

Rasafyan



Department of
Chemical Engineering

TECHNICAL MAGAZINE



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TECHNOLOGY & SCIENCES (A)**

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FOREWORD

We are immensely excited to publish our first edition of our Department magazine “RASAGYAN”. Although we started out small, with the great support from the Head of the Department, faculty and students we developed this magazine focusing mainly on our Department and its activities all through the academic year of 2015-16.

We hope you find this magazine informational and educational.

Editorial Team



CHEMFLARE-2k15- National Student Conference

National Student Conference CHEMFLARE-2k15 was organized by RACE (Rays of ANITS Chemical Engineer) in the Department of Chemical Engineering during Dec 18th-19th 2015. Dr. S. V. Praveen, Director (operations), L.G. Polymers (P) Limited graced the occasion as the Chief Guest during the inaugural function on 18th. The keynote address was delivered by Dr. Sheshamma, AGM, Quality Assessment and Technology Department, Visakhapatnam Steel Plant on environmental aspects in general and at steel plant and in particular. Mr. G. Vijay Kumar, Consultant, Process Engineers Group gave a talk on Process Simulation: various types of simulation packages, challenges in industries, opportunities in industries by learning process simulation packages. A total number of 57 papers were presented by the students from various universities and institutions. Spot events like Technical Quiz, Elocution and other fun events were also conducted. The valedictory function was graced by Sri V. Appala Raju, IRS, Additional Commissioner of Income Tax.

Dr. Neerukonda Prasad, Chairman ANES, Prof. V.S.R.K. Prasad, Principal, ANITS, Dr. R. Govardhana Rao, Director, (admin.), Prof. S. Subba Rao, HOD, faculty, supporting staff and students of Department of Chemical Engineering took part in the CHEMFLARE-2k15 and it was a grand success.



Our Planet

Opinion of Earth about our planet (herself) as one among us i.e., as a living human....!!!

Coming up here onto the magazine today, I have no agenda. I am fighting for my future. Losing my future is not like losing an election or a few points on the stock market or failing in exam or breakup with lover. I am here to speak for all generations, I am here to speak on behalf of starving children around the world where cries are being heard. I am here to speak for the countless number of animals, dying across this planet because they have nowhere left to go. I am afraid to go under the sun now, because of the holes in ozone. I am afraid to breathe the air because I don't know what chemicals are in it. I used to go fishing with my dad and just a few years ago we found a fish full of cancers. And now we hear animals and plants go extinct, everyday vanishing forever. In my life I have dreamt of seeing the hurts of wild animals, jungles and wild forests full of birds and butterflies but now I wonder if they will even exist for my children to see. Did you worry of these things when you are of my age? All this is happening before our eyes and yet we act as if we have all the time we want and all the solutions. I don't have all the solutions, but I want all of you to realize. You don't know how to fix the holes in ozone layer, and you don't know how to bring back a dead stream live, and you don't know how to bring back an animal now extinct and you can't bring back the forest that once grew but there is now a desert. If you don't know how to fix it, please stop breaking it. Here, you the readers may be faculty, mentors, students, delegates of government, organizers, etc. But really your mothers and fathers, sisters and brothers, aunts and uncles, and all of you are someone's child. I am only one, yet I know we are all part of a family. In fact millions of species were extinct and many are ready to go vanquished. Governments will never change that. You must change your ways. I know we are all in this together and should act as one single world towards one single goal. In my fear I am not afraid of telling the world how I feel. I know if all the money spent on war, will spent on finding the environmental answers, ending poverty, and finding treaties, what a wonderful place this earth would be.

YOU are what YOU do..!!!

-S.S.N.V.VaraLakshmi(I/IV)

‘Infosys’

Infosys technologies limited is an Indian multinational provider of consultancy, technology, engineering and outsourcing services. It is headquartered in Bangalore, India with offices across 30 countries like US, China, Australia, UK, Canada, Japan and more.

In 1981, N.R. Narayana Murthy and his six colleagues, N.S Raghavan, S. Gopala Krishnan, S.D. Shibulal, K. Dinesh, Ashok Arora started Infosys with great zeal and hard work. Till then Murthy was passionate about creating good quality software. He had a vision but zero capital. His wife Sudha Murthy gave him Rs. 10,000 which she had saved, without his knowledge and told him, “This is all I have”. Today, Infosys is a global leader in the sectors of IT and consultancy with revenues in billions, however the current economic crisis is showing it’s impact.

The company grew slowly until early 1990s, but after Indian government’s decisive move towards economic liberalization and deregulation, a dramatic growth in the country’s high-technology and computer sectors was seen. Infosys aggressively expanded its services and client base, negotiating deals with many overseas business firms to provide them consultancy, systems integration, software development, and product engineering services. By 1999 Infosys had joined NASDAQ, becoming the first Indian company to be listed on an American stock exchange.

Employees:

Infosys had a total of 1,56,688 employees as on 31st March 2013, of which 34.7% were women. During Financial Year 2012-13, Infosys received 378,994 applications from prospective employees and had a gross addition of 37,036 employees.

Initiatives:

In 1996, Infosys established the Infosys Foundation, to support the underprivileged sections of society. A team at the Foundation identifies programs in the areas of Healthcare, Education, Culture, Destitute care and Rural Development. It also organizes Infosys Labs, Infosys Prize program and Instep etc.

Awards and Recognitions:

- ✓ It was ranked 19 amongst the world's most innovative companies by Forbes.
- ✓ Boston Consulting Group has listed it in the list of top ten technology companies for shareholder return.
- ✓ The company also won the Oracle Excellence Award for Specialized Partner of the Year North America in both Financial Management and Human Capital Management categories, at Oracle Open World 2012.
- ✓ Infosys was also ranked as the 15th most trusted brand in India by The Brand Trust Report. N.R. Narayana Murthy

About the Founder:

Murthy earned a bachelor's degree in electrical engineering from the University of Mysore and a master's degree from IIT- Kanpur. He is known to be a visionary leader who motivates his employees and leads by example. He served as the CEO of Infosys for 21 years and was succeeded by co-founder Nadan Nilekani (currently Chairman of UIDAI project) in 2002. In August 2011, he retired completely from the company and taking the title Chairman Emeritus. On 1 June 2013, Murthy was appointed as Additional Director and Executive Chairman of the board for a period of five years with salary of Rupee 1 per year.

- Murthy has been listed among the 12 greatest entrepreneurs of our time by Fortune magazine.
- He has been described as Father of Indian IT sector by Time magazine due to his contribution to outsourcing in India.
- Murthy was also honored with The *Padma Vibhushan* and *Padma Shri* awards.

-V.Karthik(I/IV)

STUDENT PRESENTATIONS

1. Mr. B. Hemanth Kumar & Ms. D. Deena of III/IV Chemical Engineering presented a paper on “Activated Carbon from Potato Peels as Adsorbents for the Treatment of Pharmaceutical Effluents and its Other Applications” in STEPCONE2K16 organized by Department of Chemical Engineering, GMRIT, Rajam, during 8-10 January, 2016.
2. Mr. G. Siva Rama Krishna Reddy & Mr. Ch. Lakshman Naidu of III/IV Chemical Engineering presented a paper on “Green Methods for the Production of Nanoparticles” in STEPCONE2K16 organized by Department of Chemical Engineering, GMRIT, Rajam, during 8-10 January, 2016.
3. Mr. V. Praveen Kumar & Mr. R. V. S. Pramodh of III/IV Chemical Engineering presented a paper on “Chromatography - A Sophisticated Separation Technique” in STEPCONE2K16 organized by Department of Chemical Engineering, GMRIT, Rajam, during 8-10 January, 2016.
4. Mr. C. S. R. Karthik, Mr. P. Vedavyas Varma & Mr. Ch. Rohith of III/IV Chemical Engineering presented a paper on “Photocatalytic Degradation of E. Coli using Synthesized Titanium Dioxide” in STEPCONE2K16 organized by Department of Chemical Engineering, GMRIT, Rajam, during 8-10 January, 2016.
5. Ms. P. V. Sai Sudha & Mr. D. Rajesh of II/IV Chemical Engineering presented a paper on “Trigeneration Systems with Fuel Cells” in STEPCONE2K16 organized by Department of Chemical Engineering, GMRIT, Rajam, during 8-10 January, 2016.
6. Sairam M., Rajesh T & Sateesh P of III/IV Chemical Engineering have presented a paper on “Biogas and Making Pressurized Water Scrubbing the Ultimate Biogas Upgrading” in CHEMFLARE-2k15 organized by Department of Chemical Engineering, ANITS, Vishakapatnam, during 18-19 December, 2015.
7. P. Ashish Kumar of IV/IV Chemical Engineering have presented a paper on “Bloom box-the Electricity Generating Boxes for Tomorrow” in CHEMFLARE-2k15

organized by Department of Chemical Engineering, ANITS, Vishakapatnam, 18-19 December, 2015.

8. B. Hemanth Kumar & D. Deenaof III/IV Chemical Engineering have Presented a paper on “Modified Activated Carbons from Potato Peels as Adsorbents for the Treatment of Pharmaceutical Effluents” in CHEMFLARE-2k15 organized by Department of Chemical Engineering, ANITS, Vishakapatnam, 18-19 December, 2015.
9. D. S. Sai Ram & K. Prabhakar of III/IV Chemical Engineering presented a paper on “Removal of Slag Deposits on Boiler Tubes and Improving its Heat Transfer” in CHEMFLARE-2k15 organized by Department of Chemical Engineering, ANITS, Vishakapatnam, during 18-19 December, 2015.
10. K. Aditya of IV/IV Chemical Engineering have presented a paper on “Synthesis of Magnesium Fluoride Nano Particles for Anti-reflective Applications” in CHEMFLARE-2k15 organized by Department of Chemical Engineering, ANITS, Vishakapatnam, during 18-19 December, 2015.
11. P. Swetha Priyadarshini of M. Tech. Bio Technology have presented a paper on “Modeling of Microbial Reactors for the Surface Cultivation of *Chromobacterium violaceum*” in CHEMFLARE-2k15 organized by Department of Chemical Engineering, ANITS, Vishakapatnam, during 18-19 December, 2015.

Arts and Science

Studies intended to provide general knowledge and intellectual skills. Science is a human quality of learning scientific things and one's ability to produce solutions in some problem domain, but without arts (intellectual skills) we cannot implement that solution in bringing change in the society.

Role of Arts in Sciences:

Our university makes us good engineers by providing us knowledge in various scientific disciplines. With all that education received, one can definitely become a great engineer in the future (A person who can improvise the present day technology by

developing different gadgets) but just that scientific knowledge is not sufficient to prosper in that particular field. We need to work under different firms as per their rules and regulations which demand qualities like moral values and confidence to cope up with all the problems which we have to face. For that we need a great human heart==> Humanity==> Liberal Arts. Science leads us to a good position whereas Arts teaches us how to be a good person in the society. If we have knowledge in both then we will be the perfect humans with moral values. All great scientists belong to that category. Epics also come under Arts, memorizing one situation from the epic Ramayana which reflects our present day technology i.e., construction of Ramasethu bridge (which presently are taught in Civil Engineering). Now-a-days, we are in a society where people know how to use 4G or smart phone technology but they really don't know the meaning of life and that's why many relations couldn't be maintained for a long time. With this we come to know the importance of Liberal Arts. Our institution provides us with Liberal Arts as minor course which is comprised of Big History, Great Books, Shakespeare, Technical writing and many more

Brief description about Big History:

Big History surveys the past of the largest possible scales and it does so using the best available information from many different disciplines.

It starts with:

- Origin of Universe
- Goes into the future
- Get a sense of logic behind it.

We will study 13 billion years of human evolution and their civilization in a 3 week semester in the course of Big History. It raises fundamental questions about the meaning of history and human place in the cosmos.

Brief description of Great Books:

Great books should have a great theme, written in noble language which elevates the soul and speaks across the ages. People cannot read a great book and learn from it unless they are going to enter sympathetically into the mind of the author. By these

great books we can define a good man as a man who practices “justice, moderation, wisdom and courage”. These great books educate us to live our life’s freely and responsibly. The ultimate lesson of these great books are to never give up, live your life and realize that every day you can begin again. These books educate us with some themes like “Fate, God, Meaning of life, Truth, Duty and Responsibility, Courage, Love, Jealousy, Ambition, Redemption, Death”. There are different stories explaining usefulness of each one of the theme. From these books we can differentiate between what will be result for good things & bad things and what one should do & not to do. Not only reading those books if we apply those moral values in our lives then we can lead our life with peace and joy. A great book summarizes the enduring values and ideas of a great age and gives them as a legacy to future generations.

Apart from these if we look at the Shakespearean era, Shakespeare was a master of human reality. He didn’t present people as ideals but portrayed their true behaviour and motivations. His stories comprised of tragedies, comedies and historical sensations. This course offers us with some plays like Othello, Romeo-Juliet Julius Caesar, Macbeth etc.

In Technical writing course one is educated in how to write letters in different aspects mainly we are concerned about writing our resume, applying to different job interviews, writing letters to higher officials with different designations in formal way. Not only these there are many other things which increase our intellectual skills and finally making one succeed by knowing the real meaning of life that lie in practicing moral values. From the above description, one can understand the importance to studying arts along with Science.

-PavanKumar(II/IV)

Touch ScreenLaptop

PortronicsHandmate pen is a revolutionary device in the industry which will create your normal non-touch windows & laptop into a touch screen laptop and you get it at fraction of the cost. It seems so useful, doesn’t it? Lets find out more about it.

Protronics:

First of all, let's see how to use it with your Windows 8 laptop. It's easy to plug it and use it. Just connect it to any USB port of your laptop and fix the receiving unit on any edge of the screen. After this, in control panel go to 'Tablet PC settings' and then calibrate the screen. In barely a minute, your touch screen laptop is ready to be used!

How it work's

Once the set up is done, put batteries into the stylus-shaped pen. Now the laptop can be operated by touching the screen with this pen. You can slide, swap or drag through the screen of your Windows 8 laptop. Playing games like 'Cut the Rope' or adding touch screen experience of painting is just so easy.

Apart from fun and games, you can use Microsoft Office too in an easy manner, you can over-write in your own hand-writing while explaining things to someone else and even high-light the important part on an document using this pen. You can check mail, browse through web, perform zoom in and out and much more.

Let's have a look at the specifications of the Hand mate Windows 8 pen:

- The Hand mate Windows 8 Pen comes with sensors of Ultrasonic and Infrared technologies.
- It has a resolution of 100 Dots Per Inch and accuracy of 2 mm.
- It comes with a spare stylus and its power source is a battery.
- It claims 500 hours of battery life with its 1:9 ratio of working and standby time.
- It works with the screens sized 16-inches or below 16-inches.

The best part is that it is available just for Rs. 4999/-, which means that you can add touch-screen experience to your Windows 8 laptop using an option which is not-so-expensive as compared to an expensive touch-screen laptop/Computer. It is the best that you can get in such a humble price.

-Aadesh Katragadda(III/IV)

STUDENT ACHIEVEMENTS

1. D. S. Sai Ram & K. Prabhakar III/IV B.Tech. won **second** prize for paper presentation on “Removal of slag deposits on boiler tubes and improving its heat transfer” in CHEMFLARE-2k15 organized by Department of Chemical Engineering, ANITS during 18-19 December 2015.
2. K. Aditya IV/IV B.Tech won **First** prize for paper presentation on “Synthesis of magnesium fluoride nano particles for anti-reflective applications “ in CHEMFLARE-2k15 organized by Department of Chemical Engineering, ANITS during 18-19 December 2015.
3. B. Hemanth Kumar & D. Deena III/IV B.Tech won **Second** prize for Technical Quiz in CHEMFLARE-2k15, organized by Department of Chemical Engineering, ANITS during 18-19 December 2015.
4. P. Swetha Priyadarshini, M. Tech. (Bio technology) won **First** prize for paper presentation on “Modeling of Microbial Reactors for the Surface Cultivation of *Chromobacterium violaceum*” in CHEMFLARE-2k15 organized by Department of Chemical Engineering, ANITS during 18-19 December 2015.
5. P. Ashish Kumar M. Tech. (Bio technology) won **Second** Prize in Elocution in CHEMFLARE-2k15 organized by Department of Chemical Engineering, ANITS during 18-19 December 2015.
6. C. S. R. Karthik , P. Vedavyas Varma & Ch. Rohith III/IV B.Tech Chemical Engineering has won **second** prize for paper presentation on “Photocatalytic Degradation of E.Coli using Synthesized Titanium Dioxide “ in STEPCONE2K16 organised by Department of Chemical Engineering, GMRIT, Rajam during 8-10 January, 2016.
7. Mr. BK Prabhakar of III/IV Chemical Engineering participated in National Level workshop on Industrial Automation - PLC & SCADA in SHAASTRA 2016 organized by Department of Chemical Engineering, IIT Madras, 23-24, Jan. 2016

FACULTY PUBLICATIONS

1. **V. Sridevi**, M. Padmaja, A. Sahitya, N. HarshaVardhan, **G. H. Rao**, “Application of Box-Behnken Design for the Optimized Production of Lactic Acid by Newly Isolated *Lactobacillus plantarum* JX183220 using Cassava (*Manihotesculenta*Crantz) Flour”, *British Biotechnology Journal* ,9(2), 1-9, September 2015.
2. **Ch.Anil**, R. Padmasree, “PID Control of Integrating Systems using Multiple Dominant Poleplacement Method”, *Asia-Pacific Journal of ChemicalEngineering*, Vol 10, Issue 5, pp. 734-742, September-October, 2015.
3. V. S. R. K. Prasad, V. G. S. G. Siva Prasad, **V. Sridevi** and K. G. Sudarsan”Biodegradation of Ammoniacal Nitrogen to Nitrite in anIndustrial Effluent using *Nitrosomonas species*: First stage inNitrification”*Journal of Chemical, Biological and Physical Sciences*, 5(4), 4733-4740,2015.
4. A. Swathi,**V. Sridevi** , and G. H. Rao “Optimized Lactic Acid Production from Whey using Hybrid Design and Ridge Analysis”, *Journal of BioChemical Technology*,6(1),945-951:2015.
5. **V. Sridevi**, A. Kiranmai and P. Anvesh “A comparative study on biodegradation of ammonium nitrogen to nitrite in fertilizer effluent by *Nitrosomonas species* (NCIM 5071) and *Nitrosomonaseuropaea* (MTCC 134)”, *Asian Journal of Microbiology, Biotechnology and Environmental sciences*, 18,1, 2016.

EXCELLENCE

Rabindranath Tagore, M.S Subhalakshmi, Mother Theresa and Sachin Tendulkar all of them are household names in India. Tagore was a celebrated poet and author who won the Nobel prize. Subhalakshmi was the doyen of Indian music who performed all over the world. Mother Theresa renowned for her service to the sick and dying which brought her Nobel prize. Sachin Tendulkar, an icon in the world of cricket who records. Is there anything in common among these great men and women from such diverse

professions? All four of them are known for excellence in their respective fields. They have set high standards and have become role models for others in their chosen professions.

There are many lessons we can learn from the lives of the men and women who have achieved excellence in their fields of Endeavour. The common attributes shared by all of them are passion, focus, hard work, perseverance and the use of innate abilities.

A passion for the profession:

In order to achieve excellence in any profession, a person needs to be passionate and committed to the work she/he is engaged in. Passion is the spring-board of dreams to achieve great things. It's an attribute we find in the achievers of excellence in all fields. The motivation and commitment they display are visible and inspiring to those who come across them. Mother Theresa's passion to serve the dying was amply reflected in actions, speeches and demeanor. Where there is no passion, motivation will be weak and commitment to the profession will be difficult to sustain.

A Sharp focus on work:

It's difficult to be excellent in a variety of fields at the same time. Attention will be diffused and the concentration needed to achieve excellence will be diluted when multiple and diverse professions have to be perused. The knowledge to be mastered and the complexity of the work are so demanding that limits one's focus to an area where one can excel is terribly important. A great scientist cannot easily excel in different sciences at the same time, though there are some who have contributed to more than one science.

Excellence is achieved when we put in our best efforts to attain the highest standards in any activity that we take up. We can all be excellent in what we do and wherever we are.

-ManikantaVemrapu(III/IV)

FB Bug

Post, Like, Share, Comment, Chat, Finding new friends, and what else can you do after jumping into Facebook? "What else?" you might ask. Here is the guy who discovered a bug (a fault or defect in a program) in 'Facebook website' and rewarded by Facebook itself and got a chance to work further for Facebook in future! Here comes the story.

The discovery of a bug on a popular social net-working site has won a 21-year-old engineering graduate a reward of Rs. 8 lakh. The malfunction reportedly enabled users on Facebook to remove pictures from other accounts without the knowledge or approval of the owner. For his discovery, city youth Arul Kumar was awarded with Rs. 8,12,500/- as part of Facebook's bug bounty programme through which it incentivises those who find flaws on the networking site.

The student, who hails from Salem, Tamilnadu, graduated from Hindustan Institute of Technology in Coimbatore in June and is now in Chennai on the look-out for a job.

“I have always been interested in the security of frequently used websites such as Google and Facebook. There has to be a bug somewhere, and I keep testing every feature of these sites,” said Arul

It was during one such testing exercise that he wondered if photos uploaded on Facebook by a user could be removed by others. Users are aware of two ways to remove a picture from the site — either the account owner removes it or somebody else who has a problem with it uses the dashboard to request the Facebook team to remove it, said Arul.

-AkshitGosala(II/IV)

Silence is Insane !!!

Sometimes we feel to be solitary and prefer to stay alone in a quiet place. But do you know the most quietest place in the world ???

It is the “Silent room”, popularly known as “Anechoic Chamber”. This insane room is a part of the Orefield Laboratories situated at Minnesota , U.S.

Anechoic Chamber is recorded as the world's “Quietest room” in the Guinness Book of World Records. This Anechoic chamber mutes 99.9% of all the sound in the room. “Anechoic” means “NO ECHO”. The walls and floors of this room are made of the sound proof fibreglasswedges , insulated with steel and concrete. These floors and walls absorb all the sounds unlike other walls that reflect the sound. Sound level in this room is -9db which is very less compared to a normal quiet room hav-ing a sound level of 30dB.

One can listen their own heartbeat, lung functionality, intestinal sounds and minute sounds made by our ears as we stay in this room. This room wholly helps in detecting

the noise levels made by LEDs. This is also used by NASA scientists to test whether the astronauts will be able to stay in silence that they would experience in space.

Whirlpool and Harley Davidson companies have taken permission to check the noise made by their products in the silent room. This room is rather much harmful than doing good to humans. It makes people INSANE. Silence for long time makes people stressed out. As this room is 100% sound proofed, one can hear the sound made by their organs with an amplified volume. It has ultimately proved to be the most unpleasant experience in the dark. As a result of this, human mind loses its grip and finally become insane.

Till today, it is only just 45min that a person could stay in this continuously which is a Guinness Record so far.

Do you want to stay in this room once ???

-Ajay Chowdaray(I/IV)

GUEST LECTURES

1. INTERACTIVE SESSION

Guest lecture cum Interactive session was organized by the Department of Chemical Engineering, ANITS on 21st Sept. 2015. The session was initiated by **Dr. Paruchuri Gangadhar Rao, Vice chancellor, University of Science and Technology, Meghalaya** and was taken upon by **Dr. Rama Brahman, Senior Principal Scientist, Central Leather Research Institute, Chennai**. Topics like current job scenario in Chemical Engineering, pursuing higher studies in India and abroad, role of Chemical engineer in the society in solving problems like solid waste management, pollution control, alternative energy sources and conservation of energy were discussed. Industrial safety and troubleshooting problems in industries were also discussed along with specific examples.



Dr. Paruchuri Gangadhar Rao addressing the students

Fax machine

We can see much advancement in technology these days. One of those advancements is facsimile machine.

What is fax machine?

Facsimile or fax machine is an electronic system, used for sending graphical information through wires or through free space with the help of electro-magnetic radiation.

Firstly, the information to be sent is **SCANNED** by a beam of light (working is fairly similar to Xerox machine). While scanning, some part of beam is reflected and it varies depending on the details in the information. The reflected light is then converted into an electrical signal with the help of a Charge Coupled Device (CCD) and electronic memory circuits. Then the signals are transmitted over a telephone line or into free space. By the opposite process, the transmitted graphical information is reproduced in printed form (on paper) at the receiving end of fax machine. In short, any information in printed form on paper can be sent with the help of fax machine.

How a document is scanned in fax machine?

Scanning mechanism in fax machine:

The paper is fed into the rollers as shown in figure. A beam of light from source is focused on the paper. Reflected beam from surface of the paper is incident on mirror assembly and finally is incident on CCD (Charge Coupled Devices).

CCD is a light sensitive semiconductor device which consists of several reverse biased silicon photodiodes arranged in a matrix on silicon chip. The reverse biased Si diodes convert reflected light into respective electrical signals.

Note that complete information on paper is **NOT** stored on CCD at one go. The beam scans the paper horizontally (i.e. along width of paper, row-by-row). When it goes from one end to another, the CCD is occupied. Then charged information on CCD is given out to electronic memory and the process continues till the complete paper is printed.

Block diagram of fax machine – following figure shows a modern G3-type of fax machine. The description of each block in it is given below –

Block diagram of fax machine:

Transmitter block – when some printed paper is inserted into fax machine, it is scanned row-by-row. The CCD converts this information into proportional analog signals. This output is fed to A/D converter circuit. Its output is in digital form. This digital data becomes extremely huge due to scanning details in the document. So it is compressed with the help of digital data compression circuit. This circuit is designed by using VLSI (Very Large Scale Integration). Hence, the obtained size of data in bits (binary digits) is reduced, which enables faster transmission with small storage memory. This size of data in terms of bits is sufficient to represent the image of document.

The compressed data is fed to a modulator that acts like a modem, can modulate & demodulate digital data. In modem, a carrier wave is modulated using the data and transmitted over telephone line.

Receiver block – when fax signal reaches the receiver block through telephone line, it is then demodulated using demodulator within the modem. Data obtained will be in compressed form. To expand the data, it is fed to digital data expansion block which is designed in VLSI (Very Large Scale Integration). The original data is thus recovered. Signals are then fed to thermal printer.

This printer requires special HEAT SENSITIVE PAPER. The head (stylus) of printer, which prints the information on paper, has tiny heating elements (coils). These elements rapidly turn on/off, depending on the signals received. It moves on the paper and burns it into black. This way, it prints the original document.

Control blocks – Its a very complex circuit used for HANDSHAKING between two fax machines, during communication. During this process, different audio tones and beeps are produced and exchanged. This process

takes place as follows –

- When a fax machine is dialed, called machine responds to it by producing an audio tone.

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- The calling machine sends synchronous signals, so both machines start at the same time.
 - The called machine compares this signal as per its own standards and acknowledge the signals. Then the printing begins.

-K. Aditya (IV/IV)

FACULTY PARTICIPATION

1. Prof S. Subba Rao Dr. M. Shiva Naresh & Dr. K China Malakondaiah, participated in workshop on “**Smart Technologies for Waste Management for Smart Cities**” conducted by SEAC & SEIAA, A.P, on 26th Nov. 2015.
2. Mr. M. Koteswara Rao, participated in workshop on “**Fundamentals of Downstream Process Technologies**” conducted by JNTU-K, Kakinada, during 23-24, Jan., 2016.
3. Prof. S. Subba Rao, Head, participated in workshop on “**DESALINATION- InDACON-2016**” conducted by A. U., Visakapatnam, during 29 - 31, January, 2016.
4. Prof. S. Subba Rao, Engineering participated in workshop on “**Nuclear Energy and Future Perspectives in India Context**” conducted by ANITS, Vishakhapatnam, during 10 -11, Feb. 2016.
5. Ms. Sailaja, Dr. K. China Mala Kondaiah, Mr. Koteswara Rao M., Ms. S. Harika, Ms. P. Mallika Rani, Ms. Lalita, participated in the training programme (FDP) on “ **INSTRUCTIONAL DESIGN AND DELIVERY SYSTEMS**” conducted by ANITS from 16th to 21st, June 2015.

INDUSTRIAL VISITS

M/S Coromandel International Ltd.

The Department of Chemical Engineering conducted an Industrial Visit for III/IV B.Tech students to M/s Coromandel International Limited on 28/11/2015. Faculty coordinators Ms. Sailaja.P and Mr. M. Koteswara Rao accompanied the students. Mr. P. Rama Krishna Mohan, AGM, Training, Coromandel International limited, Vizag has briefed about Coromandel International Limited and Murugappa group and Mr.M.PrasadBabu of Technical Training Department, has detailed about the entire process. After the session two buses were arranged to show all the plants of the industry. The students had a glimpse of the major processing equipment and enjoyed the industrial visit.



M/S Govada Sugar Factory

The Department of Chemical Engineering organized an Industrial Visit for III/IV B.Tech. Chemical Engineering students to M/S Govada Sugar Factory, Chodavaram on 13-02-2016. Dr. Ch. Anil and Dr. K. China Malakondaiah, faculty coordinators and 50 students visited the factory. Unit operations like crushing, clarification, evaporation, crystallization, centrifuging were shown and well explained by the concerned people of the sugar plant. The students were benefitted by the practical exposure of the various equipment involving the unit operations. Overall the students felt the visit very interesting and useful.



EPILOGUE

We sincerely thank all our Department faculty and non teaching staff for their support and trust and a great gratitude to all the students without whom this magazine would not be possible.

We hope you had a great time reading this magazine and we are going to acknowledge every feedback from you to improve further by the next time. Shout at us back at editor.rasagyan@gmail.com.



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