VOL 5 | ISSUE 2 | JULY 2020

MECHZINE

GET TO KNOW THE WORLD !

IMPACT OF COVID-19 ON ENGINEERS

R.V.R. & J.C. COLLEGE OF ENGINEERING, GUNTUR
KNOWLEDGE IS POWER
Estd 1985

A STUDENT INITIATIVE TECHNICAL MAGAZINE

VOL 5 | ISSUE 2 | JULY 2020

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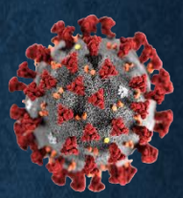
COVID 19 Pandemic		3
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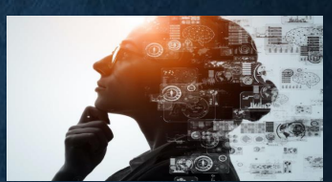
Faculty Article Impact of Covid-19 on Engineers		6
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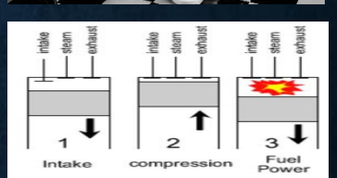
Faculty Article Six Stroke IC Engine		9
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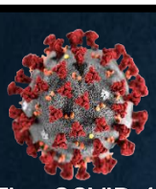
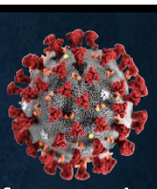
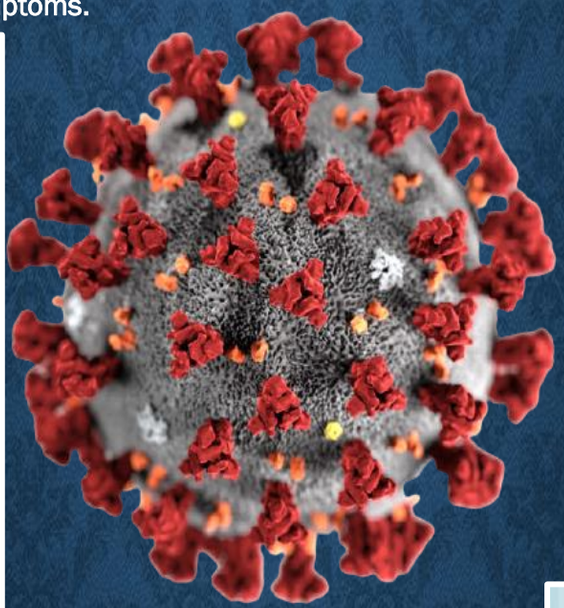


COVID-19 PANDEMIC



The COVID-19 pandemic, also known as the coronavirus pandemic, is an ongoing pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It was first identified in December 2019 in Wuhan, China. The World Health Organization declared the outbreak a Public Health Emergency of International Concern in January 2020 and a pandemic in March 2020. As of 13 February 2021, more than 108 million cases have been confirmed, with more than 2.39 million deaths attributed to COVID-19. Symptoms of COVID-19 are highly variable, ranging from none to life-threatening illness. The virus spreads mainly through the air when people are near each other. It leaves an infected person as they breathe, cough, sneeze, or speak and enters another person via their mouth, nose, or eyes. It may also spread via contaminated surfaces. People remain infectious for up to two weeks, and can spread the virus even if they do not show symptoms.

Recommended preventive measures include social distancing, wearing face masks in public, ventilation and air-filtering, hand washing, covering one's mouth when sneezing or coughing, disinfecting surfaces, and monitoring and self-isolation for people exposed or symptomatic. Several vaccines are being developed and distributed. Current treatments focus on addressing symptoms while work is underway to develop therapeutic drugs that inhibit the virus. Authorities worldwide have responded by implementing travel restrictions, lockdowns, workplace hazard controls, and facility closures. Many places have also worked to increase testing capacity and trace contacts of the infected.



Many educational institutions have been partially or fully closed.

The responses to the pandemic have resulted in global social and economic disruption, including the largest global recession since the Great Depression. It has led to the postponement or cancellation of events, widespread supply shortages exacerbated by panic buying, agricultural disruption and food shortages, and decreased emissions of pollutants and greenhouse gases.

Alumni Article

QUARANTINE WISDOM

The Reason Why We Worry.

- N.V.S Srikar

Amid pandemic, with the world battling covid19 crisis, I felt I turned wise all at once. I came across something in our bathroom the other day which has occupied my thoughts off and on since. It was a little dispenser of my toothpaste. It isn't the paste itself that is of interest to me, but that the container has a free phone number painted on it. You can call the company's Hotline 24 hours a day. But why would you need to? I keep imagining some guy calling up and saying in an anxious voice: "OK, I've got the paste. Now what?" As a rule of thumb, I would submit that if you need to call a provider you are probably not ready for this level of oral hygiene. My curiosity aroused, I had a look through our cupboards and discovered that nearly all household products in India carry a hotline number. You can ring up for guidance on how to use soap and shampoo, gain helpful tips on where to store ice-cream so that it doesn't melt, and receive professional advice on which parts of your body you can most successfully and stylishly apply nail polish to. ("So let me get this straight. You're saying not on my forehead?")

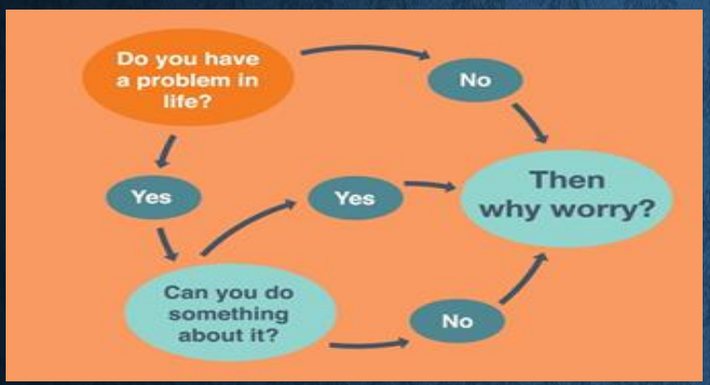
For those who do not have access to a mobile phone, or who perhaps have a telephone but have not yet mastered its use, most products also carry helpful tips such as "Remove shells before eating" (on peanuts) and "Caution: do not re-use as beverage container" (on a bleach bottle). We recently bought an electric iron which admonished us, among other things, not to use it in conjunction with explosive materials. In a broadly similar vein, I read a couple of weeks ago that computer software companies are considering re-writing the instruction "Strike any key when ready" because so many people have been calling to say they can't find the "Any" key. First, I read in the paper how John Smoltz, a pitcher for the Atlanta Braves baseball team, showed up for training with a painful red welt across his chest and, when pressed, sheepishly admitted he had tried to iron a shirt while he was wearing it. Second, although I have never done anything quite as foolish as that, it was only because I had not thought of it.

Third, and perhaps most conclusively, two nights ago I went out to run two small errands — specifically, to buy some toothpaste and post some letters. I bought them, carried it straight across the street to a letter box, opened the lid and deposited it. I won't tell you how far I walked before it dawned on me that this was not a 100 per cent correct execution of my original plans. You see my problem. People who need labels on pillar-boxes saying "Not for deposit of toothpaste or other personal items" can't very well smirk at others, even those who iron their chests or have to seek lathering advice from a shampoo hotline.

I mentioned all this at dinner the other night and was appalled to see the enthusiasm with which all the members of the family began suggesting labels that would be particularly apt for me, such as "Caution: when door says `Pull', it's absolutely no use pushing" and "Warning: do not attempt to remove sweater over head while walking among chairs and tables". A particular favorite was "Caution: ensure that shirt buttons are in correct holes before leaving house". This went on for some hours.

I concede that I am somewhat inept with regard to memory, personal grooming, walking through low doorways, and much else, but the thing is, and it's my genes. Allow me to explain. I recently tore out of the newspaper an article concerning a study at the University of Michigan, or perhaps it was the University of Minnesota (at any rate, it was somewhere cold with "University" in the title), which found that absent-mindedness is a genetically inherited trait. I put it in a file marked "Absent-Mindedness" and, of course, immediately mislaid the file. In searching for it over internet, I found another file intriguingly marked "Genes and So On", which is just as interesting and — here was the lucky part — not altogether irrelevant. In it I found a copy of a report from the 29 November 1996 issue of the journal Science entitled "Association of Anxiety-related traits with a Polymorphism in the Serotonin Transporter Gene Regulatory Region". The upshot of the study is that

scientists have located a gene which determines whether you are a born worrier or not. To be precise, if you have a long version of the SLC6A4 gene, you are very probably easy- going and serene, whereas if you have the short version, you can't leave home without saying at some point: "Stop the car. I think I left the bath water running." What this means is that if you are not a born worrier then you have nothing to worry about (though, of course, you wouldn't be worrying anyway), whereas if you are a worrier by nature there is nothing you can do about it, so you may as well stop worrying, except, of course, you can't. Now put this together with the findings about absent-mindedness at the University of Somewhere Cold, and I think you can see that our genes have a great deal to answer for.



Here's another interesting fact from my "Genes and So On" file. According to Richard Dawkins in The Blind Watchmaker, each one of the 10,000 billion cells in the human body contains more genetic information than the entire Encyclopedia Britannica (and without sending a salesman to your door), yet it appears that 90 per cent of all our genetic material doesn't do anything at all. It just sits there, like a lift attendant during power outage.

From this I believe we can draw four important conclusions, namely: 1) Even though your genes don't do much they can let you down in lots of embarrassing ways; 2) always post your letters first, then buy the toothpaste; 3) never promise a list of four things if you can't remember the fourth one, and 4).....!

Student Article

World's largest solar tree installed in West Bengal, India

- K. Aparna, Y17ME077

A solar tree is a structure where solar modules are planted on a single pillar, which looks like a tree trunk. It serves the dual purpose of being an artwork and an energy generator. The solar tree has been installed at the CSIR-CMERI Residential Colony, Durgapur. Each solar tree will cost ₹750,000. In all, there are 35 solar photovoltaic (PV) modules in each tree with a capacity of 330 W each. The tree is designed to ensure maximum sunlight exposure for each PV module while creating the least amount of shadow beneath. Dr. Harish Hirani, Director of CSIR-CMERI, stated that "The installed capacity of the solar tree is above 11.5 kW with an annual capacity to generate 12,000-14,000 kWh of clean power. The energy generated can be monitored either in real-time or daily." The inclination of the arms holding the PV modules are flexible and can be adjusted- a feature which is not available in rooftop solar systems. Dr. Hirani further explained, "The CSIR-CMERI developed solar tree, besides being the world's largest solar tree, also has certain customizable features for application at diverse sites. The solar trees were designed in a manner to ensure minimum shadow area, potentially making these solar trees available for widespread usage in agricultural activities such as high capacity pumps, e-tractors, and e-power tillers. "The solar trees can be aligned with agriculture for substituting price-volatile fossil fuels. Each solar tree has the potential to save 10-12 tons of carbon emissions when compared with fossil fuel, and the surplus power generated can be fed to the power grid. The solar tree has capabilities to adapt a bevy of Internet of Things (IOT)-based features, such as round-the-clock CCTV surveillance in agricultural fields, real-time humidity, wind speed, rainfall prediction, and soil analytics sensors. For developing a renewable energy-based grid, interested micro, small, and medium enterprises can align their business models with the Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan (PM KUSUM) program for farmers. The KUSUM program is expected to help Indian farmers by providing them financial and water security through the mobilization of solar projects and solar-powered water pumps. The program has been divided into three components and aims to add a solar capacity of 25,750 MW by 2022. The solar tree can also be connected to CSIR-CMERI's solar-powered e-suvidha kiosks for real-time access to the massive agricultural database, as well as to the eNAM (National Agricultural Marketplace) for instant and real-time access to a unified online market. Mercom had earlier reported that the Chhattisgarh State Renewable Energy Development Agency issued two tenders for the supply and installation of 5,000 small solar irrigation pumps and 700 solar trees in the state

Faculty Article

IMPACT OF COVID-19 ON ENGINEERS

Skills to build and career path to follow

- Smt. K. Lakshmi Chaitanya, Asst. Professor

Since the start of 2020, the world has been witnessing a health calamity with uncertain implications. The coronavirus pandemic of Covid-19 has wrought havoc, causing immense damage in terms of loss of human lives as well as financial and economic shortfalls. The world witnessed a massive change almost overnight. Countries were forced to impose lockdowns with widespread economic and financial disruptions. The students, I feel, are amongst those whose lives took an unalterable turn. The verdict is not yet out but the pangs of staying indoors is already playing havoc with the minds of the young generation. The school or college going community had to suddenly shift from in-class action to on-screen lectures and demonstrations. Those who were waiting for the entrance examinations to kick-start their careers, are still keeping their fingers crossed awaiting that moment when these hurdles would be over.

Impact of Covid-19 on technology sectors

The technology and engineering sectors have been hit extremely hard with the virus setting off inflationary trends in virtually every sector. Although, some sectors could be the worst affected, for some, it could be an exceptional growth opportunity. This changed scenario would also decide the choice of careers for engineers and technocrats in the days to come So, considering the job scenario, the question at this crucial moment for any engineering student, be it an aspiring one or those who are already in the middle of their degree, is what career path should one follow? This question could be split into two parts -- what sectors would flourish post-Covid and what skill sets would come in handy in tomorrow's world?

Growth factors after Covid-19

The students of today will have to be very much in sync with the technology trends which are emerging at this key moment in history. Although IT sector is still the biggest recruiter and would remain one post-Covid, the jobs coming in this sector would either reduce or be re-engineered to suit the changed set-up. Be it the education sector, the health-care industry, the manufacturing sector or the construction industry, automation with focus on Artificial Intelligence, Data Sciences, Machine Learning, and Internet of Things (IoT) are going to be the key drivers.

Industry 4.0 which has been the buzzword over the last few years, in fact, has been made possible due to the combination of cyber-physical systems, the IOT and Internet of Systems. The sectors which have already adopted or are adapting to digitizing their end-to-end workflow operations would be at the forefront of hiring. This industry requires engineers with high-end programming skills, not just in any one language but multiple programming languages.

The 'work from home 'concept would fuel the demand for IT hardware and software products. Globally the concept of the 'home office' is posing a challenge for technology and engineering service companies, especially those which are historically used to working on customer sites or in research labs. To virtualize the entire experience is a challenge that is staring engineers right in the face. This would require some effort as innovation needs controlled environments to achieve desirable research outcomes.

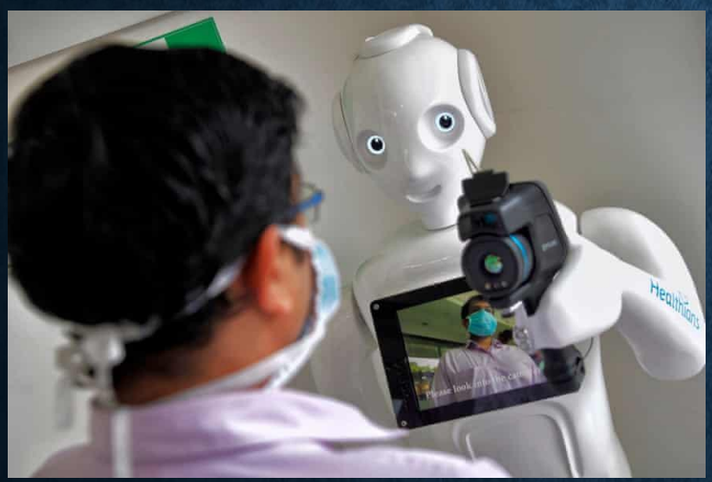
Which skillsets will be in demand?

As the industries look to overhaul their outlook, work-experience, and the mode and scope of hiring, the students at their end would have to be mentally focused and will need to upgrade their skills more frequently than ever before. Students' skill sets in addition to their respective technical know-how, must include effective communication (not just verbal but also written), aptitude and attitude. There would always be a demand for creative reasoning, design thinking and problem-solving skills. These skills would be more in demand looking at the current recruitment trends, all in a virtual mode. In a nutshell, the whole engineering fraternity, will have to let go of the traditional mindset and think out of the box to find innovative solutions to the way forward. As the dust settles down on this outbreak, the new dawn would bring in new challenges of survival and those, who adapt and adopts faster, will win the race

Robots are joining the fight against coronavirus in India

Stepping in where humans should not, robots are being used for jobs such as sanitizing hospitals and delivering food and medicines in many parts of the world and perhaps soon in India where experiments are underway to increase their role in combating COVID-19. As health workers, researchers and governments struggle to contain the spread of the pandemic that has infected more than 7,00,000 people globally and claimed more than 30,000 lives, robots are also being deployed for administering treatment and providing support to quarantined patients. The World Health Organisation has advised physical distancing for people around the world to prevent community level transmission of COVID-19.

In India, the country with the world's second-highest number of Covid-19 cases, a handful of hospitals has started to use robots to connect patients with their loved ones, and assist healthcare workers on the frontlines of the pandemic. Bangalore-based Invento Robotics has designed three robots to carry out tasks ranging from disinfecting surfaces to answering patient questions and enabling video consultations with doctors. Of the eight the company has so far deployed, the most popular model is Mitra, which means friend in Hindi and costs around $10,000. Using facial-recognition technology, the robot can recall the names and faces of patients it has interacted with. Mitra can roam around a hospital independently, helping patients connect with family and doctors via its cameras and a video screen attached to its chest.



"Mitra can be the nurse's or doctor's assistant, take readings and vitals, remind them of medications," says Balaji Viswanathan, CEO of Invento Robotics. He says the human-like robot engages with patients and gains their trust. "It may sound ironic but we are using robots to bring humanity to hospitals," he tells CNN Business. Yatharth Hospital in the city of Noida, northern India, has deployed two Mitra robots — one at its entrance to screen patients for coronavirus symptoms and the other in the intensive care unit. "Inside our ICU [Mitra] helps patients connect with their families through video stream and gives the patient's family a look inside," hospital director Kapil Tyagi tells CNN Business.

"Patients get happy and positive whenever the robot visits them. They are often clicking selfies with Mitra," he says. Viswanathan says Invento uses "best in class security" for video feeds between doctors, patients and their families. For in-depth telemedicine consultations, a booth is built around the robot to give patients privacy.

Quarantine 'nurses'

For Propeller Technologies, the nationwide lockdown turned out to be an opportunity to re-programme its inventory of 12 school-oriented robots into medical assistants in quarantine wards.

"We are experts in conveying technology in the easiest way to school students, with robots that help to bridge the gap between innovations and their real-time applications," says S Mohamed Aashik Rahman, CEO, Propeller Technologies. The voice-interactive Zafi robot was originally designed to act as an explainer for school subjects, and meant to be delivered to clients in Tamil Nadu, Kerala and Andhra Pradesh. When the lockdown barred long-distance travel, the engineering team decided to repurpose the robots for a medical scenario instead.

Student Article

Facts about chess

- T. Bhanu Teja, Y19ME127

- The number of possible unique chess games is much greater than the number of electrons in the universe. The number of electrons is estimated to be about 10^79, while the number of unique chess games is 10^120.
- The longest chess game theoretically possible is 5,949 moves.
- The longest time for a Castling move to take place was the match game between Bobotsor vs. Irkov in 1966: 46. 0-0.
- The word "Checkmate" in Chess comes from the Persian phrase "Shah Mat," which means "the King is dead."
- Blathy, Otto (1860-1939), credited for creating the longest Chess Problem, mate in 290 moves.
- The Police raided a Chess Tournament in Cleveland in 1973, arrested the Tournament director and confiscated the Chess sets on charges of allowing gambling (cash prizes to winners) and possession of gambling devices (the Chess sets).
- The number of possibilities of a Knight's tour is over 122 million.
- The longest official chess game lasted 269 moves (I. Nikolic – Arsovic, Belgrade 1989) and ended in a draw.
- From the starting position, there are eight different ways to Mate in two moves and 355 different ways to Mate in three moves.
- The new Pawn move, advancing two squares on its first move instead of one, was first introduced in Spain in 1280.
- Dr. Emanuel Lasker from Germany retained the World Chess Champion title for more time than any other player ever: 26 years and 337 days.
- In 1985, the Soviet player Garry Kasparov became the youngest World Chess Champion ever at the age of 22 years and 210 days.
- The first Chessboard with alternating light and dark squares appears in Europe in 1090.

Ministry of Electronics and Information Technology (MeitY) has banned 118 more Chinese apps including one of the most popular mobile games PUBG Mobile. The official press release stated that all of these apps have been "banned under section 69A of the Information Technology Act".PUBG Mobile is one of the most popular mobile games in India with millions of downloads and daily active users. The PUBG Mobile app is still available on Google Play store and Apple App store. The app is also working for users still now.

Faculty Article

SIX STROKE IC ENGINE

- D.Bharat Prasanna, Asst. Professor

The six-stroke engine is a advance version of internal combustion engine based on the four-stroke engine, but with additional two electric strokes intended to make it more efficient and reduce emissions. It uses fresh air for the second suction (clean air from atmosphere) the fifth stroke. It has a wide range of uses in Automobiles, heavy goods, construction-site and farm vehicles, Motor boats, motor-pumps, generator sets, stationary engines, etc. intended for agriculture and industry applications. Its a new method which is capable for mass producing these engines. This is done by altering an ordinary 4 valve 4 stroke petrol engine. The working of engine is as follows: - 1st: suction stroke, 2nd: compression stroke, 3rd: power stroke, 4th: exhaust stroke, 5th: 2nd suction stroke where fresh air is sucked, 6th: exhaust stroke. The main changes are in design of camshaft, sprocket, and rocker arm additional electric motor. The engine used is a Bajaj pulsar 135 ls engine. Six stroke engines have a very high relevance now a days. It helps Reduction in fuel consumption, Reduction in pollution, better performance and more extraction of work/cycle higher overall efficiency and ecofriendly.

The invention relates to six stroke engines conventionally four stroke engines are used in variety of automobile applications. The efficiency of the engine can be improved by making the crankshaft to rotate three times in one cycle. This can be achieved by adding two another electric power strokes. There are two kinds of system explained in this specification.

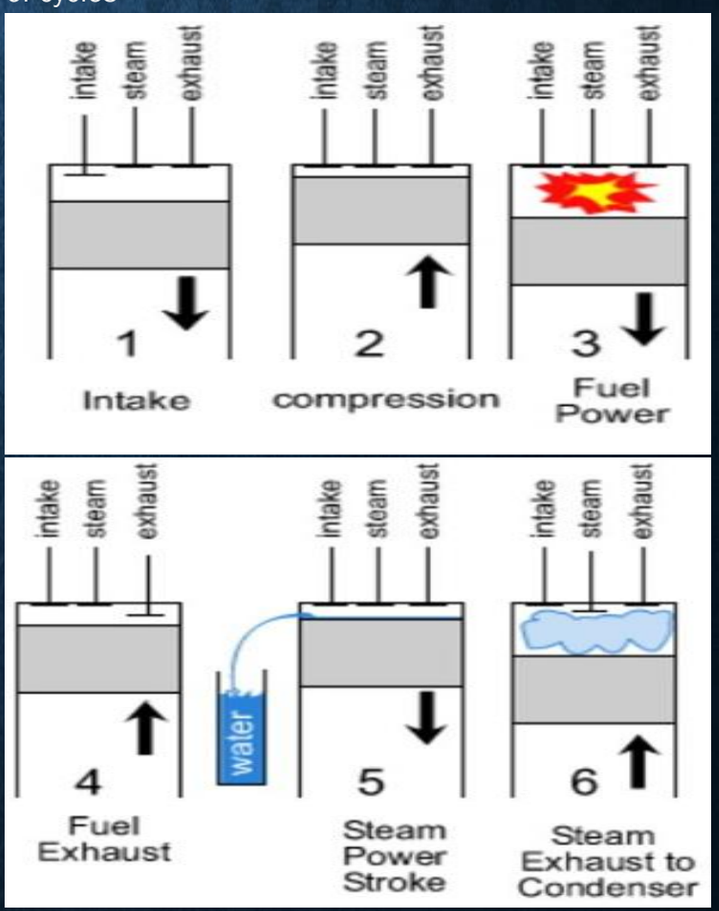
1. Six stroke 2 valve system
2. Six stroke 4 valve system.

NEED TO DEVOLOPE SIX STROKE ENGINE

The necessity to developed six stroke engine is to increase the efficiency of the internal combustion engine. The disadvantage of the four-stroke cycle is that only half as many power strokes are 2 completed per revolution of the crankshaft as in the two-stroke cycle and only half as much power would be expected from an engine of given size at a given operating speed. The four-stroke cycle, however, provides more positive scavenging and charging of the cylinders with less loss of fresh charge to the exhaust than the two-stroke cycle. However we want to developed the six stoke engine that can be free from the entire problem of two stroke four stroke engine.

PRINCIPLE OF SIX STROKE ENGINE

A six stroke engine describes a number of different approaches in the internal combustion engine to use electric Power an additional power and exhaust stroke of the piston. The six stroke engine has 2 power strokes, one fuel, one electric. The rapid electric power during the fifth stroke is similar to the combustion of the gasoline. the added strokes effectively reduce fuel consumption, and therefore emissions, without significantly compromising on power. Internal combustion engine has been modified with the goal of higher efficiency. It is increases the efficiency through the extra power by fifth electric stroke. The big advantages is that, we have got in six stroke engine, the electric power created the power in fifth stroke, and power has to be generated in the fifth stroke Due to electric power. The six stroke air is further used for different of applications making the engine lighter and giving 50% increased efficiency. The six stroke engine has consist of the six processes of cycles



career

Why GATE Exam is Important ?

The purpose of the GATE exam is to test students knowledge and understanding of their under Graduate level subjects in Engineering and Science. Every year lakhs of Engineering graduates pass out from universities and engineering colleges. GATE In the present competitive scenario, to measure and test the caliber of engineering students is possible through the GATE exam only. There is a misconception among students is that the GATE exam is only for ME. /M. Tech which finally leads to a teaching career only. But, it is not correct. The GATE score of the candidate is also used by several public sector undertakings (PSU) (i.e., government-owned companies like Indian Oil, GAIL, and Hindustan Petroleum etc.) for recruiting graduate engineers in entry-level positions, to get Fellowship Programs from CSIR and Scholarships in ME/M.Tech and many more.

- To pursue M.E./ M.Tech./ M.Sc programs in any of the leading institutes in the country
- Master's degree leads to specialization and cultivates and brings out best of your interest in a certain area which may lead to research / Ph.D.,
- More domain specific companies recruit through campus recruitment in leading Institutes.
- Higher salaries are offered for post graduate student when compared to a graduate
- Masters degree is a must for those wishing to apply for Faculty/Research positions in educational institutes and most of the R&D centers.
- Scholarship of Rs 8000/- is paid during masters course; so no dependency to parents for financial needs.
- GATE qualified candidates are also eligible for the award of Junior Research Fellowship in CSIR Laboratories and CSIR sponsored projects.
- More than 37 PSUs (Public Sector Undertakings-government organizations), like BARC, IOCL etc. prescribe GATE qualification as a requirement.
- Based on the GATE score, some of the foreign university (Like NTU, Singapore) offers Ph.D. position without any GRE score.
- Most importantly to get to be a part of any nationally reputed Educational Institute and enjoy learning and research in the conducive ambience.
- One gets intellectual satisfaction of working in the area of interest.
- Last but not the least, Master course changes the individual's thought process; teaches us how to approach and solve a problem in the totally new & unknown environment.

GATE 2021

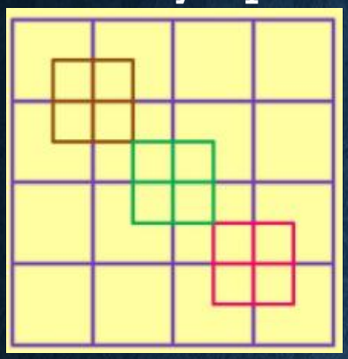
GRADUATE APTITUDE TEST IN ENGINEERING

Organising Institute
Indian Institute of Technology Bombay

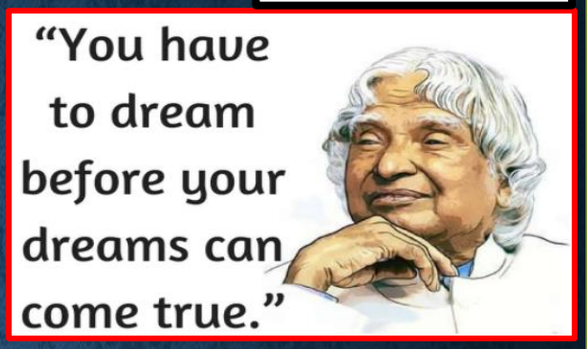
GATE 2021 Events	GATE 2021 Dates
Admit card download	8-Jan-2021
Miscellaneous Activities	5-Feb-2021 12-Feb-2021
Exam day	6-Feb-2021 to 7-Feb-2021 and 13-Feb-2021 to 14-Feb-2021
Result announcement	22-Mar-2021
Application form availability	11-Sep-2020
Last date to fill the application form	7-Oct-2020
Last date to register with late fee	12-Oct-2020
Application form correction window	17-Nov-2020 to 23-Nov-2020

For more details: https://gate.iitb.ac.in

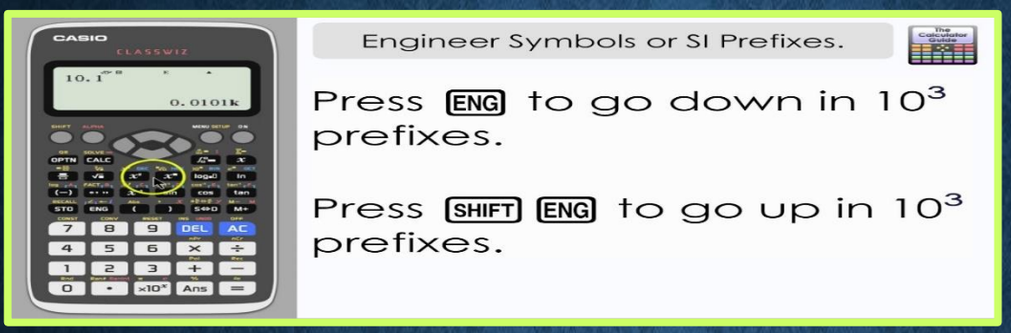
How many squares ?

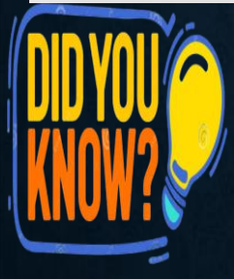


Fun Zone



Trending app in 2020





- 220 million tons of old computers and other technological hardware are trashed in the United States each year.
- A diamond will not dissolve in acid. The only thing that can destroy it is intense heat.
- According to Moore's Law, microchips double in power every 18 to 24 months.
- Albert Einstein won the Nobel Prize for physics in 1921.

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