

1. Recently, the Institute of Nano Science and Technology (INST) has developed a low-cost metal-free nanomaterial 'Carbon Nitride Quantum Dots (g-CNQDs)'. Which of the following is the significance of g-CNQDs?

- a) Enhanced Solar Energy Harvesting
- b) High speed data transfer
- c) Visible light microbial disinfection
- d) Quantum encryption

Ans: C

Explanation

- Recently, scientists at the **Institute of Nano Science and Technology (INST)**, an autonomous institute under the Department of Science and Technology, have found a **low-cost metal-free nanomaterial for visible light microbial disinfection** which can be an alternative to silver and other metal-based materials.
- They have tested **carbon nitride quantum dots (g-CNQDs)** for visible-light-driven antibacterial activity and **found it to be efficient**, apart from being biocompatible with mammalian cells. The INST has suggested it to be a **viable anti bacterial alternative to metal/non-metal semiconductors** and expensive silver, thus making it cost-effective.
- The g-CNQDs have the **ability to generate reactive oxygen species (ROS)**. The ROS rapidly interact and **damage the immediately available biological macromolecules** such as lipids present on the cell membrane or envelope and proteins present on the cellular surface, towards inactivation of the microorganism.
- The mechanism of inactivation is **non-specific to a particular pathogen**, as lipid and protein are major components of the inhabitants of the microbial world.

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- The **dependence on visible light is advantageous over regular ultraviolet** mediated disinfection, which requires cautious handling of the UV light-emitting devices. This technology will also be simultaneously explored for **antiviral efficiency** considering its relevance to the current scenario

<https://pib.gov.in/newsite/PrintRelease.aspx?relid=202562>

2. Why is a plant called 'Anthurium' often mentioned in news?

- a) Its extract is used in the synthesis of pesticides
- b) It tends to reduce the biodiversity in the area in which it grows
- c) Its extract is used as an anti-viral drug in traditional system of medicines
- d) It purifies the surrounding air and removes harmful airborne chemicals

Ans: D

Explanation

- Anthurium is one of the **best domestic flowering plants** in the world. It **purifies the surrounding air and removes harmful airborne** chemicals like formaldehyde, ammonia, toluene, xylene, and allergens
- Due to its importance of removing toxic substances from the air, **NASA has placed it in the list of air purifier plants**
- National Innovation Foundation-India (NIF) has **facilitated mass multiplication** and large scale production of four highly demanded varieties of this plant through **tissue culture technique** at the Indian Institute of Horticultural Research (IIHR), Bangalore, for the diffusion of the varieties in similar agro-climatic zones of the country
- ✓ Recently, **D Vasini Bai, a women innovator** from Thiruvananthapuram, Kerala, has developed 10 varieties of Anthurium

National Innovation Foundation (NIF)

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- The National Innovation Foundation (NIF) - India was set up in March 2000 with the assistance of Department of Science and Technology, Government of India.
- It is India's **national initiative to strengthen the grassroots technological innovations** and outstanding traditional knowledge.
- Its mission is to **help India become a creative and knowledge-based society** by expanding policy and institutional space for grassroots technological innovators

<http://nif.org.in/innovation/improved-varieties-of-Anthurium-and-its-planting-method/946>

3. Consider the following statements regarding the Central Vigilance Commission (CVC)

1. It exercise superintendence over the vigilance administrations of the various Central Government Ministries, Departments and Organizations of the Central Government
2. The CVC was accorded the status of independent statutory authority through the Prevention of Corruption Act, 1988
3. It shall have all the powers of a Civil court while conducting any inquiry

Which of the statements given above is/are correct?

- a) 2 and 3 only
- b) 1 and 3 only
- c) 1 and 2 only
- d) 2 only

Ans: B

Explanation

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- The Central Vigilance Commission was set up by the Government in February, 1964 on the **recommendations of the Committee on Prevention of Corruption**, headed by Shri K. Santhanam, to advise and guide Central Government agencies in the field of vigilance
- CVC are conceived to be the **apex vigilance institution**, free of control from any executive authority, monitoring all vigilance activity under the Central Government and advising various authorities in Central Government organizations in planning, executing, reviewing and reforming their vigilant work.
- Consequent upon promulgation of an Ordinance by the President, the Central Vigilance Commission has been made a multi member Commission with "**statutory status**" with **effect from 25th August, 1998**
- The Commission shall consist of
 - A Central Vigilance Commissioner - Chairperson
 - Not more than two Vigilance Commissioners – Members
- They are **appointed by the President on recommendation of a Committee** consisting of the Prime Minister (Chairperson), the Minister of home affairs and the Leader of the Opposition in the House of the People
- **Statement 2 is incorrect:** The Central Vigilance Commission was setup by a Government Resolution in 1964. The Commission was accorded the status of independent **statutory authority through the Central Vigilance Commission Act, 2003**

Vision

- As the apex integrity institution, the Commission is **mandated to fight corruption** and to ensure integrity in public administration.

Roles & Functions

- **Exercise superintendence over the functioning of the Delhi Special Police Establishment (CBI)** insofar as it relates to the investigation of offences under the

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Prevention of Corruption Act, 1988; or an offence under the Cr.PC for certain categories of public servants

- To inquire or cause an inquiry or investigation to be made on a **reference by the Central Government**
- Review the **progress of investigations conducted by the DSPE** into offences alleged to have been committed under the Prevention of Corruption Act, 1988 or an offence under the Cr.PC
- **Statement 1 is correct: Exercise superintendence over the vigilance administrations** of the various Central Government Ministries, Departments and Organizations of the Central Government
- **Statement 3 is correct: Shall have all the powers of a Civil court** while conducting any inquiry
- The Central Vigilance Commissioner (CVC) is the Chairperson and the Vigilance Commissioners (Members) of the Committee, on whose recommendations, the Central Government appoints the Director of Enforcement

<https://www.cvc.nic.in/about/background>

<https://www.thehindu.com/news/national/sanjay-kothari-appointed-central-vigilance-commissioner/article31430459.ece>

4. The 'Trade and Development Report' is being released by which of the following?

- a) IMF
- b) World Bank
- c) UNCTAD
- d) World Trade organization (WTO)

Ans: C

Explanation

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- **The United Nations Conference on Trade and Development (UNCTAD)** has released its latest Trade and Development Report

Key points of report

- Developing countries may see their **public external debt increase** to \$2.4-3.6 trillion in 2020 and 2021
- Even before the coronavirus pandemic hit in developing economies, **many of them are trapped in a debt-spiral** — struggling with unsustainable debt burdens for many years, as well as with rising health and economic needs
- The financial turmoil from the crisis has **triggered record portfolio capital outflows** from emerging economies and sharp currency devaluations in developing countries, making servicing their debts more onerous

UNCTAD

- UNCTAD is a **permanent intergovernmental body** established by the United Nations General Assembly in 1964. Its headquarters are located in Geneva, Switzerland
 - UNCTAD is **part of the UN Secretariat**. It reports to the UN General Assembly and the Economic and Social Council
- Reports published by UNCTAD are
- Trade and Development Report
 - World Investment Report
 - Technology and Innovation Report
 - Digital Economy Report

<https://unctad.org/en/Pages/aboutus.aspx>

5. Arrange the following seas in Mediterranean region as one proceeds from west to east?

1. Sea of Crete

- 2. Black Sea
- 3. Ionian Sea

Select the correct answer using the codes given below

- a) 3-1-2
- b) 1-2-3
- c) 3-2-1
- d) 1-3-2

Ans: A

Explanation

