transmission depends on difference of phase angle in vector voltage that varies with the load demand. To investigate the flora and reasons of all this uncertainties, suitable investigative representations of power systems and HVDC links are essential. Today thyristor and thermistor are available in the high power converters technology, which can be called as the fully controlled semiconductor technology. In the converter which is based on voltage source these technology are adopted appropriately. The technologies associated with the flexible ac transmission system (FACTS) and HVdc power transmission systems carry on towards advancement as they having various challenges in the commercial applications. HVdc and FACTS schemes are supporting to the recent power system in their own way, and these are the important skills, in many cases, these schemes are fully or moderately derestricted in several nations. Insulated gate bipolar transistor (IGBTs) and gate turn-off thyristors (GTOs) are used in the forced-commutated VSCs .some times IGBTs are used in the most industrial cases. Figure 2 shows the VSC-HVdc configuration with the IGBT converter connected in back to back topology. This technology is deep-rooted technology for intermediate power levels.
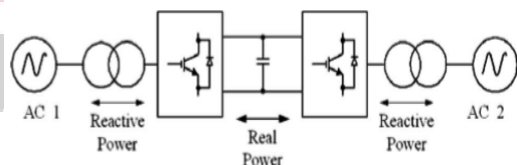

Figure 1: HVDC system based on VSC technology built with IGBTs.

VSC-HVDC power transmission fundamental concepts:

Now, figure 1 shows the straightforward VSC-HVdc system, which encompasses of two converter stations constructed with topologies which is based on VSC. The modest topology of VSC is the predictable three-phase two level bridges is shown in figure 2.

Likewise to guaranties the converter operation of four quadrant an antiparallel diode are required. Also to control the power flow of the system and dc harmonics which introduced in the system can be filtered by using capacitor which is connected in dc bus. That capacitor mainly provides the storage which is necessary for filtering and power flow.
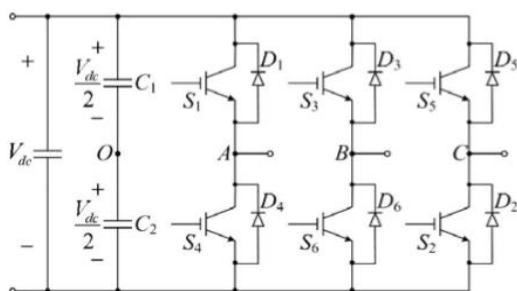

Figure 2: Conventional three-phase two-level VSC topology.

Feedback control system modeling:

For the development of complete power system the feedback control system model is necessary to develop. This model is the ac hybrid model, which consist of 3 synchronous machines with the different ratings. The ac network hybrid model means that the model is divided into two parts, specifically, the dynamic and static parts. The part where HVdc converter is not connected is the static part which is the part of the ac network. In static area, the ac components are demonstrated in phasor theory using as constant admittances. The HVDC converter comes under dynamic area or else dynamic part, that HVdc system is surrounded with the ac components which includes transformers, ac power lines that are demonstrated animatedly via the space vector theory. The voltage source converter (VSC) is the prime unit of a VSC based HVDC system, therefore, its design and performance evaluation is most important to have desired results. This chapter deals with design, modeling and control of VSC for back-to-back AC interconnection and long distanced transmission between two AC networks using HVDC system.
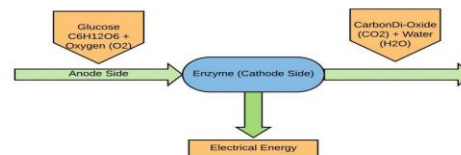
$$P=\frac{Vs\sin\delta}{X_L}Vr \qquad (1)$$

$$Q=\frac{Vs\cos\delta-Vr}{X_L}Vr \qquad (2)$$
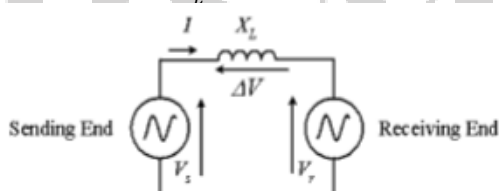
Figure 3: Interconnection of two ac voltage sources through a lossless reactor.

To justify the direction of active power, two voltages are generated and comparative results decides the direction of the flow of active power, where the one voltage is generated by

the VSC and the other one is the ac system voltage. At the fundamental frequency, the phasor relationship defines the active and reactive powers, pretentious is that the ac system reactor connected between the converters is ideal that is lossless, δ is the phase angle between the Vr at the fundamental frequency and the voltage phasors Vs.

Mrs. P. A. Shinde
Lecturer- Electrical Engineering Department

Bio Battery 20136134

A battery is a device which is used to alter the chemical energy to electrical energy. Batteries are classified into different types based on the application, and these are used in several electronics well as electric devices.

What is Bio battery?

A Bio battery is an electrical energy storage device which is used in several applications. This battery can be powered with the help of organic compounds that are available in glucose form that is used in the human bodies. In the human body digestion procedure, as enzymes break-down the glucose electrons, as well as protons, are released. Thus by utilizing enzymes for break-down glucose, these batteries will get energy from glucose directly.

Bio-Battery Working Principle

The working of the Bio battery is shown below the diagram. This system uses the flow of electrons as well as protons for generating electricity. The proton movement can be occurred due to the moving force which is known as current. The electrons flow can be from anode to cathode whereas current flow can be from cathode to anode. The bio-battery working operation is discussed below.In the above figure, glucose is used at the anode side whereas enzyme is used at the cathode side Glucose gets broken down into electrons and protons

The flow of protons can be travel to cathode side via a separator and the flow electrons can be travel to cathode side via a mediator.

Enzymes are utilized at cathode side which generates water by both protons as well as electrons traveled from the anode side.

Above reactions will generate electrons as well as protons in the system. Finally, electric energy will be generated.

Types of Bio-Batteries:

1) Enzymatic Bio-Battery: In this type of battery, biochemical agents (Enzymes) are utilized for a breakdown of a substrate.

2) Microbial Bio-Battery: In this type of battery, Microorganisms such as Escherichia coli, electric bacteria, are utilized for a breakdown of a substrate.

Advantages of Bio-battery:

1) Bio batteries are much faster in charging the devices because of the quick action of the enzymes when we compared to other batteries.

2) Bio-batteries don't require external power supply due to the constant supply of glucose or sugar.

3) Bio-batteries available by a high-energy density and it can be used easily at room temperature.

4) Biobatteries are totally non-polluting, renewable, and also environmentally friendly.

5) Biobatteries are very secure to use due to no leakage and explosions like chemical batteries.

Applications of Bio-battery

Bio-batteries are used in medical implants like pacemakers, insulin pumps, etc.

It can be used as a charger for electronic devices like cell phones, tabs, power banks, etc.

Bio-batteries are used in the defense field in the remote sensing devices, spying devices, as well as surveillance.

Mrs. Nilam Athare
Technical Assistant, E & TC department

Electrodynamic Theaters:

An electrodynamic Tether uses the same principle as electric motor in toys, appliances and computer disk drives.

It works as a thruster, because a magnetic field exerts a force on a current carrying wire. The magnetic field is supplied by the earth.

Description: working with Earth's magnetic field would benefit a number of spacecraft including the International Space Station. Tether propulsion requires no fuel. Is completely reusable and environmentally clean and provides all these features at low cost.

About: To understanding electron and ion current collection to and from the surrounding ambient plasma is critical for most EDT systems. Any exposed conducting section of the EDT system can passively

('passive' and 'active' emission refers to the use of pre-stored energy in order to achieve the desired effect) collect electron or ion current, depending on the electric potential of the spacecraft body with respect to the ambient plasma.

In addition, the geometry of the conducting body plays an important role in the size of the sheath and thus the total collection capability. As a result, there are a number of theories for the varying collection techniques.
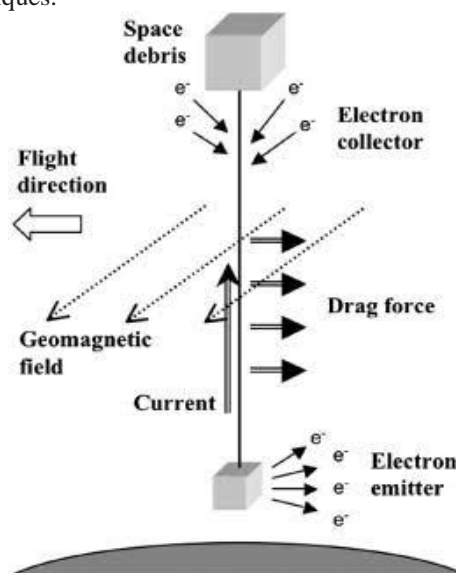
Advantages:
1) The major advantage of reduces de-orbit times
2) It is reusable

Conclusion:-
As electrodynamic tethers can provide long term propellant- less propulsion capability for orbital maneuvering and station keeping of small satellites in low earth orbit, these are preferable compared with the existing rocket propulsion system.

Ms. Pooja Dhondge
SYEJ

Cyber Security

Cyber security is the practice of defending computers, servers, mobile devices, electronic systems, networks, and data from malicious attacks. It's also known as information technology security or electronic information security. The term applies in a variety of contexts, from business to mobile computing, and can be divided into a few common categories.

· **Network security** is the practice of securing a computer network from intruders, whether targeted attackers or opportunistic malware.

· **Application security** focuses on keeping software and devices free of threats. A compromised application could provide access to the data its designed to protect. Successful security begins in the design stage, well before a program or device is deployed.

· **Information security** protects the integrity and privacy of data, both in storage and in transit.

· **Operational security** includes the processes and decisions for handling and protecting data assets. The permissions users have when accessing a network and the procedures that determine how and where data may be stored or shared all fall under this umbrella.

Mrs. S. U. Shelke
IF Department

Types of cyber threats

The threats countered by cyber-security are three-fold:

1. **Cybercrime** includes single actors or groups targeting systems for financial gain or to cause disruption.
2. **Cyber-attack** often involves politically motivated information gathering.
3. **Cyber terrorism** is intended to undermine electronic systems to cause panic or fear.

Malware:

Malware means malicious software. One of the most common cyber threats, malware is software that a cybercriminal or hacker has created to disrupt or damage a legitimate user's computer. Often spread via an unsolicited email attachment or legitimate-looking download, malware may be used by cybercriminals to make money or in politically motivated cyber-attacks.

Cyber safety tips - protect yourself against cyber attacks

1. **Update your software and operating system:** This means you benefit from the latest security patches.
2. **Use anti-virus software:** Security solutions like Kaspersky Total Security will detect and removes threats. Keep your software updated for the best level of protection.
3. **Use strong passwords:** Ensure your passwords are not easily guessable.
4. **Do not open email attachments from unknown senders:** These could be infected with malware.
5. **Do not click on links in emails from unknown senders or unfamiliar websites:** This is a common way that malware is spread.
6. **Avoid using unsecure WiFi networks in public places:** Unsecure networks leave you vulnerable to man-in-the-middle attacks.

Data Science

Data science is an inter-disciplinary field that uses scientific methods, processes, algorithms and systems to extract knowledge and insights from many structural and unstructured data. Data science is a "concept to unify statistics, data analysis, machine learning, domain knowledge and their related methods" in order to "understand and analyze actual phenomena" with data. It uses techniques and theories drawn from many fields within the context of mathematics, statistics, computer science, domain knowledge and information science. Turing award winner Jim Gray imagined data science as a "fourth paradigm" of science (empirical, theoretical, computational and now data-driven) and asserted that "everything about science is changing because of the impact of information technology"

Data Science Examples and Applications

- Identifying and predicting disease
- Personalized healthcare recommendations
- Optimizing shipping routes in real-time
- Getting the most value out of soccer rosters
- Finding the next slew of world-class athletes
- Stamping out tax fraud
- Automating digital ad placement
- Algorithms that help you find love
- Predicting incarceration rates

Understanding big data, and both often involve analyzing massive databases using R and Python. These points of overlap mean the fields are often treated as one field, but they differ in important ways, For one, they have different relationships with time. Data analysts synthesize big data to answer concrete

questions grounded in the past, e.g., "How has our subscriber base grown from 2016 to 2019?" In other words, they mine big data for insights on what's already happened. Meanwhile, data scientists build on big data, creating models that can predict or analyze whatever comes next.

What is the history of the Data Science?

The term "data science" has been traced back to 1974, when Peter Naur proposed it as an alternative name for computer science. In 1996, the International Federation of Classification Societies became the first conference to specifically feature data science as a topic. However, the definition was still in flux.

The term "Data Science" was coined at the beginning of the 21st Century. It is attributed to William S.
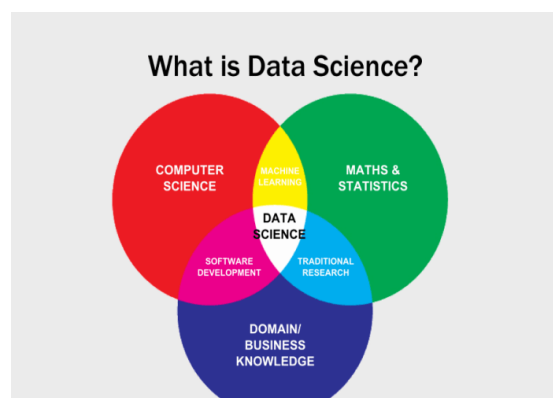
Mr. Yash Manoj Patil
Student-IF Dept.

3d Printing

As one of the emerging technologies in the manufacturing field, the 3D printing technology is developing rapidly and is known as the "manufacturing technology of the industrial revolution significance" The 3D printing technology is the main form of the "additive manufacturing". The concept of "additive manufacturing" is different from the traditional "removing" manufacturing. The traditional numerical control manufacturing generally refers to that based on the raw material, the methods such as cutting, grinding, corrosion are employed to remove spare parts and get the components. Then the final products are combined through assembling, welding and other methods. Different from the traditional method, the "additive manufacturing" can directly produce the objects with any shape by adding materials according to the computer graphical data which simplifies the manufacturing process of the products, shortens the product development cycle and improves efficiency and reduces the costs. The PMW 3D printing service provides 3D printing service in the Nashik city. PMW 3D printing prints the architectural models, car models, mechanical components model, automobile components model, etc.

Mast. Pratik Wavdhane
TYME

Ice-storage Air-conditioning System

Air-conditioning is one of the main factors causing the phenomenon. Thus, the ice-storage air-conditioning is more and more popular and continues to be applied and developed. However, at present, there are many different kinds of system forms of it. It has become the focus of the industry insiders that how to apply it to the actual construction project scientifically and economically. Ice-storage air-conditioning technology is a kind of phase change energy storage. It makes use of the valley load electricity to make ice to storage cool at night and melt ice into water during daytime peak hours. It can release the amount of cool stored in the ice and supply cooling capacity to the load end with refrigeration unit. In order to reduce the pressure of the air-conditioning load during the peak hours of power grid and the installed capacity of air- conditioning system. It can better meet the needs of peak load under the premise of saving energy and capital. It represents the development direction of the central air-conditioning in the world today. The import and research of ice-storage air-conditioning technology started in the early 1990s in China, but developed rapidly. In 1993, the number of the users of ice-storage air-conditioning system is only 2, but this figure increased to 716 by 2015. It is divided into static ice-storage system and dynamic ice-storage

system according to different ice making methods. The first developed and widely used static ice-storage technology is the ice-ball type and ice-on-coil type. The research and application of static ice-storage technology is relatively mature due to starting earlier. But its inherent technical shortcomings are becoming increasingly apparent with the continuous improvement of user's requirements. For this reason, dynamic ice-storage technology such as ice debris sliding type and ice crystal type emerges as the times require. Although the research of it started late, however, due to its improvement of main technical shortcomings of traditional static ice-storage, it has been developed rapidly and used widely in our country in recent years.

1. Working principle of ice-storage air-conditioning system

Ice-ball type ice-storage air-conditioning system is the earliest developed static ice-storage technology. It is characterized in that the water is sealed in a plurality of spherical shells, and the shells are arranged in a groove in a certain order to form a cool-storage device. While making ice, the secondary refrigerant with low temperature flow from the bottom of the ice-storage tank and flow in the gap of each spherical shell, and then make heat exchange with the water in the shell, the water temperature decreases constantly. As the time of cool-storage goes on, ice crystals form and grow rapidly in super cooled water, the water in the shell gradually freezes, the ice grows from the inner wall of the shell to the center, finally the water in the shell is completely frozen into ice. While melting ice, warm ethylene glycol flow again in the gap of spherical shell, make heat exchange with ice ball, making the ice melting from the inner wall of the spherical shell to the center gradually. The temperature of secondary refrigerant decreases constantly and then it is pumped to the refrigeration system to meet cooling capacity which air- conditioning needs .With the gradual promotion of ice-ball type, its inherent technical shortcomings are constantly exposed. People began to seek a better way of ice-storage.

According to the different methods of ice melting, ice-on-coil type ice-storage air-conditioning system is divided into two types: external melting ice-on-coil type and internal melting ice-on-coil type. While making ice, secondary refrigerant ethylene glycol flows into the coils stayed in the ice-storage tank and cycles continuously, makes heat exchange with the water outside of the tube. Finally, the water out of the tube completely frozen from inside to outside along tube after repeated cycling of secondary refrigerant with low temperature. For external melting ice-on-

coil type, while melting ice, the backwater with a higher temperature of air-conditioner flows into ice-storage tank and gets heat transfer with the ice in it by direct contact, making the ice melt from outside to inside. For internal melting ice-on-coil type, the secondary refrigerant with a higher temperature in the tube get heat transfer for the second time with the ice outside to melt it

2. Characteristics of ice-storage air-conditioning system

As one of the most widely used forms in the early stage of the development of the ice-storage air-conditioning, ice-ball type has obvious market advantages. Because the ball shells are made of PE material with advanced technology, they have good corrosion resistance and a long service life. Secondly, the system has the advantages of simple structure and low resistance, and is suitable for various types of cool-storage tanks. The most uncommon thing is that if the individual ball shells are damaged in the process of installation and operation, it will not affect the normal operation of the whole ice-storage system. So it is not easy to cause system failure . However, during the operation of the system, it is difficult to control the icing and ice melting in the ice-storage tank, and the closer to the center of the shell, the more difficult it is to freeze. This requires a lower temperature of making ice, more power consumption and a larger quantity of refrigerant, thus it increases the operating cost. In addition, due to the ball shells needs to be extended several times, so they will be aging deformation leads to leakage. And the special structure of the spherical shells increases the difficulty of maintenance. For ice crystal cool-storage air-conditioning system, because the ice crystal which produced in the ice-storage tank is very small and uniform with the diameter of about 100μm and can be directly pumped to participate in the refrigeration cycle at the load end, the system eliminates the need for secondary cooling medium and heat exchanger. Under the background of the development of the dynamic ice-storage technology, the ice-crystal cool-storage system came into being. Supercooling method is a method of making ice crystals by using the phenomenon of supercooling of water. Because of its simple device and low cost, it has been used in many commercial fields. There are three parts in the process of making ice crystals, which are the subcooler, the supercooling removed device and the ice-storage tank. In the process of making ice crystals, the refrigerator cools secondary refrigerant ethylene glycol to below 0 centigrade and then it is pumped to subcooler.

Table 1 Comparison of characteristics of ice-storage system

| System Type / Characteristics	Ice-ball type	Ice-on-coil type	Ice debris sliding type	Ice crystal type
Cooling method	coolant	Direct or indirect evaporative refrigerant	direct evaporative	Refrigerant direct evaporative cooling mixed solution
Ice-making method	Static state	Static state	Dynamic state	Dynamic state
Ice making rate (%)	55-65	50-60	40-50	50-60
Cold-discharged rate	Slow	Middle	Fast	Very fast
Structure	Simple	Common	Complicated	Simple
Fault rate	Low	High	High	Medium
Initial cost	Low	Medium	Medium	Low
Running expense	High	Medium	Medium	Low
Technical level	Low	Medium	Medium	High
Service life (year)	20	7-15	10-20	10-20
major disaster	Easy to leak	metallic corrosion	Large space required	Frequent ice jam

To sum up, the construction which applies central air-conditioning system, if the region supports the peak valley price, and has the larger cooling load during the day or the cooling time is more concentrated is more suitable for the using of ice-storage air-conditioning system. This will not only save the operating costs, but also can shift peak fill valley. Besides it is conducive to the balance of the national grid. Compared with the dynamic ice-storage, the traditional static ice-storage technology is more mature, but the dynamic ice-storage shows a greater technical superiority and a broader application prospect. However, all kinds of ice-storage air-conditioning systems have their own advantages and disadvantages and cannot be generalized to choose the best. This requires the construction choose the appropriate form of ice-storage system combined with the refrigeration unit to supply cooling capacity efficiently according to their actual situation and the different characteristics of different types of ice-storage, in order to exert user's benefits better while exerting social benefits.

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Laser Physics

Laser is device that stimulates atoms or molecules to emit light at particular wavelengths and amplifies that light, typically producing a very narrow beam of radiation. The emission generally covers an extremely limited range of visible, infrared, or ultraviolet wavelengths. Many different types of lasers have been developed, with highly varied characteristics. *Laser* is an **"Light amplification by the** stimulated emission **of radiation."**
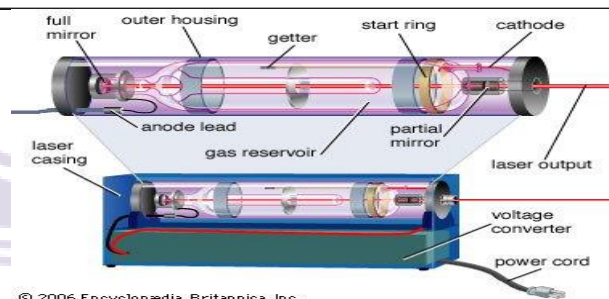
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HISTORY OF LASER:
The laser is an outgrowth of a suggestion made by Albert Einstein in 1916 that under the proper circumstances atoms could release excess energy as light either spontaneously or when stimulated by light. German physicist Rudolf Walther Ladenburg first observed stimulated emission in 1928, a While lasers quickly caught the public imagination, perhaps for their similarity to the "heat rays" of science fiction, practical applications took years to develop.

Fundamental Principles:
Laser emission is shaped by the rules of quantum mechanics, which limit atoms and molecules to having discrete amounts of stored energy that depend on the nature of the atom or molecule. The lowest energy level for an individual atom occurs when its electrons are all in the nearest possible orbits to its nucleus. This condition is called the ground state.

Properties of Laser:
1) Laser are Monochromatic.
2) Laser are Divergences and Directionality.
3) Laser are Coherence.
4) Laser are extremely brightness.

Types of Laser: Crystals, semiconductors, gases, liquids, beams of high-energy electrons, and even gelatin doped with suitable materials can generate laser beams. In nature, hot gases near bright stars can generate strong stimulated emission at microwave frequencies, although these gas clouds lack resonant cavities, so they do not produce beams.

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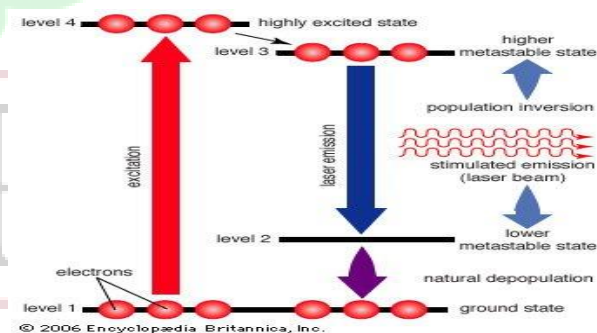
Three level Laser: Many different gases can function as laser media. The helium atoms capture energy from

electrons passing through the gas and transfer it to the neon atoms, which emit light. The best-known helium-neon lasers emit red light, but they also can be made to emit yellow, orange, green, or infrared light; typical powers are in the milliwatt range.

Laser Applications:

1. Laser are used for engraving and embossing of printing plates
2. Laser are used in cutting, drilling & welding metal.
3. Laser are used in Holography.
4. Laser are used in Computer printers
5. Laser are used for 3-D laser scanner
6. Laser are used in controlled heat treatment.

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Happy
Raksha Bandhan, Friendship Day, Krushna Janmashtami, International Youth Day, Independence Day, National Sports Day to
All Readers on the behalf of Principal, Faculty, Supporting Staff and Students.

Dr. D. B. Uphade
Principal