

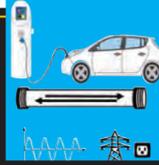


# THE TIMES OF INDIA

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**TODAY'S EDITION**

► Decoding the mechanism behind DC and AC  
► Students share their school project  
**PAGE 2**



► Words you should never say in front of kids  
**PAGE 3**



► 5 takeaways from the India-Australia ODI series  
**PAGE 4**



**STUDENT EDITION**

FRIDAY, DECEMBER 4, 2020



**WEB EDITION**

**CLICK HERE: PAGE 1 AND 2**

## INDIA TO LAUNCH SHUKRAYAAN VENUS MISSION IN 2024

### INDIA'S RENDEZVOUS WITH VENUS



If reports are to go by, India will now be launching its orbiter to Venus in 2024, a year later than planned. Named the Shukrayaan, the orbiter will be the first mission to Venus by the Indian Space Research Organisation (ISRO), which will study the planet for four years.

► ISRO has short-listed 20 space-based experiment proposals, including few from France, for the mission.

► According to ISRO, the scientific objectives of the Venus mission include investigation of the surface processes and shallow sub-surface stratigraphy; solar wind interaction with Venusian ionosphere, and study-

ing the structure, composition and dynamics of the atmosphere

► The payload capability of the proposed 2,500-kg satellite, planned to be launched onboard GSLV Mk II rocket, is likely to be 175 kg with 500W of power

► The proposed orbit is expected to be around 500 x 60,000 km around Venus

#### WHY VENUS?

► Venus is often described as the "twin sister" of the Earth because of the similarities in size, mass, density, bulk composition and gravity

► It is believed that both the planets share a common origin—formed at the same time out of a condensing nebulosity, around 4.5 billion years ago

► Venus is around 30 per cent closer to the sun as compared to the Earth, resulting in much higher solar flux

Mariner 2 was the first successful mission not only to Venus, but to any other planet. It made a flyby of Venus on Dec 14, 1962. The NASA spacecraft recorded Venus' temperature for the first time, which stated that it has a surface temperature of roughly 480 degrees Celsius. The spacecraft also detected the density, composition and variation of the solar wind

#### 5 WEIRD FACTS ABOUT VENUS

1 There are more volcanoes on Venus than on any other planet in the solar system

2 As the bulk of its atmosphere is made of CO<sub>2</sub>, an extreme greenhouse effect is warming its surface

3 While Venus is not the largest planet of the solar system, its proximity to the Earth makes it the brightest of all the planets

4 The ancient Babylonians tracked its wanderings through the sky in records that date as far back as 1600 BC. Greek mathematician Pythagoras was the first to discover that the brightest stars in the morning and evening sky were in fact the same object, Venus

5 Venus has phases like the Moon. When Venus is on the opposite side of the sun, it is in full phase; while it appears in a new phase, when it is between the Earth and the sun. In 1610, Italian astronomer Galileo Galilei became the first person to witness these phases



### Spotlight

#### CBSSE BOARD EXAM 2021 TO BE HELD IN WRITTEN MODE ONLY, NOT ONLINE

The Central Board of Secondary Education (CBSE) has announced that the annual board examination for students of class X and XII will take place in pen and paper mode and not online. The CBSE Board has also said that students who are not able to appear for the practicals, alternatives will be explored.



The Union education ministry will be holding consultation with the teachers, students and parents on December 10 regarding the exams. Education minister Ramesh Pokhriyal Nishank had tweeted and asked the stakeholders to share their concerns

#### TECH BUZZ

#### WHATSAPP NOW ALLOWS USERS TO SET CUSTOM WALLPAPERS, USE STICKERS FOR EACH CONTACT

WhatsApp now allows its users to set custom wallpapers, use stickers for each contact. The messaging service has also updated its existing features by adding a selection of new wallpapers and stickers.

► In the latest update, it has also made it possible for the users to customise chats for different groups and individuals ► The latter features let users choose a specific wallpaper for each chat window, or individual contact, enabling them to set the mood for a conversation, as opposed to having a uniform background for all the conversations

► The recent update, available to the users of the Facebook-owned chat app, allows new colours to be added to default 'doodle' wallpapers. It has also introduced 'new, diverse and iconic images of nature and architecture' from different parts of the world to appeal better to geographically-disparate user base

► For fans of stickers, WhatsApp has made it easier to find by enabling search with text or emoji in the browse category

► The company has also introduced a new animated version of the popular World Health Organisation (WHO) 'Together at Home' sticker pack



#### LAHORE AGAIN TOPS LIST OF WORLD'S MOST-POLLUTED CITIES

Laure has again topped the list of the most-polluted cities in the world, according to the air pollution data released by the US Air Quality Index. According to the index, Lahore reported a particulate matter (PM) rating of 423. Lahore's AQI fell in the range of 301 and higher, which has been classified as 'hazardous.'

► Lahore is not the only Pakistani city to feature in the top 10 list for the worst air quality. Pakistan's largest city of Karachi is ranked seven on the AQI  
► New Delhi ranked second with a PM of 229, while Kathmandu was the third-worst city with a PM of 178

#### NEWS IN BRIEF

##### ENVIRONMENT



Photo: AFP

Photo: Reuters

#### SINGAPORE FIRST COUNTRY TO APPROVE SALE OF LAB-GROWN MEAT

Lab-grown chicken will soon be available in restaurants for the first time after winning the green light from Singapore regulators. US start-up Eat Just said that its meat, created from animal cells and produced in bioreactors, had been approved for sale in the city-state as an ingredient in chicken bites.

Meat consumption is projected to increase over 70 per cent by 2050, according to Eat Just. However, experts have frequently warned that it is a key driver of climate change



Share your views at [toinie175@gmail.com](mailto:toinie175@gmail.com). You can post your comments at [toistudent.com](http://toistudent.com)

#### Quote unquote

To beat Covid-19, we also need to defeat the parallel pandemic of mistrust that has consistently hindered our collective response to this disease, and that could undermine our shared ability to vaccinate against it. Governments and institutions have to build trust in the communities, where misinformation has taken root. Surprising as it may seem, there are still communities around the world that are not aware of the pandemic. Such communities are typically vulnerable and marginalised, living outside the reach of typical communication channels. We believe that the massive coordinated effort that will be needed to roll out the Covid vaccine in an equitable manner, needs to be paralleled by equally-massive efforts to proactively build and protect trust

FRANCESCO ROCCA, president, Int'l Federation of Red Cross, on fake news relating to Covid-19 vaccine



#### NEWS IN CLUES

#### Which world leader wrote the book 'The Perils of Pushy Parents'?

**CLUE 1:** The 56-year-old was born in New York, US  
**CLUE 2:** His original first name is 'Alexander'  
**CLUE 3:** As mayor of London, he oversaw the 2012 Summer Olympics

**ANSWER: BORIS JOHNSON.** The UK PM has been invited as the chief guest for the Republic Day celebrations in 2021. According to reports, PM Narendra Modi formally invited Johnson during a telephonic conversation on November 27. The last British PM at the Republic Day parade was John Major in 1993.

#### OSCARs 2021 will not be a virtual affair

There were a lot of speculations around how the Oscars would be held amid the Covid pandemic, and it is now confirmed **ENTERTAINMENT** the award gala will not go virtual. "The Oscars in-person telecast will happen," a representative from the Academy told variety.com.

- The 2021 Oscars will take place on April 25
- The shortlist for next year's Academy Awards will be unveiled on Feb 9, and the nominations will be announced on Mar 15
- The number of people to be allowed inside the Dolby Theatre, with a seating capacity of 3,400, has not been disclosed as of now



#### 'RAMAYAN CRUISE SERVICE' ON SARYU RIVER IN AYODHYA SOON



In another push to tourism at the birth place of Lord Rama in Ayodhya, the Union government will launch a 'Ramayan Cruise Tour' on the Saryu river in the holy city soon. The cruise will be equipped with all the luxury comforts and facilities along with essential safety and security features at par with the global standards. The interiors of the cruise and the boarding point will be based on the theme of Ramcharitmanas. The fully air-conditioned 80-seater cruise will have large glass windows for experiencing the scenic beauty of the ghats. The cruise will be equipped with kitchen and pantry facilities for the comfort of the tourists. The entire tour will cover an approximate distance of 15-16 km. The tour will conclude with Saryu Aarti, in which every member will be able to participate.

#### 2020 TAUGHT ME THE IMPORTANCE OF DOING NOTHING AT TIMES: SHILPA

Actress Shilpa Shetty says 2020 has taught her a lot, and most importantly made her realise the importance of doing nothing. "In 2020, I learnt that while it's important to be productively busy, it's equally important at times to do nothing," Shilpa wrote on her Instagram handle, along with an image of herself doing yoga.

**CELEB TALK**

#### SHILPA'S MANTRA

- "Sit in silence, feel the breeze, observe your surroundings, listen to the trees moving, and just focus on the mundane things that you'd miss noticing otherwise. Please yourself... and Just be yourself!"
- Choose "positivity, happiness, love, calm, belief. Refuse: negativity, hate, anger, drama, chaos, pleasing others"



#### FACTOID 235 MILLION

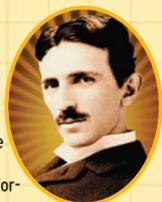
That's the number of people, who will need humanitarian assistance next year—nearly a 40 per cent increase in 2020, courtesy, Covid-19', according to the UN. The global health crisis has resulted in people reeling from conflict, levels of displacement and climate change shocks. According to the UN, while richer countries have invested large amounts in staving off economic disaster from the Covid-induced slump and could now see light at the end of the tunnel, the situation in relatively poor countries remains precarious. Climate change and rising global temperatures have further contributed to the bleak outlook for humanitarian needs in 2021

## ALTERNATING CURRENT

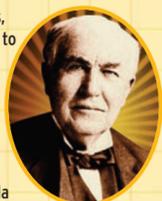
K Srinivasa Rao,  
Physics Teacher, The Future  
Kids School, Rajahmundry

## WAR OF CURRENTS

The battle of alternating current (AC) and direct current (DC) between Nicole Tesla and Thomas Edison took place in the late 1890s. Nicole Tesla developed AC and Thomas Edison developed DC. The battle between these two great inventors to prove their inventions superior to the other was later termed as War of the Currents. Thomas Edison spread misinformation saying that alternating current was more dangerous, even going so far as to publicly electrocute stray animals using AC to prove his point. In order to counter attack the false propaganda made by Edison, Tesla decided to prove alternating current is safe and secure. Therefore, he designed Tesla Coil and made 1,00,000 volts of electricity to flow through his body. With that, people believed in Tesla inventions and started believing alternate current. With the growth of alternating current system, the Edison companies incurred huge losses and later he lost his shares in the Edison companies and was parted from them. He later came to regret that he had not listened to Tesla and used alternating current.



Nicole Tesla

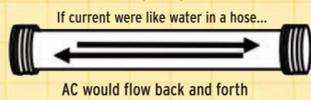


Thomas Edison

## LET US UNDERSTAND AC AND DC IN A SIMPLER WAY:

## ALTERNATING CURRENT (AC):

It is a current that changes its magnitude and polarity at regular intervals of time. It can also be defined as an electrical current, which repeatedly changes or reverses its direction. In simple words it starts, say, from zero, grows to a maximum, decreases to zero, reverses, reaches a maximum in the opposite direction, returns again to the original value, and repeats this cycle indefinitely.



AC would flow back and forth



## REAL LIFE APPLICATIONS OF AC:

AC powers almost every household in the world and it is the more popular current when it comes to operate devices like electric motors, refrigerators, mixers, grinders, toasters etc.



## DIRECT CURRENT

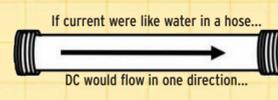


## ADVANTAGES OF AC OVER DC:

- AC is less expensive and easy to generate than DC.
- The distance covered by AC is more than that of the DC.
- The power loss during transmission in AC is less when compared to DC.

## DIRECT CURRENT (DC):

It is a current that flows only in one direction and the direction of flow of current remains constant. Batteries provide DC, which is generated from a chemical reaction inside the battery.

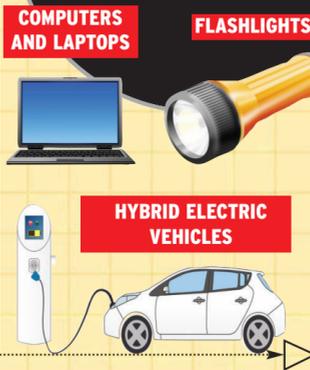


DC would flow in one direction...



## REAL LIFE APPLICATIONS OF DC:

DC is popular in applications that contain batteries or a USB cable to charge. Computers, LEDs, flashlights, cell phones, solar cells and electric vehicles all run on DC power.



## DIFFERENCES BETWEEN AC AND DC:

| ALTERNATING CURRENT   | DIRECT CURRENT  |
|---|---|
| AC is safe to transfer longer distance even between two cities, and maintains electric power. | DC cannot travel for a very long distance. It loses electric power. |
| The rotating magnets cause the change in the direction of electric flow.                      | The steady magnetism makes DC flow in a single direction.           |
| In AC, the flow of current changes its direction backwards periodically.                      | It flows in a single direction steadily.                            |
| Electrons in AC keep changing its directions - backward and forward.                          | Electrons only move in one direction - that is, forward.            |

## QUIZ

## THE MYSTERY OF CHEMISTRY!!

Sanghamitra Basu Sengupta, teacher, Avishkar Academy, Bengaluru

Q1 What chemical does an onion produce on being cut, that makes us cry?

- Picric acid
- Sulphuric acid
- S-propanethial -S-oxide
- Ethyl mercaptan



Q2 Who won the Nobel Prize in Chemistry twice?

- Madame Curie
- Linus Pauling
- Roald Hoffman
- Frederick Sanger

Q3 Which chemical was used to preserve eggs in olden days?

- Sodium oxide
- Sodium hypochlorite
- Sodium ethoxide
- Sodium silicate



Q4 Which is the rarest naturally occurring element in the Earth's crust, which has one of its isotopes with a half life of 8.1hrs.

- Astatine
- Uranium
- Lanthanum
- Osmium

Q5 Radha wishes to work in the National Chemical Laboratory. Which city should she be ready to move to?

- Kolkata
- Kanpur
- Chennai
- Pune

Q6 Which of these chemicals is seen as a red spray from the helicopters, is used to put off commonly occurring wild fires in most countries like the US?

- Mercuric iodide
- Ammonium Phosphate
- Mercuric oxide
- Red lead



Q7 Sodium azide is a chemical used commonly in air bags in cars, to provide protection during accidents. Name the gas that is released to inflate the air bags by undergoing a reaction on collision.

- Neon
- Argon
- Oxygen
- Nitrogen

Q8 Which chemist born in India won the Nobel Prize in Chemistry for studies of the structure and function of the ribosome?

- Subramanyan Chandrashekar
- Abhijit Banerjee
- Venki Ramakrishnan
- Har Gobind Khurana



Q9 The planet Mars referred to as the 'Red Planet' appears red due to the effect of which compound?

- Mercuric oxide
- Tri lead tetra oxide
- Iron oxide
- Silicon dioxide

Q10 Which chemical compound is commonly used in the indelible ink applied to the index finger during elections?

- Silver nitrate
- Iodine
- Copper oxide
- Mercuric iodide



## ANSWERS

- c) S-propanethial-S-oxide
- d) Frederick Sanger
- d) Sodium silicate
- a) Astatine
- d) Pune
- b) Ammonium phosphate
- d) Nitrogen
- c) Venki Ramakrishnan
- c) Iron oxide
- a) Silver nitrate

## MY SCHOOL PROJECT AGRIBOT

## WHAT IS IT?

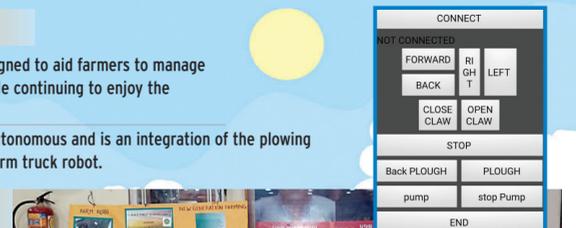
- It is an agricultural bot that is designed to aid farmers to manage their farms in villages efficiently, while continuing to enjoy the benefits of migrating to cities.
- This farming robot is completely autonomous and is an integration of the plowing robot, the pumping system and the farm truck robot.

## SALIENT FEATURES:

- The robot has been created using Arduino, it is Bluetooth enabled and can be controlled by an e-farming app named 'Agribot' which has been developed especially by our team.
- Due to its unmanned nature, it can help in utilizing the 12% uncultivated land where human settlements are not possible.
- Our robot aims to productively contribute in the 'Pradhan Mantri Krishi Sinchai Yojna'.
- It helps in reducing suicide rate in farmers, whose major cause is high levels of debt, due to the reliance on traditional and extremely laborious farming methods.

## MORE FACTS:

- There is about 6% of uncultivated land in India that can be converted into tillable land, which is a whopping 96,00,000 hectares!
- We bagged second prize for this robot in the 'make your own robot' competition organized by Lion's Club, Thane.



## CONSTRUCTION OF THE AGRIBOT:

- The Agribot is a trio of three robots. The plowing robot consists of 2 motors programmed in such a way that after one forward and backward moment, it stops automatically.
- The irrigation robot draws water from the well on the farm. A pump is immersed into the well which is further connected to a pipe.
- The farm truck robot has two arms that can pick up the waste products, or help in the transport of substances from one place on the farm to another.
- The truck has a specially designed track that ensures its smooth functioning without clashing with any other equipment.



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