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interview

SANJAY G DHANDE

'There will be a shortfall of 2.5 million employable engineers by 2020'

Gauri Kohli
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Professor Sanjay G Dhande, former director of IIT Kanpur, founder of the Indian Institute of Information Technology, Jabalpur, and the Indian Institute of Technology, Rajasthan, talks about the engineering education scenario today. A member of the Scientific Advisory Council to the prime minister, he is also part of the National Innovation Council. He is also the founder director of Hyderabad-based Mahindra École Centrale, an autonomous private engineering institution that will start its first session in August 2014.

How do you see engineering education today?

Out of 160 million youth in the country, about 40 to 50 million are college-goers. This number is likely to double in the next few years. According to NCAER (National Council of Applied Economic Research), there will be a shortfall of approximately 2.5 million employable engineers by 2020. We need to focus on quality mechanism as in the current scenario only a few institutions are in that elite bracket. Engineering education has to be more international and based on hands-on learning. Manufacturing jobs have fallen to 15% and those in the service sector have grown to 60%. So the private sector and the academia have a major role to play in building a quality education system and ensuring employability.

What changes would you like to see in engineering education?

Emphasis should be given to humanities and the social sciences as engineering is not purely a technical field. It requires students to be well-versed with other subjects. Having good industry-driven research programmes based on a pull model will help.

Is there something that needs to be done to boost the IIT system?

All engineering institutions, including the IITs, must work on tie-ups with foreign universities. There needs to be better coordination between the IITs, the NITs and other technical institutions so that they can transfer credits and even allow students in one institute to take up certain courses at the others. An ideal BTech degree should be a combination of all engineering disciplines and I may propose this to the University Grants Commission in the future. The IITs need to think beyond the JEE. The old IITs must emphasise more on postgraduate education and the new one must focus on 21st century education.

Tell us about Mahindra École Centrale.

The engineering institution has been established through a collaboration involving Mahindra Group, École Centrale Paris, a French engineering university, and the Jawaharlal Nehru Technological University, Hyderabad. It is based on the Anglo Saxon model of education.

The institution will promote research in energy, environment, and so on, and also ficus on social sciences and humanities. Students must qualify the JEE (Main) and have 60% aggregate marks in the Board exams to qualify. Admissions will begin in July 2014. The academic programme will begin post the AICTE approvals and it willl also work towards approval of an international accreditation organisation such as CTI (Commission des Titres d'Ingénieur, an independent body involved in the development of the European Higher Education Area, established by France).

Enter the engineering arena

TEST OF SPEED To be held on April 6 in the offline mode and between April 9 and 19 (online), the JEE (Main) is likely to be more competitive than last year, predict experts

engineering special

JOINT ENTRANCE EXAM

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The biggest entrance exam of the year is now just a few days away. The JEE (Main) offline will be held on April 6, 2014, and the online edition between April 9 and 19, 2014. Approximately 14 lakh students are expected to appear for the JEE (Main) 2014 and only 1.5 lakh students from all categories would qualify for the JEE (Advanced). Those who are in the top 20 percentile of their respective Class 12 boards and clear the JEE (Advanced), will also make it to the final merit list of the IITs.

The rest will be cleared for undergraduate engineering programmes at the NITs, IIITs, other centrally-funded technical institutions, and institutions funded by participating state governments. All aspirants can choose between JEE (Main) Paper 1 (BE/BTech) and JEE (Main) Paper 2 (BArch/BPlanning) or both.

JEE 2013 VS JEE 2014

About 25% questions in the paper are easy, 50% are average and 25% are difficult. The cut-off for JEE (Main) is generally around 60% for NITs & IIITs. The 40% marks from class 12 are crucial because they don't contribute to merit but determine whether or not you will be selected.

Anshika Rathee, a mechanical engineer with Maruti Suzuki India Ltd, says engineering education in the country is very competitive and rigorous but offers a lot of career choices

Comparing the previous editions of the paper, RL Trikha, director, FIITJEE, says, "In JEE (Main) 2013, chemistry was difficult as compared to JEE (Main) 2012 and mathematics was relatively simple. Last year, the cut-off was 36%, which means that a candidate who scored 36% also qualified. But this year, the cut-off percentage is likely to go up to 55% and even higher for the NITs at 60%. Also, in 2013, 36% questions were easy, 54% moderate and 10% were difficult. This year, this trend might continue but more marks are likely to be allotted to concept-based questions."

GEAR UP

"Knowing the topics alone is not important; putting what you have learnt to good use matters the most. So, speed and accuracy become vital and that can be achieved only through practice," says Anand Kumar, founder, Super 30. According to Kumar, in JEE (Main), questions are easier as compared to JEE (Advanced). But the former can be more competitive because it has more number of questions than the second stage of the JEE. JEE (Main) comprises 90 questions. "Go in for serious revision of old questions papers which have single-choice questions. You can even look at questions in papers that are 20 to 25 years old in all the three subjects," says Kumar.

SEE PAGE 02 FOR RELATED STORIES

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Is JEE the most competitive entrance exam? Post your comments on facebook.com/htedu

Forging ahead in the world of automobiles

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ENGINEERING EDUCATION EXPOSES YOU TO THE INDUSTRY. YOU CAN GO IN FOR MANAGEMENT OR START YOUR BUSINESS

ANSHIKA RATHEE, mechanical engineer with Maruti Suzuki India Ltd

Right from her school days, Anshika Rathee had a keen interest in repairing gadgets at home. "I used to check out how a mechanical device, gadget or appliance worked. That got me interested in engineering," says Rathee, who is now a mechanical engineer with the Maruti Centre for Excellence (MACE), a division of Maruti Suzuki India Ltd (MSIL), Gurgaon.

It was her 'drive for logic and efforts to implement her learnings' that helped Rathee succeed in a competitive discipline like mechanical engineering. "Engineering education exposes you to the industry. I learnt how parts/components are manufactured and assembled. You get a bigger platform and can even go in for management or start your own business. No other field gives you so many choices," says this alumna of Indira Gandhi Delhi Technical University for Women, who is a BTech in mechanical and automation engineering.

"Life in an engineering college was a treat. There were challenges, too. Engineering colleges in our country have a very rigorous curriculum. For students fresh out of school, there is a lot of pressure with so many exams, because of the semester system. So, in a period of four to five months, students have to write theory exams thrice and appear for practical examinations too. I did a lot of projects as well, and represented my college in national-level events. I was involved with the SAE IGIT Collegiate Club and promoted and encouraged my college mates to participate in the various competitions organised

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frompageone

Forging ahead in the world of automobiles

by SAE (Society of Automotive Engineers). I represented my college in 2011 and 2012 twice in the national event, SAE NIS Efficyle, and set up teams of eight students for both the years. Efficycle is a hybrid vehicle which promotes eco-friendly concepts. I was the only girl racing, riding my Efficyle competing with the rest of the boys in the endurance run," she says.

It required only enthusiasm and perseverance for a team of eight girls to build a vehicle, going to the auto markets in Mayapuri, Chawri Bazaar, Jhandewalan to source parts. "We designed and made the vehicle ourselves. I was the only girl racing, riding my Efficycle competing with the rest of the boys in the endurance run. College gave me a good learning environment and also gave me the opportunity to explore and get hands on experience of many engineering practices," adds Rathee.

College provided many extra curriculum opportunities as well. Rathee got a chance to groom herself in public speaking with debates, and much more.

Manufacturing or mechanical engineering is a branch which gives one exposure to production of components, items etc. "I opted for mechanical and automation engineering because of the physics I had studied. There was scope to learn more about many mechanical processes we use in daily life and in industry. Moreover, I wanted to get exposed to the automobile industry. It served as a perfect package for me. I wanted to find out how engineering comes into play in automobiles," says Rathee, who finds it a lively and dynamic field.

Working with MACE since July 2013, Rathee looks after quality and cultural upgradation of Tier 1 and Tier 2 suppliers of MSIL. "We mentor and consult our suppliers with the Maruti Production System and take up projects related to improving productivity, operating equipment efficiency, and more in their companies," she says.

At Maruti, they also have a function of vendor system audit, training and development. "I go for regular shopfloor visits at various suppliers of MSIL and study their processes in detail. The learning and exposure one gets is incomparable. It is a rare opportunity to get such a wide exposure to so many processes, organisations, systems and culture of many organisations just at the start of my career," she adds. The young engineer also holds training sessions for vendors, to help them out in the tough areas.

Talking about some challenges she faces, Rathee says: "Physical stamina is required at the shopfloor, one gets a lot of practical exposure that's necessary for learning, and upgradation. It takes you to the core of engineering practices."

Seminar on yoga, Ayurveda at IIT-K

TNN | Mar 25, 2014, 02.33PM IST

KANPUR: IIT-Kanpur will organise a seminar on yoga and Ayurveda on March 30. An expert said that a healthy mind is also needed for overall development and the ancient texts of India have centered on this holistic aspect of health. Through improvement of diet, thought and behaviour, most of the mental and physical ailments could be cured. When modern medical treatment is growing more and more costly, indigenous systems like yoga and Ayurveda could be a viable option. These are both cost efficient and effective, he said. To bring about harmonization among the body, mind and emotion, there will be discussion on yoga, homeopathy, Ayurveda, allopathy and naturopathy.

Publication: The Times Of India Delhi;Date: Mar 26, 2014;Section: Front Page;Page: 1;

DU likely to limit applicants to 10 colleges

Manash Pratim Gohain | TNN

New Delhi: Students seeking admission in Delhi University this year may have to restrict their applications to 10 colleges and six courses. They may not be permitted to change colleges more than once either.

These are some of the proposals the university is likely to implement in a bid to limit the chaos that prevailed during admissions in previous years. The DU administration has also said it would not allow colleges to enrol students beyond sanctioned strength.

▶Best of three, P 7

The changes were proposed by a committee set up last year to improve the admission process. According to a member, the committee has also recommended that students coming in from other streams have a 2% higher cutoff.

Last year, aspirants could take admission in any college provided their scores were higher than the cutoff.

"The proposed changes will be considered by the university administration soon. Although the online and offline centralized application process will stay, the proposal is to limit the number of applications and change in colleges. These will shorten the admission process," said a south Delhi college principal, who was in the committee.

Publication: The Times Of India Delhi;Date: Mar 26, 2014;Section: International;Page: 23;

Einstein's theory key to secure internet?

Melbourne: Physicist Albert Einstein's skepticism about quantum mechanics may lead to ultra-secure internet, according to a new study. Researchers from Swinburne University of Technology in Australia and Peking University in China said Einstein's reservations about quantum mechanics were highlighted in a phenomenon known as 'spooky' action at a distance. The theory is the strange way entangled particles stay connected even when separated by large distances.

"Until now the real application of this has been for messages being shared between two people securely without interception, regardless of the spatial separation between them," said associate professor Margaret Reid from Swinburne's Centre for Quantum and Optical Science. "In this paper, we give theoretical proof that such messages can be shared between more than two people and may provide unprecedented security for a future quantum internet," Reid said. AGENCIES

Business Standard

Delhi IIT based startup launches haemoglobin measurement device

IANS | New Delhi March 25, 2014 Last Updated at 15:54 IST

Medtech startup Wrig Nanosystems Tuesday launched a first of its kind ultra-convenient haemoglobin measurement device, TrueHb Hemometer, to help eradicate anaemia in the country.

The hemometer is compact, ultra-convenient and a portable device with 99 percent accuracy which has been validated at All India Institute of Medical Science (AIIMS). It is rechargeable and has high precision at a low price.

"Currently, the availability and proximity of blood testing facilities is a challenge, globally. Through our innovations, we intend to empower first point-of-care with miniaturized pocket sized blood testing devices based on bioelectronics disruptive technologies," said Ambar Srivastava, founder and managing director of the startup at the Technical Business Incubator Unit of IIT Delhi.

The device is first of its kind in India and is truly multi-disciplinary. It has been developed after extensive research in biochemistry, micro-optics, embedded electronics, computational algorithms and automated mass production machine designing.

"We are aspiring to revolutionize the global healthcare paradigm through disruptive innovations," Srivastava added.

Wrig Nanosystems is now building an all-in-one compact device, targeted to tap over 70 percent of pathology lab traffic at the first point-of-care. Such a device can speed up the blood testing investigation process, store EMR data and make healthcare smarter. Such a device will also empower far flung rural areas with reasonable medical services.

Wrig is strategically targeting to tap the $200 billion clinical pathology market through innovation and rapid commercial expansion.

Times of India ND 26-Mar-14 P-23

Air pollution biggest health risk, says WHO

Killed 7M In 2012; 80% Of Deaths Tied To Heart Diseases

Kounteya Sinha | TNN

London: Air pollution has emerged as the world's single largest environmental health risk, having caused seven million deaths in 2012 —80% of which were from heart attacks and stroke.

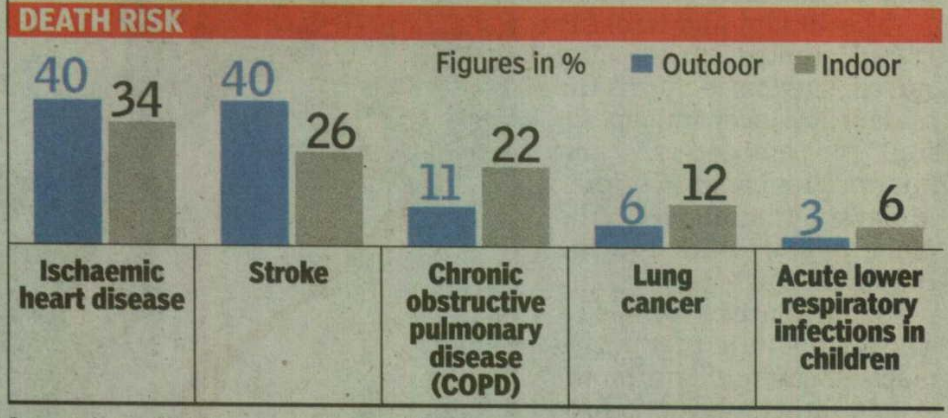
The WHO announced on Tuesday that 1 in 8 global deaths were linked with air pollution. It recently categorized outdoor air pollution — caused by car exhausts, power stations, emissions from agriculture and industry as well as heating in people's homes — as a Group 1 carcinogenic, a cancer causing agent in the same category as tobacco smoke, UV radiation and plutonium. World Health Organization's International Agency for Research on Cancer (IARC) said there was "sufficient evidence of carcinogenicity in humans".

Six per cent of these deaths were due to lung cancer caused by both outdoor and indoor air pollution. This is the first time that WHO has directly suggested a link between air pollution and heart disease, respiratory problems and cancer. This finding more than doubles previous estimates of deaths caused by air pollution.

Regionally, low- and middle-income countries in the WHO South-East Asia and Western Pacific Regions had the largest air pollution-related burden in 2012, with a total of 3.3 million deaths linked to indoor air pollution and 2.6 million deaths related to outdoor air pollution. "Cleaning up the air we breathe prevents non communicable diseases as well as reduces disease risks among women and vulnerable groups, including children and the elderly," says Dr Flavia Bustreo, WHO assistant director-general family, women and children's health. "Poor women and children pay a heavy price from indoor air pollution since they spend more time at home breathing in smoke and soot from leaky coal and wood cook stoves." After analysing the risk factors, WHO estimated that indoor air pollution was linked to 4.3 million deaths in 2012 in households cooking over coal, wood and biomass stoves. The new estimate is explained by better information about pollution exposures among the estimated 2.9 billion people living in homes using wood, coal or dung as their primary cooking fuel, as well as evidence about air pollution's role in the development of cardiovascular and respiratory diseases, and cancers.

GASPING FOR BREATH

According to a WHO report, **ONE IN EIGHT** deaths worldwide is caused due to air pollution and it has become the single biggest environmental health risk



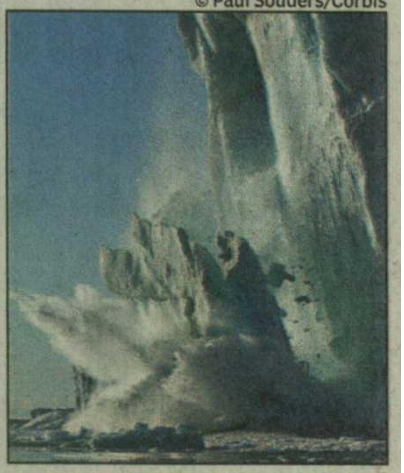
13 of 14 warmest yrs were in this century: Report

Vishwa Mohan | TNN

New Delhi: Just a week ahead of the release of a crucial report of a UN panel on impact of climate change on food, water and other resources, the World Meteorological Organization has set the tone. Sounding a note of caution, it said that "13 of the 14 warmest years" in recorded history fell in the current century.

The WMO, which made its findings public in its annual climate report in Geneva on Monday, also said 2013 was the sixth warmest year (tied with 2007) on record, indicating a long-term global warming trend. "Each of the last three decades has been warmer than the previous one, culminating with 2001-10 as the warmest decade on record," it said debunking the skeptics' theory of a 'pause' in global warming.

The findings show that effects of climate change are being felt everywhere — as reflected in many extreme weather events of 2013 ranging from Typhoon Haiyan in the Philipines, record hot Australian summer and heavy Monsoon rains and floods (like Uttarakhand disaster) and cyclone Phailin (in Odisha) in India.



WEATHER WOES

The climate report assumes significance at the time when the UN's Intergovernmental Panel on Climate Change (IPCC) is expected to predict many similar extreme weather events across the globe including one on the Himalayan glaciers. Unlike the 2007 report which wrongly projected that all Himalayan ice might melt by 2035, a leaked draft report of the panel mentioned that the IPCC would probably project that the Himalayan ice may "range from a 2% gain to a 29% loss by 2035" affecting the available fresh-water resources in India and China or affecting weather in this part of the globe.

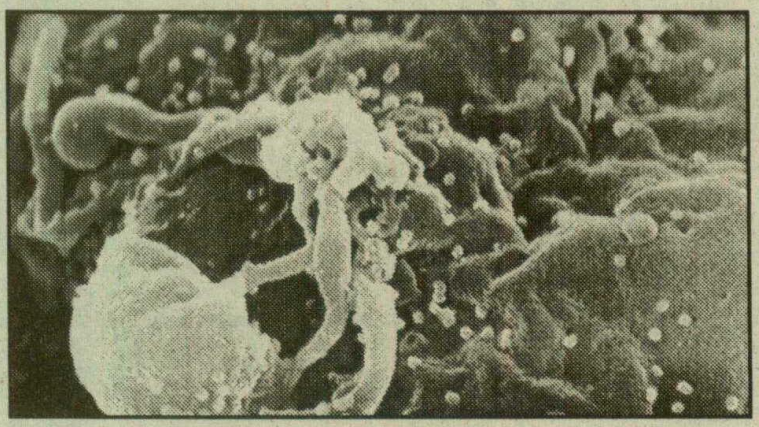
For the full report, log on to www.timesofindia.com

Statesman ND 26-Mar-14 P-15

CURE POSSIBLE IN FIVE YEARS

HIV, hep C with DNA vaccine found

PRESS TRUST OF INDIA
Melbourne, 25 March



Australian researchers have claimed to have made a significant breakthrough in tackling HIV and hepatitis C, using a new type of DNA vaccine which protects against the viruses and could possibly provide a cure in five years, according to a media report today.

Eric Gowans of the Adelaide University said the vaccine has already seen positive results in animals, with human trials to start next year, an ABC report said.

"DNA vaccines in general have enormous potential, but have not worked very well in large animals and in patients," Gowans said.

"They work very nicely in mice and we have developed a protocol and a technique that simplifies the whole process and makes a DNA vaccine very much more effective in large animals," he said, and added that he has found a way to stimulate the body's immune system response which helps deliver the vaccine.

DNA vaccines usually target muscles, but his technique injects DNA into the skin, he said.

"Because we want to improve the efficacy of the DNA vaccination, we target the skin because the skin has a much greater proportion of white blood cells, which are important for the kind of immunity that we are trying to impart," he said.

Those white blood cells are known as dendritic cells and play a key role during infection and vaccination.

The DNA vaccine stimulates the body's immune response and combines with the white blood cells to kill HIV or hepatitis C cells.

"What we need to do is to target that small population of white blood cells, which circulate generally in the body, and unless the vaccine targets those cells, the vaccine isn't effective and isn't efficient in any way," Gowans said.

"So we've developed a strategy that targets these white blood cells in an indirect manner; we generate a little inflammation and that attracts all these white blood cells to that site of vaccination" he said.

Gowans said other researchers have used skin to deliver the vaccine, but not to target white blood cells in this way.

"We kill the cells that the vaccine is targeted to, and then those dead cells are highly inflammatory and they attract more of these white blood cells, so that is the difference," he said.

While the vaccine is currently designed to treat patients who already have hepatitis C, Gowans said, it is likely, it could be used as a preventative vaccine for hepatitis C and HIV in the next five years.

Pioneer ND 26-Mar-14 P-13

Cognizance 2014

Cognizance, an annual technical fest of Indian Institute of Technology (IIT) Roorkee, held recently at their campus, gave science and tech enthusiasts a chance to look at some of the next generation innovations happening around the world. Themed on 'Imagineering Change', there were over 20,000 participants from all over the world in over 180 on campus and online events in a span of three power packed days. The festival highlighted the educational, cultural and financial impact of science and technology in our country and featured interactive demonstrations, hands-on activities and dynamic speakers to engage students and faculty. Embodied by the spirit of innovation, each event was exclusively molded to captivate people of all ages in science and showed off the ways technology can be fun. Over 12 eminent speakers from across the world spoke about evolutionary innovations.