INSTA Revision Plan 3.0 - 2020

INSTA Tests

DAYS 21 to 24

SOLUTIONS

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Congratulations
1. Pegasus often seen in news is a
   (a) Fastest Supercomputer in the world.
   (b) Spyware tool
   (c) Ransomware
   (d) None of the above

   **Solution: B**

   - WhatsApp has been used to spy on journalists and human rights activists in India in 2019. The surveillance was carried out using a **spyware tool** called **Pegasus**, which has been developed by an Israeli firm, the NSO Group.

   - The surveillance was carried out “between in and around April 2019 and May 2019” on users in 20 countries across four continents.

   - In response, WhatsApp has sued the NSO Group in a federal court, accusing it of using WhatsApp servers in the United States and elsewhere “to send malware to approximately 1,400 mobile phones and devices (‘Target Devices’) for the purpose of conducting surveillance of specific WhatsApp users (‘Target Users’)”.

   **Concerns:**
   - Tools that enable surveillance into our private lives are being abused, and the proliferation of this technology into the hands of irresponsible companies and governments puts us all at risk.

   - WhatsApp, which is owned by Facebook, is the world’s most popular messaging app, with more than 1.5 billion users worldwide. About a quarter of those users — more than 400 million, or 40 crore — are in India, WhatsApp’s biggest market.

2. Consider the following statements regarding CollabCAD

   1. It is an initiative of Confederation of Indian Industry.
   2. It is a collaborative network, computer enabled software system, providing a total engineering solution from 2D drafting & detailing to 3D product design.

   Which of the statements given above is/are correct?

   (a) 1 only
   (b) 2 only
   (c) Both 1 and 2
Atal Innovation Mission, NITI Aayog & National Informatics Centre (NIC) jointly launched CollabCAD in ATL schools.

What is CollabCAD?

- It is a collaborative network, computer enabled software system, providing a total engineering solution from 2D drafting & detailing to 3D product design.
- The aim of this initiative is to provide a great platform to students of Atal Tinkering Labs (ATLs) across country to create and modify 3d designs with free flow of creativity and imagination.
- This software would also enable students to create data across the network and concurrently access the same design data for storage and visualization.

Tinker from Home campaign:

- In light of the current situation, the ATL program has launched a ‘Tinker from Home’ campaign to ensure that the children across the county have access to useful easy-to-learn online resources to keep themselves fruitfully occupied.
- The objective of the initiative is to harness the creativity and innovativeness of children by encouraging learning through self-initiation.

3. Consider the following statements regarding Ude Desh Ka Aam Nagrik scheme

1. It aims to increase ticketing volume from 80 million to 300 million by 2022.
2. The scheme will run for 10 years.
3. The scheme will be jointly funded by the central government and state governments.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Solution: D
About Regional Connectivity Scheme UDAN:

- UDAN, which stands for ‘Ude Desh Ka Aam Nagrik’, aims to make air travel affordable and widespread.
- It aims to increase ticketing volume from 80 million to 300 million by 2022.
- The Ministry of Civil Aviation had launched Regional Connectivity Scheme (RCS) in October 10 2016 to stimulate regional air connectivity and making air travel affordable to the masses.
- The scheme will be jointly funded by the central government and state governments.
- The scheme will run for 10 years and can be extended thereafter.

Viability Gap Funding (VGF):

- The scheme entails making the routes financially viable, without insisting on the financial viability of the regional airports, by lowering the cost of flight operations and through financial support in the form of Viability Gap Funding (VGF). VGF will be available to flight operators on specific routes for the first 3 years of operation.

UDAN 4.0:

- The 4th round of UDAN was launched in December 2019 with a special focus on North-Eastern Regions, Hilly States, and Islands.
- The airports that had already been developed by Airports Authority of India (AAI) are given higher priority for the award of VGF (Viability Gap Funding) under the Scheme.
- Under UDAN 4, the operation of helicopter and seaplanes is also been incorporated.

4. The Centre of Excellence (CoE) in Blockchain Technology was set up at
   (a) Delhi
   (b) Hyderabad
   (c) Bengaluru
   (d) Pune

Solution: C

- National Informatics Centre (NIC) has set up a Centre of Excellence (CoE) in Blockchain Technology in Bengaluru, which will provide Blockchain as a service and allow stakeholders to benefit from shared learning, experiences and resources.
Functions:

- The Centre of Excellence will facilitate various government departments in building proof of concepts for use of Blockchain technology in different dimensions of governance, leading to large scale deployment of some such applications.

- With National Informatics Centre (NIC) providing a robust and an agile infrastructure, the CoE shall also provide Blockchain as a Service (BaaS) for efficient hosting of Blockchain network, says an official release.

What are Blockchains?

- **Blockchains** are a new data structure that is secure, cryptography-based, and distributed across a network.

- The technology supports cryptocurrencies such as Bitcoin, and the transfer of any data or digital asset.

- Spearheaded by Bitcoin, blockchains achieve consensus among distributed nodes, allowing the transfer of digital goods without the need for centralized authorisation of transactions.

How it operates?

- The technology allows transactions to be simultaneously anonymous and secure, peer-to-peer, instant and frictionless.

- It does this by distributing trust from powerful intermediaries to a large global network, which through mass collaboration, clever code and cryptography, enables a tamper-proof public ledger of every transaction that’s ever happened on the network.

- A block is the “current” part of a blockchain which records some or all of the recent transactions, and once completed, goes into the blockchain as permanent database.

- Each time a block gets completed, a new block is generated. Blocks are linked to each other (like a chain) in proper linear, chronological order with every block containing a hash of the previous block.

5. According to Representation of People Act, 1950 which of the followings are qualified as service voter?

1. Those serving in the Armed Forces of the Union.
2. Those serving in a Force to which the Army Act 1950 applies
3. Member of an Armed Police Force of a State, serving outside that state.
4. Those employed under the Government of India, in a post outside India.

Select the correct answer using the code given below:

(a) 1, 2 and 3 only
(b) 2, 3 and 4 only
(c) 1, 3 and 4 only
(d) 1, 2, 3 and 4

**Solution: D**

**Service Voter:**

- The soldiers of Indo-Tibetan Border Police (ITBP) were the first to cast their vote for the 2019 Lok Sabha elections in Arunachal Pradesh as Service Voters.

- **Service voter belonging to defence and paramilitary forces** have the option of either voting through postal ballot or through a proxy voter duly appointed by him/her.

- There are roughly 30 lakh service voters including defence and paramilitary forces who (in many cases with families at family stations) will cast their votes through service voter facility.

**Who is a service voter?**

Service voter is a voter having service qualification. According to the provisions of sub-section (8) of Section 20 of Representation of People Act, 1950, service qualification means:

1. Being a member of the **armed Forces of the Union**; or
2. Being a member of a force to which provisions of the **Army Act, 1950** (46 of 1950), have been made applicable whether with or without modification;
3. Being a member of an **Armed Police Force of a State**, and serving outside that state; or
4. Being a person who is employed under the Government of India, in a **post outside India**.

**How is a service voter different from an ordinary elector?**

- While an ordinary elector is registered in the electoral roll of the constituency in which his place of ordinary residence is located, person having service qualification can get enrolled as ‘service voter’ at his native place even though he actually may be residing at a different place (of posting). He has, however, an option to get himself enrolled as general elector at the place of his posting where he factually, at the point of time, is residing ordinarily with his family for a sufficient span of time.

**Are members of all Armed Forces / Para Military Forces eligible to be enrolled as service voters?**

- As per the existing arrangements, members of Indian Army, Navy and Air Force and personnel of General Reserve Engineer Force (Border Road Organization), Border Security Force, Indo Tibetan Border Police, Assam Rifles, National Security Guards, Central Reserve Police Force, Central Industrial Security Force and Sashastra Seema Bal are eligible to be registered as service voters.
Is wife or son/daughter of a service voter also enrolled as a service voter?

- The wife of a service voter shall, if she is ordinarily residing with him, be also deemed to be a service voter in the constituency specified by that person. The service voter has to make a statement to the effect in the relevant Form 2/2A/3 that his wife ordinarily resides with him. The wife will be enrolled as a service voter on the basis of declaration made by her husband in the application form itself submitted by him and no separate declaration/application is required to be made by the wife. A son/daughter/relative/servant etc. residing ordinarily with a service voter cannot be enrolled as service voter.

6. Consider the following statements regarding Contract for the Web

1. It is a legal document under United Nations document.
2. The idea is to create a global plan of action for all stakeholders to together commit to building a better Web.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: B

Sir Tim Berners-Lee, inventor of the World Wide Web, has announced a “Contract for the Web” — aimed at saving the future of his invention.

What is the Contract for the Web?

- The idea is to create a global plan of action for all stakeholders to together commit to building a “better” Web. The goal is to create a standard policy for a Web that benefits all.
- The Contract consists of nine principles — three each for governments, private companies, and individuals and civil society to endorse.
- It has been created by representatives from over 80 organisations, including governments, companies, civil society activists, and academics.

What are the principles in the Contract?

- Governments will “Ensure everyone can connect to the Internet”, “Keep all of the Internet available, all of the time”, and “Respect and protect people’s fundamental online privacy and data rights”.
Companies will “Make the Internet affordable and accessible to everyone”, “Respect and protect people’s privacy and personal data to build online trust”, and “Develop technologies that support the best in humanity and challenge the worst”.

Citizens will “Be creators and collaborators on the Web”, “Build strong communities that respect civil discourse and human dignity”, and “Fight for the Web” so that it “remains open and a global public resource for people everywhere, now and in the future”.

Relevance of the contract:

- The Contract is not meant to be “simply aspirational”, or just a “declaration”. “It’s actually meant to be implemented, and it’s meant to be a plan of action.
- Governments who are looking to regulate in the digital era, can use the contract as a roadmap to lay out their policies and laws going forward.
- Companies had themselves reached out to be active participants in the Contract. This was an opportunity for them to have conversations with governments and civil society instead of shouting at each other.

How will the Contract be implemented?

- The ‘Contract for the Web’ is not a legal document, or a United Nations document — though the organisation is in talks with the UN. It cannot currently bend governments or companies — even those that are on board — to its will.

Need of the hour:

- The Web, which is now almost an essential condition for human existence, is at a tipping point and needs radical intervention from all stakeholders — governments, companies, civil society groups, as well as individual users.
- Citizen action is an important part of the Contract, and the organization hopes citizens would hold governments and companies accountable for violations of its terms.

7. Consider the following statements regarding High-Temperature Proton Exchange Membrane (HTPEM) technology

1. It is India’s first indigenously developed high-temperature based Fuel Cell System.
2. It has been developed by the Council of Scientific and Industrial Research (CSIR).

Which of the statements given above is/are correct?

(a) 1 only  
(b) 2 only  
(c) Both 1 and 2  
(d) Neither 1 nor 2
Solution: C

- India’s first indigenously developed high-temperature based Fuel Cell System was recently introduced. It is a 5.0 kW fuel cell system that generates power in a green manner.
- The developed fuel cells are based on High-Temperature Proton Exchange Membrane (HTPEM) technology.

Key facts:
- Developed under the Public-Private Partnership (PPP) model by the Council of Scientific and Industrial Research (CSIR) in partnership with Indian industries.
- Built under India’s flagship programme named ‘New Millennium Indian Technology Leadership Initiative (NMITLI)’.

How it works?
- It takes methanol or bio-methane as the input and produces heat and water as its bi-products, which can be further used. This helps to attain an efficiency that is greater than 70%, which is difficult to achieve by other energy sources.

Applications:
- Suitable for distributed stationary power applications like; for small offices, commercial units, data centers etc.; where highly reliable power is essential with simultaneous requirement for air-conditioning.
- It will also meet the requirement of efficient, clean and reliable backup power generator for telecom towers, remote locations and strategic applications as well.
- Replace Diesel Generating (DG) sets and help reduce India’s dependence on crude oil.

What is HTPEM technology?
- High Temperature Proton-Exchange-Membrane (HTPEM) is the core of the fuel cells running above 150 °C. As in classical PEM fuel cells technology, Hydrogen is electrochemically split to proton and electron on anode. Proton is transported through membrane to cathode while electricity is yielded in external circuit. At cathode protons recombine with electron and reacts further with Oxygen to water and heat.
- The technology can achieve efficiency approaching 90% calculated as combined yield of electricity and heat.

8. Consider the following statements regarding International Criminal Court (ICC)
   1. It is the court of last resort for prosecution of genocide, war crimes, and crimes against humanity.
   2. It may exercise its jurisdiction only when national courts are unwilling or unable to prosecute criminals
3. India is a member of the ICC.

Which of the statements given above is/are correct?

(a) 1 and 2 only  
(b) 2 and 3 only  
(c) 1 and 3 only  
(d) 1, 2 and 3

Solution: A

About International Criminal Court (ICC):

- The International Criminal Court (ICC), located in The Hague, is the court of last resort for prosecution of genocide, war crimes, and crimes against humanity.

- It is the first permanent, treaty based, international criminal court established to help end impunity for the perpetrators of the most serious crimes of concern to the international community.

- Its founding treaty, the Rome Statute, entered into force on July 1, 2002.

- Funding: Although the Court’s expenses are funded primarily by States Parties, it also receives voluntary contributions from governments, international organisations, individuals, corporations, and other entities.

- Composition and voting power: The Court’s management oversight and legislative body, the Assembly of States Parties, consists of one representative from each state party.

- Each state party has one vote and “every effort” has to be made to reach decisions by consensus. If consensus cannot be reached, decisions are made by vote. The Assembly is presided over by a president and two vice-presidents, who are elected by the members to three-year terms.

Jurisdiction:

- The ICC has the jurisdiction to prosecute individuals for the international crimes of genocide, crimes against humanity, and war crimes.

- The ICC is intended to complement existing national judicial systems and it may therefore only exercise its jurisdiction when certain conditions are met, such as when national courts are unwilling or unable to prosecute criminals or when the United Nations Security Council or individual states refer situations to the Court.

India is not a member of the ICC.
9. Consider the following statements regarding REN21

1. REN21 is the only global renewable energy community of actors from science, governments, NGOs and industry.

2. REN21 was created in 2004 as an outcome of the Bonn 2004 International Conference on Renewable Energy.

3. India is a member.

Which of the statements given above is/are correct?

(a) 1 and 2 only

(b) 1 and 3 only

(c) 2 and 3 only

(d) 1, 2 and 3

Solution: D

REN21 is the only global renewable energy community of actors from science, governments, NGOs and industry. We provide up-to-date and peer-reviewed facts, figures and analysis of global developments in technology, policies and markets. Our goal: enable decision-makers to make the shift to renewable energy happen – now.

- REN21 was created in 2004 as an outcome of the Bonn 2004 International Conference on Renewable Energy. This “coalition of the willing” came together with one objective in mind: to support and accelerate the development of renewable energy.

- From the outset, REN21’s mandate has been to collect, consolidate and synthesise a vast body of renewable energy data to provide clear and reliable information on what is happening in real-time. This mandate still holds today.

- REN21 members are industry associations, governments, inter-governmental organisations, NGOs, and academic and scientific institutions. An elected number of members form REN21’s Steering Committee – the main governing body of REN21.

- REN21 Members convene every three years to review the proposed upcoming, three-year work plan and to elect a REN21 Steering Committee. This Steering Committee represents the REN21 community, providing strategic direction to REN21’s work programme.

10. Consider the following statements regarding Internet Saathi programme

1. It is joint initiative of Google India and Tata Trusts.

2. It aims to facilitate digital literacy among tribal and minority women

Which of the statements given above is/are correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

**Solution: A**

About Internet Saathi:
- It is joint initiative of Google India and Tata Trusts.
- It aims to facilitate **digital literacy among women in rural India**.
- The programme aims to train Saathis in villages that can in turn help educate other women from their village in the use of the internet.

Significance of the initiative:
- It has contributed towards **bridging digital gender divide in rural India**. Women trained under this initiative have started their own micro-business such as stitching, honeybee farming, and beauty parlours. Many under programme are also driving awareness for issues like girl child education, menstrual hygiene and more within their communities.

11. Consider the following statements regarding Extra Neutral Alcohol (ENA)

1. It is a byproduct of the sugar industry.
2. It is the primary raw material for making alcoholic beverages.
3. It has a neutral smell and taste and typically contains around 5 per cent alcohol by volume.

Which of the statements given above is/are correct?
- (a) 1 and 2 only
- (b) 1 and 3 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

**Solution: A**
Extra Neutral Alcohol (ENA)

- Alcohol manufacturers citing a shortage of domestic supplies have sought a reduction in import duty of Extra Neutral Alcohol to make it cost-effective for them to import from global markets.

What is ENA?

- It is a byproduct of the sugar industry.
- Formed from molasses that are a residue of sugarcane processing.
- It is the primary raw material for making alcoholic beverages.

Features:

- It is colourless food-grade alcohol that does not have any impurities.
- It has a neutral smell and taste and typically contains over 95 per cent alcohol by volume.

Other applications of ENA:

- An essential ingredient in the manufacture of cosmetics and personal care products such as perfumes, toiletries, hair spray, etc.
- Utilized in the production of some lacquers, paints and ink for the printing industry, as well as in pharmaceutical products such as antiseptics, drugs, syrups, medicated sprays.

12. Consider the following statements regarding ASKDISHA

1. It is an Artificial Intelligence-based chatbot developed by Indian Railway Catering and Tourism Corporation (IRCTC).
2. The aim is to resolve queries of railway passengers over the internet pertaining to various services offered.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: C

The Indian Railways Catering & Tourism Corporation Limited (IRCTC) has powered voice-enabled ASKDISHA Chatbot to converse with customers in the Hindi language. The customers can now ask queries to ASKDISHA in Hindi by voice as well as text.
What is ASKDISHA Chatbot?

It is an **Artificial Intelligence-based chatbot**. It is a special computer programme designed to simulate conversation with users, especially over the internet. Initially launched in the English language in October 2018. Developed by Indian Railway Catering and Tourism Corporation (IRCTC). The aim is to resolve queries of railway passengers over the internet pertaining to various services offered.

**Services provided:**

Since its initial launch, passengers seeking help on the **reservation of tickets**, **cancellation**, enquiry of **refund status**, **fare**, **PNR search**, **train running status**, **enquiry about retiring rooms** and **tourism products** have been benefited.

**13.** SHAHAB-3 is a medium-range ballistic missile developed by

(a) India  
(b) France  
(c) USA  
(d) Iran

**Solution: D**

The **Shahab-3** is a quad-exhaust liquid-propelled medium-range ballistic missile developed by **Iran** and based on the North Korean Nodong-1. The Shahab-3 has a range of **1,000 kilometres**; a **MRBM variant** can now reach **2,000 kilometres**.

**14.** Consider the following statements regarding Solar power in India

1. The country’s solar installed capacity reached 35.12 GW.  
2. Rooftop solar power accounts for 20 GW, of which 70% is industrial or commercial.

Which of the statements given above is/are correct?

(a) 1 only 
(b) 2 only 
(c) Both 1 and 2 
(d) Neither 1 nor 2

**Solution: A**
Solar power in India is a fast-developing industry. The country’s solar installed capacity reached 35.12 GW as of 30 June 2020. India has the lowest capital cost per MW globally of installing solar power plants.

- The Indian government had an initial target of 20 GW capacity for 2022, which was achieved four years ahead of schedule.
- In 2015 the target was raised to 100 GW of solar capacity (including 40 GW from rooftop solar) by 2022, targeting an investment of US$100 billion.
- India has established nearly 42 solar parks to make land available to the promoters of solar plants. In the decade ending 31 March 2020, India expanded its installed solar power capacity by 233 times from 161 MW to 37,627 MW.
- Rooftop solar power accounts for 2.1 GW, of which 70% is industrial or commercial. In addition to its large-scale grid-connected solar photovoltaic (PV) initiative, India is developing off-grid solar power for local energy needs.
- Solar products have increasingly helped to meet rural needs; by the end of 2015 just under one million solar lanterns were sold in the country, reducing the need for kerosene.
- That year, 118,700 solar home lighting systems were installed and 46,655 solar street lighting installations were provided under a national program; just over 1.4 million solar cookers were distributed in India.

The International Solar Alliance (ISA), proposed by India as a founder member, is headquartered in India. India has also put forward the concept of “One Sun One World one Grid” to harness abundant solar power on global scale.

15. Yogyakarta principles, sometime seen in the news, is related to
   (a) Yoga practices
   (b) Human Rights
   (c) Climate Change
   (d) Sustainable Development

   Solution: B

The Yogyakarta Principles is a document about human rights in the areas of sexual orientation and gender identity, published as the outcome of an international meeting of human rights groups in Yogyakarta, Indonesia, in November 2006.

https://yogyakartaprinicples.org/
16. Consider the following statements regarding Sustainable Energy for All (SEforALL)

1. It is an international organization working with leaders in government, the private sector and civil society
2. Former UN Secretary-General Ban Ki-moon launched the Sustainable Energy for All initiative in 2019.
3. It aims to drive further, faster action toward achievement of Sustainable Development Goal 7 (SDG7)

Which of the statements given above is/are correct?

(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

**Solution: B**

Sustainable Energy for All (SEforALL) is an international organization working with leaders in government, the private sector and civil society to drive further, faster action toward achievement of Sustainable Development Goal 7 (SDG7), which calls for universal access to sustainable energy by 2030, and the Paris Agreement, which calls for reducing greenhouse gas emissions to limit climate warming to below 2° Celsius.

Achieving these goals will require a radical rethink of the way we produce, distribute and consume energy. SEforALL is at the heart of this foundational shift to ensure no one is left behind. Drawing on data and evidence, we identify a critical path to success in achieving SDG7.

Former UN Secretary-General Ban Ki-moon launched the Sustainable Energy for All initiative in 2011. Now an independent organization, we maintain close links with the UN, including through a relationship agreement, partnerships with UN agencies and with SEforALL’s CEO acting as the UN Secretary-General’s Special Representative for Sustainable Energy for All and Co-Chair of UN-Energy.

Our staff is based at our headquarters in Vienna, Austria and at our satellite office in Washington, DC in the United States. Governance is provided by the SEforALL Administrative Board.

17. Consider the following statements regarding the proton exchange membrane fuel cell (PEMFC):

1. It uses hydrogen gas (H2) and oxygen gas (O2) as fuel.
2. The products of the reaction in the cell are water, electricity, and heat.
Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: C

A fuel cell is a device that converts chemical potential energy (energy stored in molecular bonds) into electrical energy. A PEM (Proton Exchange Membrane) cell uses hydrogen gas (H2) and oxygen gas (O2) as fuel. The products of the reaction in the cell are water, electricity, and heat. This is a big improvement over internal combustion engines, coal burning power plants, and nuclear power plants, all of which produce harmful by-products.

Since O2 is readily available in the atmosphere, we only need to supply the fuel cell with H2 which can come from an electrolysis process (see Alkaline electrolysis or PEM electrolysis).

18. Tishreen Revolution, sometime seen in the news, is occurred in which of the following nation?

(a) Taiwan  
(b) Iraq  
(c) Syria  
(d) Egypt

Solution: B

The 2019 Iraqi protests have been named Tishreen Revolution or October Revolution or Iraqi Intifada. It was started in October 2019 in the social media by civil activists.

It then spread to northern and southern provinces of the country. The protests were against the 16 years of corruption in the country. It also aimed to stop the Iranian intervention in Iraq.

https://www.thehindu.com/opinion/op-ed/iraqs-autumn-of-discontent/article30270123.ece
19. Which of the following is/are advantages of Radio Frequency Identification (RFID) over Barcode system?

1. In most of the cases, Line of sight is not required for scanning items in Radio Frequency Identification (RFID) technology.
2. RFID readers can read multiple RFID tags simultaneously, offering increases in efficiency.
3. RFID technology automates data collection and vastly reduces human effort and error.

Select the correct answer using the code given below.

(a) 1 only
(b) 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Solution: D

Radio Frequency Identification (RFID) is the wireless non-contact use of radio frequency waves to transfer data. Tagging items with RFID tags allows users to automatically and uniquely identify and track inventory and assets.

The Advantages of RFID vs. barcode technology:

- No line of sight requirement.
- The tag can stand a harsh environment.
- Tracking people, items, and equipment in realtime.
- Long read range.
- Portable database
- Multiple tag read/write.
**Radio-Frequency Identification - RFID**

**READ RATE**
- Passive UHF RFID: 40 ft. (fixed reader)
  - 20 ft. (handheld reader)
- Active UHF RFID: 100+ feet
- Several inches to several feet

**TECHNOLOGY**
- RF (Radio Frequency)
- Optical (Laser)

**IDENTIFICATION**
- Uniquely identifies each item/asset tagged
- Most only identify the type of item, but not uniquely; sequential tags often needed

**INTERFERENCE**
- Metal and liquids can interfere with some radio frequencies
- Obstructed barcodes can't be read (such as dirt covered or torn barcode)

**READ/WRITE**
- Many RFID tags are read/write capable
- Read only

**AUTOMATION**
- Most fixed readers are automated and don't require human involvement
- Most barcode scanners require human operation and are labor intensive

**Barcode Label and Scanning**
20. Consider the following statements regarding Chandipura Virus (CHPV)

1. The virus predominantly infects children.
2. The virus is known to cause inflammation of the brain, and progresses rapidly from an influenza-like illness to coma and death.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: C

Chandipura vesiculovirus (CHPV) is a member of the Rhabdoviridae family that is associated with an encephalitic illness in humans.

- It was first identified in 1965 after isolation from the blood of two patients from Chandipura village in Maharashtra state.
- The likely vector (carrier) of the virus is the female phlebotomine sandfly. The virus predominantly infects children between the ages of 2-16, spreading through the bite of a sand-fly, and in some cases, even the mosquito during the monsoon and pre-monsoon season.
- It has been detected in sand flies in Senegal and Nigeria, apart from India. The virus is known to cause inflammation of the brain, and progresses rapidly from an influenza-like illness to coma and death.

21. Consider the following statements regarding the Breakthrough Listen Project:

1. It is a program of astronomical observations in search of evidence of intelligent life beyond Earth.
2. All data of the observations will be open to the public.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: C
• **Breakthrough Listen** is a $100 million program of astronomical observations in search of evidence of intelligent life beyond Earth. It is by far the most comprehensive, intensive and sensitive search ever undertaken for artificial radio and optical signals. A complete survey of the 1,000,000 nearest stars, the plane and center of our galaxy, and the 100 nearest galaxies. All data will be open to the public.

22. Consider the following statements regarding the Global Geothermal Alliance (GGA):

1. It is supported and coordinated by the International Energy Agency (IEA)
2. It was launched at the 24th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 24), held in Katowice.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

*Solution: D*

The **Global Geothermal Alliance (GGA)** serves as a platform for dialogue, co-operation and co-ordinated action between the geothermal industry, policy makers and stakeholders worldwide.

- Launched at the **2015 United Nations Climate Change Conference, COP 21 or CMP 11** was held in **Paris, France**, the GGA is a coalition for action to increase the use of geothermal energy, both in power generation and direct use of heat. It calls on governments, business and other stakeholders to support geothermal deployment and realise its potential.

- The GGA has aspirational goals to achieve fivefold growth in the installed capacity of geothermal power generation and more than twofold growth in geothermal heating by 2030.

**What is the GGA designed to do?**

- Foster an enabling environment to attract investment in geothermal energy.
- Provide customised support to regions and countries with geothermal market potential.
- Facilitate the exchange of insights and experience among key stakeholders in the geothermal energy value chain.
- Identify and promote models for sharing and mitigating risks, in order to attract private investment and integrate geothermal facilities into energy markets.
• Help to streamline outreach to give geothermal energy greater visibility in the global energy and climate debates.

• Global Geothermal Alliance is supported and coordinated by the International Renewable Energy Agency

23. Consider the following statements regarding Zero Budget Natural Farming (ZBNF)

1. The word Zero Budget refers to zero net cost of production of all crops.
2. Vermicomposting is the core feature of ZBNF
3. It promotes soil aeration, Minimal watering and Intercropping.

Which of the statements given above is/are correct?

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

Solution: D

Zero budget natural farming (ZBNF) is a method of chemical-free agriculture drawing from traditional Indian practices.

• It is different from organic farming. The word Zero Budget refers to zero net cost of production of all crops.

• The main aim of ZBNF is eliminate use of chemical pesticides and uses biological pesticides and promote of good agronomic practices.

• The ZBNF method promotes: Soil aeration, Minimal watering, Intercropping, Bunds and topsoil mulching.

• ZBNF is against vermicomposting, which is the mainstay of typical organic farming, as it introduces the most common composting worm, the European red wiggler (Eisenia fetida) to Indian soils.

Four Wheels of ZBNF

• Bijamrita (Seed Treatment using local cow dung and cow urine),

• Jiwamrita (applying inoculation made of local cow dung and cow urine without any fertilizers and pesticides)

• Mulching (activities to ensure favorable microclimate in the soil)

• Waaphasa (soil aeration)
24. Consider the following statements regarding the ‘Global Solar Atlas’

1. It is an initiative by the International Solar Alliance (ISA).
2. The primary aim of the Global Solar Atlas is to provide quick and easy access to solar resource and photovoltaic power potential data globally.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: B

The World Bank and the International Finance Corporation, collectively The World Bank Group, have provided this Global Solar Atlas in addition to a series of global, regional and country GIS data layers and poster maps, to support the scale-up of solar power in our client countries. This work is funded by the Energy Sector Management Assistance Program (ESMAP), a multi-donor trust fund administered by The World Bank and supported by 13 official bilateral donors. It is part of a global ESMAP initiative on Renewable Energy Resource Mapping that includes biomass, small hydro, solar and wind.

The World Bank Group has selected Solargis as its global provider of solar data and related solar energy assessment services. This Global Solar Atlas has been prepared by Solargis under a contract to The World Bank, based on a solar resource database that they own and maintain. For commercial enquiries, please contact Solargis directly.

The primary aim of this Global Solar Atlas is to provide quick and easy access to solar resource and photovoltaic power potential data globally, at a click of a mouse.

25. Consider the following statements regarding TRIFED

1. It is a national-level apex organization functioning under the administrative control of Ministry of Tribal Affairs.
2. It was established with core objective of institutionalizing the trade of Minor Forest Produce (MFP) and Surplus Agriculture Produce (SAP) collected/cultivated by tribals.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

**Solution: C**

**TRIFED** is a national-level apex organization functioning under the administrative control of Ministry of Tribal Affairs, Govt. of India.

It was established in August 1987 by the then Ministry of Welfare, Government of India, under the **Multi State Cooperative Societies Act 1984**.

TRIFED was established with core objective of institutionalizing the trade of **Minor Forest Produce (MFP)** and **Surplus Agriculture Produce (SAP)** collected/cultivated by tribals.

It has a network of 31 retail outlets called “**TRIBES INDIA**”, 37 consignment outlets of various State Emporia and 16 franchised outlets. The approach of marketing development of tribal products envisages TRIFED’s role as a facilitator and service provider.

It also works as an agency to the FCI for procurement of Wheat and Rice.

**DAY – 22**

26. Consider the following statements regarding Metamaterial

1. They are natural materials with unique internal microstructures.
2. The primary reason for the intensive interest in metamaterials is their unusual effect on light propagating through them.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

**Solution: B**

- They are artificially crafted materials with unique internal microstructures that give them properties not found in nature. The constituent artificial units of the metamaterial can be tailored in shape, size, and interatomic interaction, to exhibit unusual properties.
• **Metamaterial**, an *artificially structured material* that exhibits extraordinary electromagnetic properties not available or not easily obtainable in nature. Since the early 2000s, metamaterials have emerged as a rapidly growing interdisciplinary area, involving physics, electrical engineering, materials science, optics, and nanoscience. The properties of metamaterials are tailored by manipulating their internal physical structure. This makes them remarkably different from natural materials, whose properties are mainly determined by their chemical constituents and bonds. The primary reason for the intensive interest in metamaterials is their unusual effect on light propagating through them.

27. Consider the following statements regarding quantum dots

1. A quantum dot is a nanoparticle made of any semiconductor material.
2. The lab tests have shown that these quantum dots are more than 90% effective at wiping out antibiotic-resistant germs.
3. In the dark, the QDs remain inactive. When bombarded by visible light, they become energetically excited.

Which of the statements given above is/are correct?

(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

*Solution: D*
Scientists have developed **light-activated nanoparticles** — each roughly 20,000 times smaller than the thickness of a single human hair and have shown in lab tests that these “**quantum dots**” are more than 90% effective at **wiping out antibiotic-resistant germs** like Salmonella, E. coli and Staphylococcus.

**What are Quantum dots?**

- A **quantum dot** is a **nanoparticle** made of any semiconductor material such as silicon, cadmium selenide, cadmium sulfide, or indium arsenide. They are essentially small crystals of nanometer-size dimensions — they’re about 20,000 times smaller than the width of a human hair. They are each one million times smaller than a millimeter. They have distinctive electrical conduction properties that are determined by the incredibly small size and structure.

- When these QDs are hit with a specific frequency of radiation, their changeable structure, tailored by scientists, means that they can be finely tuned to emit a specific frequency of radiation; changing the wavelength of the light source can achieve the same effect.

- **In the dark, the QDs remain inactive.** When bombarded by visible light, they become energetically “excited.”

**Why we need them?**

- **Super-bacteria resistant** to the latest antibiotics, the last line of medical defence against various infections, cancer and HIV, is on the rise. These superbugs use evolutionary abilities to overwhelm medical advances. And to contain these bugs has been a challenging task for the scientists across the world.

**What led to their rise?**

- The rampant, indiscriminate administration of common antibiotics has allowed these bacteria the ability to shuffle their genes and defeat these drugs. Such bacteria include Salmonella, Staphylococcus and E. coli.

28. Consider the following statements regarding Nuclear Energy Agency (NEA)

1. It facilitates co-operation among countries with advanced nuclear technology infrastructures to seek excellence in nuclear safety, technology, science, environment and law.

2. It is an intergovernmental agency under the framework of UN.

3. India is a member of this agency.

Which of the statements given above is/are correct?

(a) 1 only

(b) 1 and 3 only

(c) 2 and 3 only

(d) 1, 2 and 3
**Solution: A**

The **Nuclear Energy Agency (NEA)** is an intergovernmental agency that facilitates co-operation among countries with advanced nuclear technology infrastructures to seek excellence in nuclear safety, technology, science, environment and law. The NEA, which is under the framework of the **Organisation for Economic Co-operation and Development**, is headquartered in **Paris, France**.

The NEA works as a forum for sharing information and experience and promoting international co-operation; a centre of excellence which helps member countries to pool and maintain their technical expertise and a vehicle for facilitating policy analyses and developing consensus based on its technical work.

The NEA’s current membership consists of 33 countries in **Europe**, the **Americas** and the **Asia-Pacific region**. **India is not a member**.

Together they account for approximately 82% of the world’s installed nuclear capacity. Nuclear power accounts for about one-fifth of the electricity produced in NEA member countries. The NEA works closely with the **International Atomic Energy Agency (IAEA)** in Vienna – a specialised agency of the United Nations – and with the European Commission in Brussels. Within the **OECD**, there is close co-ordination with the **International Energy Agency** and the **Environment Directorate**, as well as contacts with other directorates, as appropriate.

29. Consider the following statements regarding Low Enriched Uranium (LEU)
   1. The LEU Bank will be a reserve of LEU owned and controlled by the IAEA.
   2. The LEU that will be stored in the IAEA LEU Bank will have enrichment levels up to nominally 49.5%.
   3. LEU does not deteriorate and can be safely stored for many years.

Which of the statements given above is/are correct?
   (a) 1 and 2 only
   (b) 1 and 3 only
   (c) 2 and 3 only
   (d) 1, 2 and 3

**Solution: B**

The **IAEA Low Enriched Uranium (LEU) Bank** is an assurance of supply mechanism of last resort, and will be a physical reserve of LEU available for eligible **IAEA Member States**.
The IAEA LEU Bank will be a reserve of LEU owned and controlled by the IAEA, and a mechanism of last resort for Member States in case the supply of LEU to a nuclear power plant is disrupted due to exceptional circumstances and the Member State is unable to secure LEU from the commercial market or by any other means. The IAEA LEU Bank will be located at the Ulba Metallurgical Plant in Oskemen, Kazakhstan and will be under the responsibility of the appropriate authorities for safety, security and safeguards in Kazakhstan.

The IAEA LEU Bank will be a physical reserve of up to 90 metric tons of low enriched uranium suitable to make fuel for a typical light water reactor, the most widely used type of nuclear power reactor worldwide. The LEU can be used to make enough nuclear fuel to power a large city for three years.

LEU is the basic ingredient to fabricate nuclear fuel. It is made by enriching naturally occurring uranium to improve its ability to produce energy. Enrichment increases the concentration of atoms that can be split to produce heat. This heat in turn is used to generate electricity. The LEU that will be stored in the IAEA LEU Bank will have enrichment levels up to nominally 4.95%, suitable to make fuel for a typical light water reactor, the most widely used type of nuclear power reactor worldwide. LEU is safely stored and transported in strong steel cylinders.

LEU does not deteriorate and can be safely stored for many years. It is a white-grey, waxy solid during storage and transport. LEU is not nuclear waste, nor is any waste generated by simply storing it.

30. The ‘Women Entrepreneurship Platform’, a first of its kind, unified access portal which brings together women from different parts of India to realize their entrepreneurial aspirations, is an initiative of

(a) SIDBI (Small Industries Development Bank of India)
(b) Ministry of Women and Child Development
(c) FICCI (Federation of Indian Chambers of Commerce and Industry)
(d) NITI Aayog

**Solution: D**

The Women Entrepreneurship Platform (WEP)

- **NITI Aayog** has launched a Women Entrepreneurship Platform (WEP) for providing an ecosystem for budding & existing women entrepreneurs across the country. SIDBI has partnered with NITI Aayog to assist in this initiative.

As an enabling platform, WEP is built on three pillars- **Iccha Shakti, Gyaan Shakti & Karma Shakti**

1. **Iccha Shakti** represents motivating aspiring entrepreneurs to start their business.
2. **Gyaan Shakti** represents providing knowledge and ecosystem support to women entrepreneurs to help them foster entrepreneurship.

3. **Karma Shakti** represents providing hands-on support to entrepreneurs in setting-up and scaling up businesses.

31. Which of the following are nuclear weapon states under Non-Proliferation Treaty

   1. India
   2. China
   3. Russia
   4. Israel

   Select the correct answer using the code given below:
   (a) 1 and 2 only
   (b) 2 and 3 only
   (c) 3 and 4 only
   (d) 1 and 4 only

   **Solution: B**

**Non-Proliferation Treaty or NPT**

**What is NPT?**

- The NPT is a multilateral treaty aimed at limiting the spread of nuclear weapons including three elements: (1) non-proliferation, (2) disarmament, and (3) peaceful use of nuclear energy. These elements constitute a “grand bargain” between the five nuclear weapon states and the non-nuclear weapon states.

- The treaty was signed in 1968 and entered into force in 1970. Presently, it has 190 member states.

**Implications:**

- States without nuclear weapons will not acquire them.
- States with nuclear weapons will pursue disarmament.
- All states can access nuclear technology for peaceful purposes, under safeguards.

**Key provisions:**

- The Treaty defines **nuclear weapon states (NWS)** as those that had manufactured and detonated a nuclear explosive device prior to 1 January 1967. All the other states are therefore considered **non-nuclear weapon states (NNWS)**.
- The five nuclear weapon states are **China, France, Russia, the United Kingdom, and the United States.**

- The Treaty does not affect the right of state parties to develop, produce, and use nuclear energy for peaceful purposes.

**Role of states:**

- Nuclear weapon states are not to transfer to any recipient whatsoever nuclear weapons and not to assist, encourage, or induce any NNWS to manufacture or otherwise acquire them.

- Non-nuclear weapons states are not to receive nuclear weapons from any transferor, and are not to manufacture or acquire them.

- NNWS must accept the **International Atomic Energy Agency (IAEA)** safeguards on all nuclear materials on their territories or under their control

32. Which of the following tribes is/are present in Ladakh Region

1. Balti
2. Changpa
3. Purigpa

Select the correct answer using the code given below

(a) 1 and 2 only
(b) 2 only
(c) 2 and 3 only
(d) 1, 2 and 3

**Solution: D**

The total tribal population in **Ladakh region** is more than 97%. The region is inhabited by following **Scheduled Tribes**, namely:

- Balti
- Beda
- Bot, Boto
- Brokpa, Drokpa, Dard, Shin
- Changpa
- Garra
- Mon
- Purigpa

33. Treaty of Rarotonga formalizes a Nuclear-Weapon-Free Zone in

(a) South East Asia

(b) Africa
(c) South Pacific
(d) East Europe

Solution: C

The Treaty of Rarotonga is the common name for the South Pacific Nuclear Free Zone Treaty, which formalises a Nuclear-Weapon-Free Zone in the South Pacific. The treaty bans the use, testing, and possession of nuclear weapons within the borders of the zone.

It was signed by the South Pacific nations of Australia, the Cook Islands, Fiji, Kiribati, Nauru, New Zealand, Niue, Papua New Guinea, the Solomon Islands, Tonga, Tuvalu, Vanuatu and Western Samoa on the island of Rarotonga (where the capital of the Cook Islands is located) on 6 August 1985, came into force on 11 December 1986 with the 8th ratification, and has since been ratified by all of those states.

The Federated States of Micronesia, Marshall Islands, and Palau are not party to the treaties but are eligible to become parties should they decide to join the treaty in the future.

34. Consider the following statements regarding CORE CATCHER

1. Core catcher device is designed to localize and cool the molten core material in case of a Nuclear meltdown accident.
2. Molten core material, or corium, is lava-like material that gets formed in the core of a nuclear reactor in the event of a meltdown accident.
3. The core catcher is filled with a ceramic mixture also including ferric oxide and aluminum oxide, called sacrificial material.

Which of the statements given above is/are correct?

(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

Solution: D
CORE CATCHER

- The Moscow-based Rosatom State Corporation Engineering Division announced that it had installed a core melt localisation device (CMLD) or “core catcher” at Unit 3 of Tamil Nadu’s Kudankulam Nuclear Power Plant (KKNPP).

Corium:

- Molten core material, or corium, is lava-like material that gets formed in the core of a nuclear reactor in the event of a meltdown accident. The corium so formed can remain radioactive for several decades, even centuries.
- Such an accident occurs when the nuclear fission reaction taking place inside a reactor is not sufficiently cooled, and the buildup of heat causes fuel rods to melt down.
- In the past, meltdown accidents have occurred at Chernobyl in Russia in 1986 and at Fukushima in Japan in 2011.

Core Catcher:

- Core melt localisation device (CMLD) or a core catcher device is designed to localise and cool the molten core material in case of a meltdown accident.
- According to the Rosatom website, the core catcher is a cone shaped metal structure that weighs about 800 tonnes. The structure is double walled, with the gap between the two walls filled with FAOG (ferric and aluminium oxide granules).
- The core catcher is filled with a ceramic mixture also including ferric oxide and aluminium oxide, called ‘sacrificial material’. The sacrificial material prevents the corium from trickling through and also acts as a cooling mechanism.
- The core catcher device is installed at the bottom of the nuclear station’s protective shell, and is designed to save the latter as well as exude radioactive emission in the environment in case of a serious accident, according to the press release.

35. “The costs of De-carbonization” report is published by
   (a) United Nations Environment Programme
   (b) OECD
   (c) World Bank
   (d) United Nations Framework Convention on Climate Change

Solution: B

Under the Paris Agreement, OECD countries agreed to aim for a reduction of their greenhouse gas emissions sufficient to hold the increase in the global average temperature to well below 2°C above pre industrial levels.
This commitment requires a massive effort to **decarbonise energy and electricity generation**, a radical restructuring of the electric power sector and the rapid deployment of large amounts of low-carbon generation technologies, in particular nuclear energy and renewable energies such as wind and solar PV.

36. Consider the following statements regarding Belle-II

1. Belle-II experiment is designed to study violations of the Standard Model and dark matter.
2. Belle-II will indirectly probe new physics using intense electron-positron beams and a sensitive detector.

Which of the statements given above is/are correct?

(a) 1 only  
(b) 2 only  
(c) Both 1 and 2  
(d) Neither 1 nor 2

**Solution: C**

- **Belle-II 'rolls in' to collision point**
- The **High Energy Accelerator Research Organisation (KEK)** has completed the much-awaited 'rolling-in' of the Belle-II experiment in Tsukuba, Japan.

**About the experiment:**

- Belle II is an upgraded detector to allow the experiment to record the enormous numbers of particle processes that are produced by the Super KEKB accelerator.
- This experiment is designed to study violations of the Standard Model and dark matter.
- The Belle II experiment will accumulate 50 times more data than the previous experiment, Belle, and pursue violations of the symmetry between particles and anti-particles as well as new laws of physics. It is a grand collaboration of 700 scientists from 23 countries.
- Complementary to the direct search experiments being carried out at the **Large Hadron Collider in CERN**, Belle-II will indirectly probe new physics using intense electron-positron beams and a sensitive detector.

**Contributions from India:**

- Belle-II has a significant Indian participation both on experimental and theoretical sides.
The fourth layer of the six-layer, highly sensitive particle detector, which is at the heart of Belle-II, has been built by Indian scientists.

Scientists from the Indian Institutes of Technology (IITs) in Bhubaneswar, Chennai, Guwahati and Hyderabad; the Institute of Mathematical Sciences (IMSc), Chennai; Punjab University; Punjab Agricultural University; MNIT (Malaviya National Institute of Technology), Jaipur; IISER (Indian Institutes of Science Education and Research) Mohali; and TIFR, Mumbai, are participating in this research.

37. Consider the following statements regarding virosome

1. Virosomes are enveloped virus like particles.
2. They are lipid-based carriers (envelopes) containing the functional fusion viral proteins and natural membrane proteins of the natural virus.
3. Virosomes based vaccines are designed to maintain the immunogenicity of a live-attenuated virus but with the safety of a killed virus.

Which of the statements given above is/are correct?

(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

**Solution: D**

What is a virosome?

- **Virosomes** are enveloped virus like particles.
- They are lipid-based carriers (envelopes) containing the functional fusion viral proteins and natural membrane proteins of the natural virus.
- These lipid-based viral envelopes can be combined with additional rationally designed antigens and adjuvants for each specific's vaccine or immunotherapies.
- Virosomes based vaccines are designed to maintain the immunogenicity of a live-attenuated virus but with the safety of a killed virus.
- The virosomes are devoid of the nucleocapsid and without the genetic material of the source virus, they are unable to replicate, cause an infection or a disease.

38. Consider the following statements regarding The International Conference on Nano Science and Nano Technology (ICONSAT)

1. It is organized annually under the aegis of Nano Mission.
2. It aims to bring to fore the recent advances in the area of nano science and technology.

3. Nano Mission Council is chaired by Minister of Science and Technology.

Which of the statements given above is/are correct?

(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

Solution: A

ICONSAT (International Conference on Nano Science and Technology) is the series of biennial International Conference held in India under the aegis of Nano Mission, Department of Science and Technology, Government of India, to bring to fore the recent advances in the area of nano science and technology. The conferences of the series have earlier been hosted by premier institutes, IISER-Pune (2016), INST Mohali (2014), ARCI Hyderabad (2012), IIT Bombay (2010), IGCAR Kalpakkam (2008), IIT Delhi (2006) and SINP Kolkata (2003).

The International Conference on Nano Science and Nano Technology (ICONSAT) under the aegis of Nano Mission, Department of Science and Technology (DST) is being held at Kolkata focusing on the recent advances in this frontier research field.

Mission on Nano Science and Technology (Nano Mission):

- It is as an “umbrella capacity-building programme”.
- The Mission’s programmes will target all scientists, institutions and industry in the country.
- It will also strengthen activities in nano science and technology by promoting basic research, human resource development, research infrastructure development, international collaborations, among others.
- It will be anchored in the Department of Science and Technology and steered by a Nano Mission Council chaired by an eminent scientist.

Outcomes and significance of the mission:

- As a result of the efforts led by the Nano Mission, today, India is amongst the top five nations in the world in terms of scientific publications in nano science and technology (moving from 4th to the 3rd position).
- The Nano Mission itself has resulted in about 5000 research papers and about 900 Ph.Ds and also some useful products like nano hydrogel based eye drops, pesticide
removal technology for drinking water, water filters for arsenic and fluoride removal, nanosilver based antimicrobial textile coating, etc.

- The Nano Mission has thus helped establish a good eco-system in the country to pursue front-ranking basic research and also to seed and nurture application-oriented R&D, focused on useful technologies and products.

39. Consider the following statements
   1. India Justice Report (IJR) has been released by Bar Council of India.
   2. It is India’s first-ever ranking of states on justice delivery.

Which of the statements given above is/are correct?
   (a) 1 only
   (b) 2 only
   (c) Both 1 and 2
   (d) Neither 1 nor 2

*Solution: B*

**India Justice Report (IJR)** has been prepared by **Tata Trusts** in collaboration with Centre for social Justice, Common Cause, Commonwealth Human Rights Initiative, Daksh, TISS-Prayas and Vidhi Centre for Legal Policy.

It is **India’s first-ever ranking of states on justice delivery**.

40. Consider the following statements regarding Kumbh Mela
   1. It is the largest religious gathering in the world.
   2. The mela is held on a rotational basis at four auspicious Hindu pilgrimage sites.
   3. T. Narasipura is one of the four auspicious place where Kumbh Mela is held

Which of the statements given above is/are correct?
   (a) 1 only
   (b) 2 only
   (c) 1 and 2 only
   (d) 1, 2 and 3

*Solution: C*
The **Kumbh Mela** is the **largest religious gathering in the world**. Every day millions of people come to take a dip in the holy river.

- The mela (gathering) is held on a rotational basis at four auspicious Hindu pilgrimage sites- Allahabad, Haridwar, Nashik-Trimbak and Ujjain.
- The mela is held once in three years at different places and at any given place after a time interval of twelve years. The exact dates are determined according to the zodiac positions of the Sun, Moon and the planet Jupiter. At Nashik and Ujjain, if the mela is held when a planet is in Leo (Simha in Hindu astrology), it is called as Simhastha Kumbh.
- At Haridwar and Allahabad, Ardh-Kumbh Mela is held every sixth year and a Maha Kumbh takes place once in 144 years.

41. Consider the following statements regarding Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
   1. It aims to regulate worldwide commercial trade in wild animal and plant species
   2. It is administered by the United Nations Environment Programme (UNEP).
   3. It is not legally binding on the Parties.

Which of the pairs given above is/are correctly matched?
   (a) 1 and 2 only
   (b) 2 and 3 only
   (c) 3 and 4 only
   (d) 1 and 4 only

**Solution: A**

**Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES):**

- It is an International agreement to regulate worldwide commercial trade in wild animal and plant species. It also restricts trade in items made from such plants and animals, such as food, clothing, medicine, and souvenirs
- It was signed on March 3, 1973 (Hence world wildlife day is celebrated on March 3).
- It is administered by the United Nations Environment Programme (UNEP).
- Secretariat — **Geneva** (Switzerland).
- CITES is legally binding on state parties to the convention, which are obliged to adopt their own domestic legislation to implement its goals.
Classifications:

It classifies plants and animals according to three categories, or appendices, based on how threatened. They are.

- **Appendix I**: It lists species that are in danger of extinction. It prohibits commercial trade of these plants and animals except in extraordinary situations for scientific or educational reasons.

- **Appendix II species**: They are those that are not threatened with extinction but that might suffer a serious decline in number if trade is not restricted. Their trade is regulated by permit.

- **Appendix III species**: They are protected in at least one country that is a CITES member states and that has petitioned others for help in controlling international trade in that species.

42. Anshupa Lake is recently seen in the news, located in

(a) Karnataka
(b) Odisha
(c) Assam
(d) Maharashtra

**Solution: B**

**Ansupa Lake** is a horseshoe shaped fresh water lake on the left bank of the **Mahanadi river**, opposite Banki in Cuttack district, Odisha, India. Ansupa Lake in Banki is 40 km from the city of Cuttack, which also acts as a **shelter for the migratory birds in the wintry weather season**.

43. Consider the following statements regarding Administrative Tribunal

1. It is a quasi-judicial body
2. Two or more states can also agree for a single tribunal.
3. Tribunal orders can be challenged only before the supreme Court

Which of the statements given above is/are correct?

(a) 1 and 3 only
(b) 2 and 3 only
(c) 1 and 2 only
(d) 1, 2 and 3
Solution: C

Administrative Tribunal:

- The tribunal is a quasi-judicial body
- **Article 323-A**, which came by way of the 42nd constitutional amendment in 1976, enabled the Centre to enact The Administrative Tribunals Act, 1985 for setting-up the Tribunals for adjudication over “disputes and complaints with respect to recruitment and conditions of service of persons”.
- The Centre under the Act can establish the Tribunal for its own employees and also has the power to establish one for a state after receiving a request from the state government.
- Two or more states can also agree for a single tribunal.
- Tribunal orders can be challenged before the High Court.

44. Consider the following statements regarding Composite Water Management Index

1. It has been released by Ministry of Jal Shakti
2. It aims to enable effective water management in Indian states in the face of this growing crisis.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: B

Composite Water Management Index (CWMI):

- **NITI Aayog** has released its report on Composite Water Management Index (CWMI).
- The Composite Water Management Index report is a step in a direction that aims to create awareness among people and governments about the realities of water crisis in the country.
- CWMI aims to enable effective water management in Indian states in the face of this growing crisis.
• The index would provide useful information for the states and concerned Central ministries and departments enabling them to formulate and implement suitable strategies for better management of water resources.

• NITI Aayog has ranked all states in the index on the composite water management, comprising 9 broad sectors with 28 different indicators covering various aspects of ground water, restoration of water bodies, irrigation, farm practices, drinking water, policy and governance.

Key performers:

• Gujarat is ranked one in the reference year (2017-18).

• It is followed by Andhra Pradesh, Madhya Pradesh, Goa, Karnataka and Tamil Nadu.

• In North Eastern and Himalayan States, Himachal Pradesh has been adjudged number 1 in 2017-18 followed by Uttarakhand, Tripura and Assam.

• The Union Territories have first time submitted their data and Puducherry has been declared as the top ranker.

• In terms of incremental change in index (over 2016-17 level), Haryana holds number one position in general States and Uttarakhand ranks at first position amongst North Eastern and Himalayan States.

• On an average, 80% of the states assessed on the Index over the last three years have improved their water management scores, with an average improvement of +5.2 points.

45. Which of the followings are the key result areas under SANKALP scheme?

1. Institutional Strengthening (at National, State & District level)

2. Quality Assurance Quality Assurance of skill development programs

3. Inclusion of marginalized population in skill development

4. Expanding Skills through Public Private Partnerships (PPPs).

Select the correct answer using the code given below:

(a) 1, 2 and 3 only

(b) 2, 3 and 4 only

(c) 1, 3 and 4 only

(d) 1, 2, 3 and 4

Solution: D
SANKALP scheme:

- SANKALP is a centrally sponsored scheme of Ministry of Skill Development & Entrepreneurship (MSDE). It is an outcome focused scheme marking shift in government’s implementation strategy in vocational education and training from inputs to results. SANKALP aims to implement the mandate of the National Skill Development Mission (NSDM).
- SANKALP will provide market relevant training to 3.5 crore youth.
- **Objective:** The Objective of the project is to enhance institutional mechanisms for skills development and increase access to quality and market-relevant training for the work force.
- The scheme provides the required impetus to the National Skill Development Mission, 2015 and its various sub missions. It is aligned to flagship Government of India programs such as Make in India and Swachhta Abhiyan and aims at developing globally competitive workforce for domestic and overseas requirements.
- Under SANKALP four key result areas have been identified viz: (i) Institutional Strengthening (at National, State & District level); (ii) Quality Assurance Quality Assurance of skill development programs; (iii) Inclusion of marginalised population in skill development; and (iv) Expanding Skills through Public Private Partnerships (PPPs).

46. Consider the following statements regarding Khadi & Village Industries Commission (KVIC)

1. It is a statutory body
2. It is an apex organization under the aegis of Ministry of Skill Development and Entrepreneurship.
3. It aims to plan, promote, facilitate, organise and assist in the establishment and development of khadi and village industries in the rural areas.

Which of the statements given above is/are correct?

(a) 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3 only

*Solution: B*
Khadi & Village Industries Commission (KVIC):

- The Khadi and Village Industries Commission (KVIC) is a statutory body established by an Act of Parliament (Khadi and Village Industries Commission Act of 1956). In April 1957, it took over the work of former All India Khadi and Village Industries Board.

- Functions: It is an apex organization under the Ministry of Micro, Small and Medium Enterprises, with regard to khadi and village industries within India, which seeks to—“plan, promote, facilitate, organise and assist in the establishment and development of khadi and village industries in the rural areas in coordination with other agencies engaged in rural development wherever necessary.”

The Commission has three main objectives which guide its functioning. These are:

- The Social Objective – Providing employment in rural areas.
- The Economic Objective – Providing salable articles.
- The Wider Objective – Creating self-reliance amongst people and building up a strong rural community spirit.

47. Consider the following statements regarding Chief of Defence Staff

1. CDS will function as the military advisor to the PM-led Nuclear Command Authority
2. CDS will be member of Defence Acquisition Council and Defence Planning Committee

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: C

Chief of Defence Staff

- He will be the single-point military adviser to the government as suggested by the Kargil Review Committee in 1999.

- CDS oversees and coordinates the working of the three Services.

Conditions:

- He will be a Four-star General.
• Not eligible to hold any Government office after demitting the office of CDS.
• No private employment without prior approval for a period of five years after demitting the office of CDS.

Roles and functions:
• CDS will provide “single-point military advice” to the government, inject synergy in planning, procurements and logistics in the armed forces.
• It will ensure integration of land-air-sea operations through the eventual setting up of theatre commands.
• The CDS will also function as the military advisor to the PM-led Nuclear Command Authority, as also have direct command of tri-Service organizations to handle the new warfare domains of space and cyberspace.
• He will function as the Principal Military Adviser to the Defence Minister and also as the Permanent Chairman, Chiefs of Staff Committee (COSC).
• The CDS will be member of Defence Acquisition Council and Defence Planning Committee.

48. Consider the following statements regarding English Channel
   1. It is a part of the Atlantic Ocean.
   2. It separates the island of Britain from northern France.

Which of the statements given above is/are correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: C

English Channel:
• French inventor crosses the English Channel on his hoverboard.
• The English Channel is a part of the Atlantic Ocean.
• It separates the island of Britain (part of the UK) from northern France and joins the North Sea to the Atlantic Ocean.
• It’s approximately 350 miles long, and at its narrowest in the Strait of Dover.
49. Which of the followings are Components of RBI’s capital reserve?

1. Contingency Fund
2. Asset Development Fund
3. Currency and Gold Revaluation Account
4. Investment Revaluation Account
5. Foreign Exchange Forward Contracts Valuation Account.

Select the correct answer using the code given below:

(a) 1, 2 and 3 only
(b) 1, 2 and 4 only
(c) 1, 2 and 5 only
(d) 1, 2, 3, 4 and 5

Solution: D
Capital Reserve:

- The main purpose of the capital reserve is to enable the RBI to meet any financial emergency situation out of liquidity crisis etc., – on its own. Capital actually indicate the ready funds available with the RBI to manage own business. The RBI can consider this as a financial capacity while delivering some action like liquidity injection. When your purse is big or assets are strong, your readiness to provide funds during a crisis also will be big.

- **Liquidity emergencies** like the **Global Financial Crisis**, IL&FS liquidity situation etc. points towards the strengthening of such a reserve to manage contingencies.

Components of the capital reserve:

- There are five components in the RBI’s capital reserve. The first two (CF and ADF) are Funds created to meet specific purposes and provisions are made yearly to add money to these funds.

- The other three (CGRA, IRA and FCVA) are valuation accounts just shows the gain or losses in foreign exchange, government securities or foreign currency contracts handled by the RBI.

**Following are the five components of the RBI’s capital reserve.**

1. Contingency Fund (CF)
2. Asset Development Fund (ADF)
3. Currency and Gold Revaluation Account (CGRA)
4. Investment Revaluation Account (IRA) and
5. Foreign Exchange Forward Contracts Valuation Account (FCVA).

All these five components are recorded in the liability side of the RBI’s balance sheet.

50. **National Productivity Council (NPC) has been established by**

   (a) NITI Aayog  
   (b) Ministry of Skill Development and Entrepreneurship  
   (c) Ministry of Commerce and Industry  
   (d) Ministry of Agriculture & Farmers’ Welfare

*Solution: C*

National Productivity Council (NPC):

- NPC is national level organization to promote productivity culture in India.
• Established by the Ministry of Industry, Government of India in 1958.

• It is an autonomous, multipartite, non-profit organization with equal representation from employers’ & workers’ organizations and Government, apart from technical & professional institutions and other interests.

• NPC is a constituent of the Tokyo-based Asian Productivity Organisation (APO), an Inter-Governmental Body, of which the Government of India is a founder member.

Functions: NPC teams up with its clients to work out solutions towards accelerating productivity, enhancing competitiveness, increasing profits, augmenting safety and reliability and ensuring better quality. It provides reliable database for decision-making, improved systems and procedures, work culture as well as customer satisfaction both internal & external.

DAY – 23

51. Consider the following statements regarding Habitat and Environment

1. A habitat always has life in it, whereas the environment does not necessarily have life in it.

2. All habitats are environments, but all environments are not habitats.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

Solution: C

Difference between Habitat and Environment

• A habitat always has life in it, whereas the environment does not necessarily have life in it.

• All habitats are environments, but all environments are not habitats.

• A habitat is always a preference of one species.

• An environment could be a preference of many species that could eventually become many habitats.

• Usually, the environment governs the properties of a habitat, but not vice versa.
52. Consider the following statements regarding Ecological Succession

1. When succession is brought about by living inhabitants of that community itself, the process is called autotrophic succession.

2. While change brought about by outside forces is known as heterotrophic succession.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: D

Autogenic and Allogenic Succession

- When succession is brought about by living inhabitants of that community itself, the process is called autogenic succession, while change brought about by outside forces is known as allogenic succession.

- Autogenic succession is driven by the biotic components of an ecosystem.

- Allogenic succession is driven by the abiotic components (fire, flood) of the ecosystem.

Autotrophic and Heterotrophic succession

- Succession in which, initially the green plants are much greater in quantity is known as autotrophic succession; and the ones in which the heterotrophs are greater in quantity is known as heterotrophic succession.

53. Consider the following statements regarding Rashtriya Mahila Kosh

1. It is an autonomous body under the Ministry of Women & Child Development for socio-economic empowerment of women.

2. RMK extends micro-credit to the women in the informal sector through a client friendly, without collateral and in a hassle-free manner for income generation activities.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2
Solution: C

Rashtriya Mahila Kosh (RMK) established in 1991 is an autonomous body under the Ministry of Women & Child Development for socio-economic empowerment of women.

- RMK extends micro-credit to the women in the informal sector through a client friendly, without collateral and in a hassle-free manner for income generation activities.

- It was registered under the Societies Registration Act 1860. The operating model currently followed by RMK is that of a facilitating agency wherein RMK provides loans to NGO-MFIs termed as Intermediary Organizations (IMO) which on-lend to Self Help Groups (SHGs) of women.

https://rmk.nic.in/welcome-rashtriya-mahila-kosh

54. Consider the following statements regarding the Energy Flow through an Ecosystem

1. A trophic level is the representation of energy flow in an ecosystem.
2. Energy flows through the trophic levels from producers to subsequent trophic levels is bidirectional.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: A

Energy Flow through an Ecosystem – Trophic Levels

(Trophe = Nourishment)

- A trophic level is the representation of energy flow in an ecosystem.
- The trophic level of an organism is the position it occupies in a food chain.
- Trophic level interaction deals with how the members of an ecosystem are connected based on nutritional needs.

Energy flows through the trophic levels from producers to subsequent trophic levels is unidirectional.
Energy level decreases from the first trophic level upwards due to **loss of energy in the form of heat at each trophic level**.

This energy loss at each trophic level is quite significant. Hence there are usually not more than four-five trophic levels (beyond this the energy available is negligible to support an organism).

**55.** Consider the following statements regarding Export Credit Guarantee Corporation (ECGC)

1. ECGC Limited is a company which provides export credit insurance support to Indian exporters against losses due to non-payment of export dues.
2. It excludes political risk in non-payment of dues.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

**Solution: A**

The **ECGC Limited** is a company which **provides export credit insurance support** to Indian exporters against losses due to non-payment of export dues by overseas buyers due to political and / or commercial risks.

ECGC provides (i) a range of insurance covers to Indian exporters against the risk of non-realization of export proceeds due to commercial or political risks (ii) different types of credit insurance covers to banks and other financial institutions to enable them to extend credit facilities to exporters and (iii) Export Factoring facility for MSME sector which is a package of financial products consisting of working capital financing, credit risk protection, maintenance of sales ledger and collection of export receivables from the buyer located in overseas country.

https://commerce.gov.in/InnerContent.aspx?id=228

**56.** Consider the following statements regarding the concept of food chain

1. In an aquatic ecosystem, the grazing food chain is the major conduit for energy flow.
2. In a terrestrial ecosystem, a much larger fraction of energy flows through the detritus food chain than through the grazing food chain.

Which of the statements given above is/are correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

**Solution:** C

**Grazing food chain**
- The consumers which start the food chain, utilising the plant or plant part as their food, constitute the grazing food chain.
- For example, in a terrestrial ecosystem, the grass is eaten by a caterpillar, which is eaten by lizard and lizard is eaten by a snake.
- In Aquatic ecosystem phytoplankton (primary producers) are eaten by zooplanktons which are eaten by fishes and fishes are eaten by pelicans.

**Detritus food chain**
- This type of food chain starts from organic matter of dead and decaying animals and plant bodies from the grazing food chain.
- Dead organic matter or detritus feeding organisms are called detrivores or decomposers.
- The detrivores are eaten by predators.
- In an aquatic ecosystem, the grazing food chain is the major conduit for energy flow.
- As against this, in a terrestrial ecosystem, a much larger fraction of energy flows through the detritus food chain than through the grazing food chain.

57. Consider the following statements regarding the limitations of Ecological Pyramids
   1. It does not consider the same species belonging to two or more trophic levels.
   2. It assumes a simple food chain, something that seldom exists in nature.
   3. Saprophytes are not given any place in ecological pyramids.
Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3
Limitations of Ecological Pyramids

- It does not consider the same species belonging to two or more trophic levels.
- It assumes a simple food chain, something that seldom exists in nature; it does not accommodate a food web.
- Moreover, saprophytes (plant, fungus, or microorganism that lives on decaying matter) are not given any place in ecological pyramids even though they play a vital role in the ecosystem.

58. Which of the following entities is/are considered as Service Voters by Election Commission of India?

1. Those who serving in the Armed Forces of the Union.
2. Those who serving in CRPF, BSF and ITBP etc. to which the Army Act 1950 applies.
3. Those who employed under the Government of India, in a post outside India

Which of the statements given above is/are correct?

(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Solution: D

Who is a Service Voter?

According to the provisions of sub-section (8) of Section 20 of Representation of People Act, 1950, Service Voters are

- Those serving in the Armed Forces of the Union.
- Those serving in a Force to which the Army Act 1950 applies (Assam rifles, CRPF, BSF, ITBP,
- SSB, NSG, GREF in BRO (Border Road organisation), CISF etc.
- Member of an Armed Police Force of a State, serving outside that state.
- Those employed under the Government of India, in a post outside India
59. Which of the following are free-living nitrogen fixing bacteria?

1. Azotobacter
2. Beijemickia
3. Clostridium
4. Rhodospirillum

Select the correct answer using the code given below:

(a) 1, 2 and 3 only
(b) 1, 3 and 4 only
(c) 1, 2 and 4 only
(d) 1, 2, 3 and 4

**Solution: D**

The enzyme, nitrogenase which is capable of nitrogen reduction is present exclusively in **prokaryotes**. Such microbes are called **N2-fixers**. These include:

- free-living nitrogen fixing bacteria (non-symbiotic nitrogen-fixing bacteria or nitrogen-fixing soil bacteria) (e.g. **aerobic Azotobacter** and **Beijemickia**; **anaerobic Clostridium** and **Rhodospirillum**),
- symbiotic nitrogen-fixing bacteria (e.g. **Rhizobium**) living in association with leguminous plants and non-leguminous root nodule plants and
- some cyanobacteria (a major source of nitrogen fixation in oceans) (**blue-green algae**. E.g. **Nostoc, Anabaena, Spirulina**).

60. Consider the following statements regarding Multidimensional Poverty Index

1. The MPI assesses poverty at the individual level.
2. It is an international measure of acute poverty covering over 100 developing countries.
3. It was developed by World Bank

Which of the statements given above is/are correct?

(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3
Solution: A

Multidimensional Poverty Index

- Multidimensional Poverty Index (MPI) is an international measure of acute poverty covering over 100 developing countries. It was developed in 2010 by the Oxford Poverty & Human Development Initiative (OPHI) and the United Nations Development Programme.

- The MPI assesses poverty at the individual level. If someone is deprived in a third or more of ten (weighted) indicators, the global index identifies them as ‘MPI poor’, and the extent or intensity of their poverty is measured by the number of deprivations they are experiencing.

https://ophi.org.uk/multidimensional-poverty-index/

61. Consider the following statements regarding the Lagoon and the Estuary

1. Lagoons are formed due to falling in sea levels whereas estuaries are mostly formed due to rise in sea levels.

2. In estuaries, the water flows fast and strong, while in lagoons the water is shallower and flows sluggishly.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: C

Differences between Lagoon and Estuary

- A lagoon is a stretch of salt water separated from the sea by a low sandbank or coral reef.

- Backwaters in Kerala are mostly lagoons where seawater flows inwards through a small inlet that is open towards the sea.

- In estuaries, the water flows fast and strong, while in lagoons the water is shallower and flows sluggishly.

- Estuaries are usually deeper than lagoons. Also, lagoons mostly don’t have any fresh water source while the estuaries have at least one. Lagoons are more saline than estuaries.
Lagoons are formed due to falling in sea levels (coastline of emergence. E.g. Kerala Coast) whereas estuaries are mostly formed due to rise in sea levels (coastline of submergence. E.g. Konkan coast)

62. Consider the following statements regarding the Species diversity

1. It is the ratio of one species population over total number of organisms across all species in the given biome.
2. ‘One’ would be infinite diversity, and ‘zero’ represents only one species present.
3. In general, species diversity decreases as we move away from the equator towards the poles.

Which of the statements given above is/are correct?

(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

Solution: B

Species diversity

- It is the ratio of one species population over total number of organisms across all species in the given biome. ‘Zero’ would be infinite diversity, and ‘one’ represents only one species present.

- Species diversity is a measure of the diversity within an ecological community that incorporates both species richness (the number of species in a community) and the evenness of species.

- In general, species diversity decreases as we move away from the equator towards the poles.

- With very few exceptions, tropics (latitudinal range of 23.5° N to 23.5° S) harbour more species than temperate or polar areas.

Bioprospecting: nations endowed with rich biodiversity explore molecular, genetic and species-level diversity to derive products of economic importance.

63. Consider the following statements

1. Olive Ridley Turtles are largely found in Gahirmatha Marine Sanctuary
2. Gharial are largely found in Chilka Lake
Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: A

- National Chambal Sanctuary, also called the National Chambal Gharial Wildlife Sanctuary, is a 5,400 km² tri-state protected area in northern India for the protection of the Critically Endangered gharial, the red-crowned roof turtle and the Endangered Ganges river dolphin.

- Gahirmatha Marine Sanctuary is a marine wildlife sanctuary located in Odisha and is a very popular tourist attraction of Odisha in India. It is the world's largest nesting beach for Olive Ridley Turtles. It extends from Dhamra River mouth in the north to Brahmani river mouth in the south.

64. Consider the following statements regarding the Keystone species

1. Keystone species is a dominant primary producer in an ecosystem both in terms of abundance and influence.
2. If keystone species is lost, it will result in the degradation of the whole ecosystem.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: B

Foundation species

- Foundation species is a dominant primary producer in an ecosystem both in terms of abundance and influence. Example: kelp in kelp forests and corals in coral reefs.
Keystone species

- Keystone species is a species whose addition to or loss from an ecosystem leads to major changes in the occurrence of at least one other species.
- Certain species in an ecosystem is considered more important in determining the presence of many other species in that ecosystem.
- **All top predators** (Tiger, Lion, Crocodile etc) are considered as keystone species because they regulate all other animal population indirectly.
- Hence top predators are given much consideration in conservation.
- If keystone species is **lost**, it will result in the **degradation of the whole ecosystem**.
- For example, certain plant species (ebony tree, Indian-laurel) exclusively depends upon bats for its pollination. If the bat population is reduced, then regeneration of particular plants becomes more difficult.

**65.** Consider the following statements regarding PRAGATI

1. It has been launched by Ministry of Electronics and Information Technology
2. It aims to addressing common man’s grievances, and simultaneously monitoring and reviewing important programmes and projects of the Government of India as well as projects flagged by State Governments.
3. It is a three-tier system.

Which of the statements given above is/are correct?

(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

*Solution: B*

**PRAGATI:**

- PRAGATI (Pro-Active Governance And Timely Implementation) is a unique integrating and interactive platform.
- The platform is aimed at addressing common man's grievances, and simultaneously monitoring and reviewing important programmes and projects of the Government of India as well as projects flagged by State Governments.
- It was developed jointly by Prime Minister’s office (PMO) and National Informatics Centre (NIC) and was launched in 2015.
Unique features:

- The PRAGATI platform uniquely bundles three latest technologies: Digital data management, video-conferencing and geo-spatial technology.

- It also offers a unique combination in the direction of cooperative federalism since it brings on one stage the Secretaries of Government of India and the Chief Secretaries of the States.

- With this, the Prime Minister is able to discuss the issues with the concerned Central and State officials with full information and latest visuals of the ground level situation. It is also an innovative project in e-governance and good governance.

- It is a three-tier system (PMO, Union Government Secretaries, and Chief Secretaries of the States).

- Issues to be flagged before the PM are picked up from the available database regarding Public Grievances, on-going Programmes and pending Projects.

66. Consider the following statements regarding Realms

1. Biogeographic realms are large spatial regions within which ecosystems share a broadly similar biota.

2. A realm is a continent or sub-continent sized area with unifying features of geography and fauna & flora.

3. The Indian region is composed of five realms.

Which of the statements given above is/are correct?

(a) 1 and 2 only

(b) 1 and 3 only

(c) 2 and 3 only

(d) 1, 2 and 3

Solution: A

Realms

- **Biogeographic realms** are large spatial regions within which ecosystems share a broadly similar biota.

- A **realm is a continent or sub-continent sized area** with unifying features of geography and fauna & flora.
The Indian region is composed of two realms. They are:

- the Himalayan region represented by Palearctic Realm and
- the rest of the sub-continent represented by Malayan Realm

67. Which of the following organizations releases the ‘Global biodiversity Outlook’?
   (a) United Nations Environment Programme (UNEP)
   (b) Convention on Biological Diversity (CBD)
   (c) International Union for Conservation of Nature (IUCN)
   (d) International Institute for Environment and Development (MED)

**Solution: B**

Global Biodiversity Outlook (GBO) is the flagship publication of the Convention on Biological Diversity. It is a periodic report that summarizes the latest data on the status and trends of biodiversity and draws conclusions relevant to the further implementation of the Convention.

https://www.cbd.int/gbo/

68. Consider the following statements regarding Hunar Haat
   1. It has been organized by Ministry of Culture.
   2. It is an exhibition of handicrafts and traditional products made by artisans from the minority communities.

Which of the statements given above is/are correct?
   (a) 1 only
   (b) 2 only
   (c) Both 1 and 2
   (d) Neither 1 nor 2

**Solution: B**

Hunar Haat:

- Organized by ministry of minority affairs under “USTTAD” scheme at different parts of the country. It is an exhibition of handicrafts and traditional products made by artisans from the minority communities. These Haat aim to provide market
exposure and employment opportunities to artisans, craftsmen and traditional culinary experts.

Significance:

- “Hunar Haat” have become a successful mission to provide employment and employment opportunities and national as well international markets for thousands of master artisans, craftsmen and culinary experts.

69. Which of the following regions areas is/are known for Mangrove vegetation in India?

1. Gulf of Kutch
2. Sunderbans
3. Andaman and Nicobar Islands

Select the correct answer using the code given below:

(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 only
(d) 1, 2 and 3

Solution: D

Mangroves are salt-tolerant plants of tropical and subtropical intertidal regions of the world. The specific regions where these plants occur are termed as ‘mangrove ecosystem’. These are highly productive but extremely sensitive and fragile. Besides mangroves, the ecosystem also harbours other plant and animal species.

Experiences have proved that the presence of mangrove ecosystems on coastline save lives and property during natural hazards such as cyclones, storm surges and erosion. These ecosystems are also well known for their economic importance. They are breeding, feeding and nursery grounds for many estuarine and marine organisms. Hence, these areas are used for captive and culture fisheries. The ecosystem has a very large unexplored potential for natural products useful for medicinal purposes and also for salt production, apiculture, fuel and fodder, etc.

The distribution of mangrove ecosystem on Indian coastlines indicates that the Sundarban mangroves occupy very large area followed by Andaman-Nicobar Islands and Gulf of Kutch in Gujarat.

Rest of the mangrove ecosystems is comparatively smaller.
70. Consider the following statements regarding Zonal Councils

1. These are established under the States Reorganization Act 1956
2. They are only deliberative and advisory bodies.
3. It aims to promote interstate cooperation and coordination.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Solution: D

Zonal councils:

- **Statutory bodies** established under the States Reorganization Act 1956 and not constitutional bodies. They are only deliberative and advisory bodies.
Aim: to promote interstate cooperation and coordination.

There are 5 five Zonal councils namely:


2. The **Central Zonal Council**, comprising the States of Chhattisgarh, Uttarakhand, Uttar Pradesh and Madhya Pradesh.

3. The **Eastern Zonal Council**, comprising the States of Bihar, Jharkhand, Orissa, and West Bengal.

4. The **Western Zonal Council**, comprising the States of Goa, Gujarat, Maharashtra and the Union Territories of Daman & Diu and Dadra & Nagar Haveli.

5. The **Southern Zonal Council**, comprising the States of Andhra Pradesh, Telangana, Karnataka, Kerala, Tamil Nadu and the Union Territory of Puducherry.

The North Eastern States i.e. (i) Assam (ii) Arunachal Pradesh (iii) Manipur (iv) Tripura (v) Mizoram (vi) Meghalaya (vii) Sikkim and (viii) Nagaland are not included in the Zonal Councils and their special problems are looked after by the **North Eastern Council**, set up under the **North Eastern Council Act, 1972**.

Composition:

- **Chairman** – The **Union Home Minister** is the Chairman of each of these Councils.

- **Vice Chairman** – The **Chief Ministers of the States** included in each zone act as Vice-Chairman of the Zonal Council for that zone by rotation, each holding office for a period of one year at a time.

- **Members** – Chief Minister and two other Ministers as nominated by the Governor from each of the States and two members from Union Territories included in the zone.

- **Advisers** – One person nominated by the Planning Commission (which has been replaced by NITI Ayog now) for each of the Zonal Councils, Chief Secretaries and another officer/Development Commissioner nominated by each of the States included in the Zone.

- **Union Ministers are also invited** to participate in the meetings of Zonal Councils depending upon necessity.

The main objectives of setting up of Zonal Councils are:

- Bringing out **national integration**.

- Arresting the growth of acute State consciousness, regionalism, linguism and particularistic tendencies.
- Enabling the **Centre and the States to co-operate** and exchange ideas and experiences.
- Establishing a **climate of co-operation amongst the States** for successful and speedy execution of development projects.

71. Which of the following is/are the characteristics that the pollutant should possess in order for bio magnification to occur?

1. A pollutant should be short lived.
2. A pollutant should be biologically active.
3. A pollutant should be soluble in water.

Select the correct answer using the code given below:

(a) 1 only  
(b) 2 only  
(c) 2 and 3 only  
(d) 1, 2 and 3

**Solution: B**

**Biomagnification** stands for **Biological Magnification**, which means the increase of contaminated substances or toxic chemicals that take place in the **food chains**. These substances often arise from intoxicated or contaminated environments.

- The contaminants include heavy metals namely mercury, arsenic, pesticides such as DDT, and polychlorinated biphenyls (PCBs) compounds which are then taken up by organisms because of the food they consume or the intoxication of their environment.
- Pollutant needs to satisfy characteristics like long life, mobile, biologically active, soluble in fat to make biomagnification possible.
- If a pollutant is short-lived, it will be broken down before it can become dangerous. If it is not mobile, it will stay in one place and is unlikely to be taken up by organisms. If the pollutant is soluble in water, it will be excreted by the organism. Pollutants that dissolve in fats, however, may be retained for a long time.

72. With reference to the ‘Ecological Niche’, consider the following statements:

1. Niche plays an important role in conservation of organisms.
2. No two species have exact identical niches.

Which of the statements given above is/are correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: C

A niche is the unique functional role or place of a species in an ecosystem. It is a description of all the biological, physical and chemical factors that a species needs to survive, stay healthy and reproduce.

- A niche is unique for a species, which means no two species have exact identical niches. Niche plays an important role in conservation of organisms. If we have to conserve species in its native habitat we should have knowledge about the niche requirements of the species and should ensure that all requirements of its niche are fulfilled.

Types of Niche

1. Habitat niche – where it lives
2. Food niche – what it eats or decomposes & what species it competes with
3. Reproductive niche – how and when it reproduces.
4. Physical & chemical niche – temperature, land shape, land slope, humidity & other requirement.

Consider the following pairs regarding GI tag products and their states?

1. Kandhamal Haldi : Jharkhand
2. Dindigul locks : Karnataka
3. Tirur Betel leaf : Kerala
4. Kandangi sarees : Tamil Nadu

Which of the pairs given above is/are correctly matched?

(a) 1, 2 and 3 only
(b) 3 and 4 only
(c) 1 and 4 only
(d) 1, 2, 3 and 4

Solution: B
GI tag:

- A GI is primarily an agricultural, natural or a manufactured product (handicrafts and industrial goods) originating from a definite geographical territory.
- Typically, such a name conveys an assurance of quality and distinctiveness, which is essentially attributable to the place of its origin.

GI Tag products:

1. Odisha has bagged the geographical indication (GI) tag for its local version of “Rasagola”.
   
   This GI tag, numbered 612, is the second for Odisha. It got its first GI tag for Kandhamal Haldi.

2. Palani Panchamirtham from Palani Town in Dindigul District of Tamil Nadu State.

3. Tawlhlohpuan and Mizo Puanchei from the state of Mizoram.

4. Tirur Betel leaf from Kerala.

5. Two products from Tamil Nadu — Dindigul lock and Kandangi Saree — have been given the Geographical Indication (GI) tag by The Geographical Indications Registry in Chennai.
   
   The Dindigul locks are known throughout the world for their superior quality and durability, so much so that even the city is called Lock City.

   The Kandangi sarees are manufactured in the entire Karaikudi taluk in Sivaganga district. They are characterised by large contrast borders and some are known to have borders covering as far as two-thirds of the saree which is usually around 5.10 m-5.60 m in length.

74. The term ‘edge effect’ is largely associated with:

   (a) Ecological Niche
   (b) Ecotone
   (c) Food Chain
   (d) Climate change

**Solution: B**

An Ecotone describes an area that acts as a transition or boundary between two ecosystems. This could be, for example, an area of marshland between a river and the riverbank, a clearing within a forest or a much larger area such as the transition between Arctic Tundra and Forest biomes in Northern Siberia.
As this area is inevitably influenced by the two bordering ecosystems, it is therefore a consequence of this that a higher density of organisms and variety of species can be found within an Ecotone.

This increase in biodiversity is referred to as the “edge effect”.

75. Child well-being index has been released by
   (a) Kailash Satyarthi Children’s Foundation
   (b) NITI Aayog
   (c) Ministry of Women and Child Development
   (d) World Vision India and research institute IFMR LEAD

Solution: D

Child well-being index:

- The India child well-being index has been released by the non-government organization World Vision India and research institute IFMR LEAD.

About the index:

- The child well-being index, a tool designed to measure and tracks children’s well-being comprehensively.
- This report provides insights on health, nutrition, education, and sanitation and child protection.
- The dimensions of the index include healthy individual development, positive relationships and protective contexts.
- It is a crucial report that can be mined both by the Government and civil organisations to achieve the goal of child well-being.
- One of the primary objectives of this index is to garner attention to the under-researched theme of child well-being in India, and inspire further academic and policy conversations on related issues.

Key findings of the report:

- Kerala, Tamil Nadu, Himachal Pradesh and Puducherry topped the charts.
- Meghalaya, Jharkhand and Madhya Pradesh featured at the bottom.
- The data shows that even states that are performing best in overall child well-being, are not doing so well in indicators of health.
76. Consider the following statements regarding Census of Asiatic Lion

1. The census is conducted once every five years.
2. The first Lion Census was conducted by the Nawab of Junagadh in 1936.
3. In recent census, the count was estimated from a population “observation” exercise called Poonam Avlokan.

Which of the statements given above is/are correct?

(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

**Solution: D**

Census of Asiatic Lion

- Census of Asiatic lion was recently conducted by the Gujarat government and the details have been released.

<table>
<thead>
<tr>
<th>Year</th>
<th>Adult Male</th>
<th>Adult Female</th>
<th>Subadult</th>
<th>Cubs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>99</td>
<td>95</td>
<td>27</td>
<td>63</td>
<td>284</td>
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<td>2015</td>
<td>109</td>
<td>201</td>
<td>73</td>
<td>140</td>
<td>523</td>
</tr>
<tr>
<td>2020</td>
<td>159</td>
<td>262</td>
<td>115</td>
<td>138</td>
<td>674</td>
</tr>
</tbody>
</table>

*Source: Gujarat state forest and environment department sources*

About the lion census:

- The census is conducted once every five years. This year it was delayed due to lockdowns.
• The first Lion Census was conducted by the Nawab of Junagadh in 1936; since 1965, the Forest Department has been regularly conducting the Lion Census every five years.

• The 6th, 8th and 11th Censuses were each delayed by a year, for various reasons.

**Key figures this year:**

• **28% rise in population of Lions**: Total estimated Lions in Gir region is 674. It was 523 in 2015.

• **36% Expanse in distribution**: Today, Asiatic lions are present in Protected Areas and agro-pastoral landscapes of Saurashtra covering nine districts, over an expanse of about 30,000 sq. km. It was 22,000 sq. km in 2015.

How was the census carried out this year? How is it different from previous census?

• **Reduced participation**: Every year, the state Forest Department invites NGOs, experts and wildlife enthusiasts to join the Census for transparency and augmenting manpower. But this time, it was not advisable to send so many people inside the forest as the Bronx Zoo in New York had reported a case of transmission of novel coronavirus from a human to a tigress.

• So, this year, the count was estimated not from a Census, but from a population “observation” exercise called **Poonam Avlokan**.

How it was carried out?

• Poonam Avlokan (developed in 2014) is a monthly in-house exercise carried out every full moon.

• Field staff and officers spend 24 hours assessing the number of lions and their locations in their respective jurisdictions.

• Unlike previous census, which had nearly 2000 participants, this census had around 1400 staff and a few experts.

• These staff kept moving in their respective territories and made their estimates based on inputs provided by lion trackers and on chance sightings.

**What is Block counting method?**

• **India** uses this method to estimate the numbers.

• In this method, census enumerators remain stationed at water points in a given block and estimate abundance of lions in that block, based on direct sighting of lions who need to drink water at least once in 24 hours during the summer.

• There are inherent issues with this method. So, newer methods should be adopted—such as camera trapping and identifying lions based on permanent marks on their body, and statistical estimates based on the animals’ predatory patterns and numbers of their prey base.
Concerns over the estimates:

- Few experts are doubtful about the estimated numbers. They say it could be an overestimation. It is because:
  - 12 lions were killed in a flash flood in Amreli just a month after the 2015 census.
  - More than two dozen lions in an outbreak of canine distemper virus (CDV) and babesiosis in 2018.
  - A babesiosis outbreak was reported this summer too, and around two dozen lions are reported killed.

Why we need to relocate the lions to other regions?

- Presently, Asiatic lions are confined only to Gujarat. A single epidemic could wipe the entire population and the species might become extinct. Hence, introduction of species to new areas and states might be a good idea.

About Asiatic Lions: Listed as ‘Endangered’ under the IUCN Red List.

- Its population is restricted to the state of Gujarat in India.
- Wildlife under constitution: In 1976, the 42nd amendment incorporated protection of wildlife and forests in the Directive Principles. It also included forests and protection of wild animals in the Concurrent List – Seventh Schedule (Article 246) of the Constitution.

77. Which of the following is the largest butterfly in India?

- (a) Quaker
- (b) Southern Birdwing
- (c) Golden Birdwing
- (d) Blue Tiger

Solution: C

What is the name of butterfly recently recorded as the largest in India?

- A Himalayan butterfly named Golden Birdwing is now India’s largest.
- While the female Golden Birdwing was recorded from Didihat in Uttarakhand, the largest male was from the Wankhar Butterfly Museum in Meghalaya capital Shillong.
- So far, the record was held by the Southern Birdwing, recorded in 1932.
• The **only measurement** used in the study of Lepidoptera is **wingspan** — a simple concept with various interpretations of the term.

• The **wingspan of female Golden Birdwing** is **194 mm**, marginally larger than the Southern Birdwing (190 mm).

• The **smallest** is the **Quaker** (Neoipithecops zalmora) with a wingspan of 18 mm and forewing length of 8 mm.

78. Consider the following statements regarding Kanchenjunga Biosphere Reserve
   1. It is located in the state of Assam
   2. It was designated as a World Heritage Site.
   Which of the statements given above is/are correct?
   (a) 1 only
   (b) 2 only
   (c) Both 1 and 2
   (d) Neither 1 nor 2

*Solution: B*

Khangchendzonga Biosphere Reserve:

• Kanchenjunga Biosphere Reserve is a National Park and a Biosphere Reserve located in **Sikkim**, India. The park is named after the mountain Kangchenjunga, which with a height of 8,586 metres (28,169 ft), is the **third-highest peak in the world**.

• The Biosphere Reserve is one of the **highest ecosystems in the world**, reaching elevations of 1,220 metres above sea-level. It includes a range of ecolines, varying from **sub-tropic to Arctic**, as well as natural forests in different biomes, which support an immensely rich diversity of forest types and habitats.

• The core zone – Khangchendzonga National Park was designated as a **World Heritage Site** in 2016 under the ‘mixed’ category.

79. Consider the following statements regarding Fishing cats
   1. The fishing cat is nocturnal (active at night).
   2. It is the state animal of Odisha.
   3. It is listed as Vulnerable under IUCN Red List.
   Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

**Solution: B**

**Fishing cats:**
- The Odisha Government has started a two-year *conservation project for Fishing Cats* in Bhitarkanika National Park.

**Key facts:**
- The fishing cat is **nocturnal** (active at night).
- **State animal of West Bengal.**
- **Habitats:** In India, fishing cats are mainly found in the mangrove forests of the Sundarbans, on the foothills of the Himalayas along the Ganga and Brahmaputra river valleys and in the Western Ghats.

**Protection:**
- **Vulnerable**— IUCN Red List.
- CITES: Appendix II
- Indian Wildlife Protection Act, 1972: Schedule I.

Fishing Cat Project, launched in 2010 started raising awareness about the Cat in West Bengal.

80. Consider the following statements regarding Central Pollution Control Board

1. It has been established under the Air (Prevention and Control of Pollution) Act-1981.
2. It serves as a field formation and also provides technical services to the Ministry of Environment and Forests under the provisions of the Environment (Protection) Act, 1986.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2
Central Pollution Control Board (CPCB):

Central Pollution Control Board (CPCB), statutory organisation, was constituted in September, 1974 under the Water (Prevention and Control of Pollution) Act, 1974. Further, CPCB was entrusted with the powers and functions under the Air (Prevention and Control of Pollution) Act, 1981.

Functions:

- To promote cleanliness of streams and wells in different areas of the States by prevention, control and abatement of water pollution.
- To improve the quality of air and to prevent, control or abate air pollution in the country.

81. Which of the following are critically endangered species?

   1. Namdapha Flying Squirrel
   2. Malabar Civet
   3. Jerdon’s Courser
   4. River Terrapin

Select the correct answer using the code given below:

(a) 1, 2 and 3 only
(b) 1, 3 and 4 only
(c) 2, 3 and 4 only
(d) 1, 2, 3 and 4

Solution: D

Critically Endangered Mammals

| Pygmy Hog | Large Rock Rat or Elvira Rat |
| Andaman White-toothed Shrew | Namdapha Flying Squirrel |
| Jenkin’s Andaman Spiny Shrew | Malabar Civet |
| Nicobar White-tailed Shrew | Sumatran Rhinoceros |
| Kondana Rat | Javan Rhinoceros |
Critically Endangered Birds

- Aythya baeri
- Forest Owlet
- Great Indian Bustard
- Bengal Florican
- Siberian Crane
- Spoon-billed Sandpiper
- Sociable Lapwing
- Jerdon’s Courser
- White-backed Vulture
- Red-headed Vulture
- White-bellied Heron
- Slender-billed Vulture
- Indian Vulture
- Pink-headed Duck
- Himalayan Quail

Critically Endangered Reptiles

- Gharial
- Hawksbill Turtle
- Leatherback Turtle
- River Terrapin
- Bengal Roof Turtle
- Sispara day gecko

82. Consider the following statements regarding Globba andersonii

1. It is critically endangered plant species and is commonly called as dancing ladies or swan flowers.

2. The species is restricted mainly to Nilgiris hills.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

**Solution: A**

Globba andersonii:

- It is a rare and critically endangered plant species.
- It is commonly as ‘dancing ladies’ or ‘swan flowers’.
- They are characterised by white flowers, non-appendaged anthers (the part of a stamen that contains the pollen) and a “yellowish lip”.
- The species is restricted mainly to **Teesta River Valley region** which includes the Sikkim Himalays and Darjeeling hill ranges.
- The plant usually grows in a dense colony as a lithophyte (plant growing on a bare rock or stone).
Researchers have “rediscovered” this plant species from the Sikkim Himalayas near the Teesta river valley region after a gap of nearly 136 years.

It was thought to have been extinct until its “re-collection”, for the first time since 1875.

83. Which of the following is/are the applications of DNA Profiling?

1. Identification of missing persons
2. Establishing parentage
3. Study of animal and floral populations
4. Wild life crimes

Select the correct answer using the code given below

(a) 1 and 4 only
(b) 2 and 3 only
(c) 1, 3 and 4 only
(d) 1, 2, 3 and 4

Solution: D

DNA Profiling:

DNA profiling (also called DNA fingerprinting, DNA testing, or DNA typing) is a forensic technique used to identify individuals by characteristics of their DNA. A DNA profile is a small set of DNA variations that is very likely to be different in all unrelated individuals.

Benefits:

- Help to convict serious criminals and possibly even preventing crime.
- Useful in the aftermath of a natural disaster for disaster victim identification.
- Identification of missing persons and human remains
- Medical research purposes
- Establishing parentage or blood relations between individuals.
- DNA fingerprinting is used in the study of animal and floral populations
- To address the issue of thousands of unclaimed dead bodies that are reported annually
- This can also be used in the area of wild life crimes
84. Which of the following are Biosphere Reserves in India?

1. Great Nicobar
2. Gulf of Mannar
3. Simlipal
4. Seshachalam Hills

Select the correct answer using the code given below:

(a) 1, 2 and 3 only
(b) 1, 3 and 4 only
(c) 2, 3 and 4 only
(d) 1, 2, 3 and 4

Solution: D

Biosphere Reserves in India (as on Dec, 2014)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Nilgiri</td>
<td>Part of Wayanad, Nagarhole, Bandipur and Madumalai, Nilambur, Silent Valley and Siruvani hills (Tamil Nadu, Kerala and Karnataka).</td>
</tr>
<tr>
<td>2. Nanda Devi</td>
<td>Part of Chamoli, Pithoragarh, and Bageshwar districts (Uttarakhand).</td>
</tr>
<tr>
<td>3. Nokrek</td>
<td>Part of Garo hills (Meghalaya)</td>
</tr>
<tr>
<td>4. Great Nicobar</td>
<td>Southern most islands of Andaman And Nicobar (A&amp;N Islands).</td>
</tr>
<tr>
<td>5. Gulf of Mannar</td>
<td>Indian part of Gulf of Mannar between India and Sri Lanka (Tamil Nadu).</td>
</tr>
<tr>
<td>6. Manas</td>
<td>Part of Kokrajhar, Bongaigaon, Barpeta, Nalbari, Kamrup and Darang districts (Assam)</td>
</tr>
<tr>
<td>7. Sunderbans</td>
<td>Part of delta of Ganges and Brahmaputra river system (West Bengal).</td>
</tr>
<tr>
<td>8. Simlipal</td>
<td>Part of Mayurbhanj district (Orissa).</td>
</tr>
<tr>
<td>9. Dibru-Saikhowa</td>
<td>Part of Dibrugarh and Tinsukia Districts (Assam)</td>
</tr>
<tr>
<td>10. Dehang-Dibang</td>
<td>Part of Siang and Dibang Valley in Arunachal Pradesh.</td>
</tr>
<tr>
<td>11. Pachmarhi</td>
<td>Parts of Betul, Hoshangabad and Chindwara districts of Madhya Pradesh.</td>
</tr>
<tr>
<td>12. Khangchendzonga</td>
<td>Parts of Khangchendzonga hills and Sikkim.</td>
</tr>
</tbody>
</table>
15. Kachchh | Part of Kachchh, Rajkot, Surendra Nagar and Patan Civil Districts of Gujarat State
---|---
16. Cold Desert | Pin Valley National Park and surroundings; Chandratal and Sarchu & Kibber Wildlife Sanctuary in Himachal Pradesh
17. Seshachalam Hills | Seshachalam Hill Ranges covering parts of Chittoor and Kadapa districts of Andhra Pradesh
18. Panna | Part of Panna and Chhattarpur districts in Madhya Pradesh

85. Consider the following statements regarding the Canine Distemper Virus

1. It is caused by a single-stranded RNA virus of the family Paramyxoviridae
2. It affects a wide variety of animal families like dogs, foxes, pandas, wolves, ferrets and large cats.
3. There is no known cure for CDV.

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Solution: D

Canine distemper virus (CDV):

- A recent study published in Threatened Taxa notes that 86% of the tested dogs around Ranthambhore National Park in Rajasthan carried Canine Distemper Virus (CDV) antibodies in their bloodstream.
- Canine Distemper Virus (CDV) is a viral disease that infects the gastrointestinal, respiratory, and central nervous system.
- Canine distemper is caused by a single-stranded RNA virus of the family Paramyxoviridae (the same family of the viruses that causes measles, mumps, and bronchiolitis in humans).
- It affects a wide variety of animal families, including domestic and wild species of dogs, foxes, pandas, wolves, ferrets and large cats as well.
- Dogs who have not been vaccinated for Canine Distemper are the most at-risk. While the disease can also be contracted when improperly vaccinated or when a dog has high susceptibility to bacterial infection, these cases are rare.
CDV can be spread through direct contact (licking, breathing air, etc.) or indirect contact (bedding, toys, food bowls, etc.), though it cannot live on surfaces for very long. Inhaling the virus is the primary method of exposure. There is no known cure for CDV.

86. Consider the following pairs of tiger reserves with the states they are located:

<table>
<thead>
<tr>
<th>Tiger Reserve</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Achanakmar</td>
<td>Chattisgarh</td>
</tr>
<tr>
<td>2. Dandeli-Anshi</td>
<td>Maharashtra</td>
</tr>
<tr>
<td>3. Sahyadri</td>
<td>Karnataka</td>
</tr>
<tr>
<td>4. Pench</td>
<td>Madhya Pradesh</td>
</tr>
</tbody>
</table>

Which of the pairs given above is/are correctly matched?

(a) 1 and 2 only
(b) 2 and 3 only
(c) 3 and 4 only
(d) 1 and 4 only

Solution: D

Sl. No. | Name of Tiger Reserve            | State
-------|----------------------------------|--------
1       | Nagarjunsagar Srisailam (part)*  | Andhra Pradesh |
2       | Namdapha                         | Arunachal Pradesh |
3       | Kamlang Tiger Reserve            | Arunachal Pradesh |
4       | Pakke                            | Arunachal Pradesh |
5       | Manas                            | Assam |
6       | Nameri                           | Assam |
7       | Orang Tiger Reserve              | Assam |
8       | Kaziranga                        | Assam |
9       | Valmiki                          | Bihar |
10      | Udanti-Sitanadi                 | Chattisgarh |
11      | Achanakmar                      | Chattisgarh |
12      | Indravati                        | Chhattisgarh |
13      | Palamau                         | Jharkhand |
14      | Bandipur                        | Karnataka |
<table>
<thead>
<tr>
<th></th>
<th>Location</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Bhadra</td>
<td>Karnataka</td>
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<tr>
<td>16</td>
<td>Dandeli-Anshi</td>
<td>Karnataka</td>
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<tr>
<td>17</td>
<td>Nagarhole</td>
<td>Karnataka</td>
</tr>
<tr>
<td>18</td>
<td>Biligiri Ranganatha Temple</td>
<td>Karnataka</td>
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<td>19</td>
<td>Periyar</td>
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<td>Parambikulam</td>
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<td>Kanha</td>
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<td>Mukundra Hills</td>
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<td>39</td>
<td>Kalakad-Mundanthurai</td>
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<td>45</td>
<td>Dudhwa</td>
<td>Uttar Pradesh</td>
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87. The protected area is the fourth largest national park in India and located in Arunachal Pradesh. The vegetation zones from evergreen, moist deciduous to temperate broadleaved and coniferous forest types to alpine vegetation. Four pantherine species occur in the park: leopard, snow leopard, tiger and clouded leopard.

Which of the following protected area has been described above?

(a) Mouling National Park
(b) Namdapha National Park
(c) Dibru Saikhowa National Park
(d) Orang National Park

Solution: B

- **Namdapha National Park** is a 1,985 km² (766 sq mi) large protected area in Arunachal Pradesh of Northeast India. With more than 1,000 floral and about 1,400 faunal species, it is a **biodiversity hotspot** in the Eastern Himalayas. It is the fourth largest national park in India.

- Because of the elevation range from 300 to 4,500 m and vegetation zones from **evergreen, moist deciduous to temperate broadleaved and coniferous forest types to alpine vegetation**, the park is home to a great diversity of mammal species. Four pantherine species occur in the park: leopard, **snow leopard**, tiger and clouded leopard.

88. Index of Eight Core Industries has been released by

(a) NITI Aayog
(b) Ministry of Statistics and Programme Implementation
(c) Ministry of Commerce and Industry.
(d) Ministry of Finance
Index of Eight Core Industries:

- The **Index of Industrial Production (IIP)** is an index which details out the growth of various sectors in an economy such as mining, electricity and manufacturing.

- The all India IIP is a composite indicator that measures the short-term changes in the volume of production of a basket of industrial products during a given period with respect to that in a chosen base period.

- It is compiled and published monthly by the **Central Statistical Organisation (CSO)** six weeks after the reference month ends.

- The **eight core industries** are: Coal, Crude oil, Natural Gas, Refinery products, fertilizers, steel, cement and electricity.

89. Consider the following statements regarding Reserved and Protected Forests

1. Rights to all activities like hunting, grazing, etc. in reserved forests are banned unless specific orders are issued otherwise.

2. In protected areas, rights to activities like hunting and grazing are sometimes given to communities living on the fringes of the forest, who sustain their livelihood from forest resources or products.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

**Solution: C**

Reserved & Protected Forests

As of present, reserved forests and protected forests differ in one important way:

- Rights to all activities like hunting, grazing, etc. in reserved forests are banned unless specific orders are issued otherwise.

- In protected areas, rights to activities like hunting and grazing are sometimes given to communities living on the fringes of the forest, who sustain their livelihood from forest resources or products.

- The first reserve forest in India was Satpura National Park in Madhya Pradesh.
Typically, reserved forests are often upgraded to the status of wildlife sanctuaries, which in turn may be upgraded to the status of national parks, with each category receiving a higher degree of protection and government funding.

90. Consider the following statements

1. Kutiyattam Theatre has been recognised by UNESCO as intangible heritage of humanity
2. Sangeet Natak Akademi has been functioning as the apex body of the performing arts in the country, preserving and promoting the vast intangible heritage of India’s diverse culture expressed in the forms of music, dance and drama.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: C

Sangeet Natak Akademi has been functioning as the apex body of the performing arts in the country, preserving and promoting the vast intangible heritage of India’s diverse culture expressed in the forms of music, dance and drama.

Akademi’s projects of national importance are in Kutiyattam theatre of Kerala, commenced in 1991. Kutiyattam was recognized by UNESCO as a masterpiece of oral and intangible heritage of humanity in 2001.

91. Consider the following statements regarding Eco-sensitive zones

1. The Environment Protection Act, 1986 does not mention the word “Eco-sensitive Zones”.
2. These areas are notified by State government.
3. The purpose of declaring ESZs is to create some kind of “shock absorbers” to the protected areas by regulating and managing the activities around such areas.

Which of the statements given above is/are correct?

(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

Solution: B

- **Eco-Sensitive Zones (ESZs) or Ecologically Fragile Areas (EFAs)** are areas in India notified by the **Ministry of Environment, Forests and Climate Change (MoEFCC)**, Government of India around Protected Areas, National Parks and Wildlife Sanctuaries. The purpose of declaring ESZs is to create some kind of “**shock absorbers**” to the protected areas by regulating and managing the activities around such areas. They also act as a transition zone from areas of high protection to areas involving lesser protection.

What are Eco-sensitive zones?
- The Environmental Protection Act, 1986 does not mention the word “Eco-sensitive Zones”.
- The section 3(2)(v) of the Act, says that **Central Government can restrict areas** in which any industries, operations or processes shall not be carried out or shall be carried out subject to certain safeguards.
- Besides the section 5 (1) of this act says that **central government can prohibit or restrict** the location of industries and carrying on certain operations or processes on the basis of considerations like the biological diversity of an area, maximum allowable limits of concentration of pollutants for an area, environmentally compatible land use, and proximity to protected areas.
- The above two clauses have been effectively used by the government to declare Eco-Sensitive Zones or Ecologically Fragile Areas (EFA). The same criteria have been used by the government to declare **No Development Zones**.

Criteria:
- The MoEF (Ministry of Environment & Forests) has approved a comprehensive set of guidelines laying down parameters and criteria for declaring ESAs. A committee constituted by MoEF put this together. The guidelines lay out the criteria based on which areas can be declared as ESAs. These include **Species Based** (Endemism, Rarity etc), **Ecosystem Based** (sacred groves, frontier forests etc) and **Geomorphologic feature based** (uninhabited islands, origins of rivers etc).

92. Which of the following organization launched the ‘Global wildlife Program (GWP)?
   (a) The Global Environment Facility (GEF)
   (b) International Union for Conservation of Nature (IUCN)
   (c) United Nations Environment Programme (UNEP)
The Convention on the Conservation of Migratory Species of Wild Animals

Solution: A

- The Global Environment Facility (GEF) in June 2015 launched the “Global Partnership on Wildlife Conservation and Crime Prevention for Sustainable Development” program also known as the Global Wildlife Program (GWP).
- The GWP is a World Bank-led, GEF-funded global partnership that promotes wildlife conservation and sustainable development by combatting illicit trafficking in wildlife. Phase II of the Global Wildlife Program (GWP) was approved by the Global Environment Facility (GEF) Council in June 2019. The $82 million grant (Phase II) builds on a $131 million grant from Phase I, 2015, allowing the GWP to curb illegal wildlife trade and promote wildlife-based economies in 37 projects across 32 countries in Africa, Asia and Latin America.

93. Global Diplomacy Index, sometime seen in the news, is related by
   (a) United Nations
   (b) World Economic Forum
   (c) Lowy Institute.
   (d) Yale University

Solution: C

- Global Diplomacy Index Sydney based Lowy Institute. Index visualises the diplomatic networks of 61 G20, OECD and Asian countries and territories, allowing users to compare the most significant diplomatic networks in the world.
- China now has more diplomatic posts across the world than United States in 2019.


94. Which of the following regions areas is/are known for Mangrove vegetation in India?
   1. Gulf of Kutch
   2. Sunderbans
   3. Andaman and Nicobar Islands

Select the correct answer using the code given below:
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 only
(d) 1, 2 and 3

**Solution: D**

Mangroves are salt-tolerant plants of tropical and subtropical intertidal regions of the world. The specific regions where these plants occur are termed as ‘mangrove ecosystem’. These are highly productive but extremely sensitive and fragile. Besides mangroves, the ecosystem also harbours other plant and animal species.

- Experiences have proved that the presence of mangrove ecosystems on coastline save lives and property during natural hazards such as cyclones, storm surges and erosion. These ecosystems are also well known for their economic importance. They are breeding, feeding and nursery grounds for many estuarine and marine organisms. Hence, these areas are used for captive and culture fisheries. The ecosystem has a very large unexplored potential for natural products useful for medicinal purposes and also for salt production, apiculture, fuel and fodder, etc.

- The distribution of mangrove ecosystem on Indian coastlines indicates that the Sundarban mangroves occupy very large area followed by Andaman-Nicobar Islands and Gulf of Kutch in Gujarat.

- Rest of the mangrove ecosystems is comparatively smaller.

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<tr>
<th>West Bengal</th>
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<td>Gulf of Kambhat</td>
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<td>Dumas-Uhrat</td>
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<td>North Andaman</td>
<td>Vembanad</td>
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<tr>
<td>Nicobar</td>
<td>Kannur (North Kerala)</td>
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95. Consider the following statements regarding Irrawaddy Dolphins

1. Irrawaddy dolphins are found in coastal areas in South and Southeast Asia.
2. Dolphin distribution in Chilika is considered to be the highest single lagoon population.
3. It is critically endangered species

Which of the statements given above is/are correct?

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

Solution: D

- **Irrawaddy dolphins** are found in coastal areas in South and Southeast Asia, and in three rivers: the Irrawaddy (Myanmar), the Mahakam (Indonesian Borneo) and the Mekong.
- **Dolphin distribution in Chilika is considered to be the highest single lagoon population.**
- It is an **endangered** species.


96. Consider the following statements regarding the Great Indian Bustard:

1. It is categorized as critically endangered under IUCN Red list.
2. Desert National Park, Rajasthan is the most important habitat of the bird.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Solution: C
The Great Indian Bustard, one of the heaviest flying birds, can weigh up to 15 kg and grow up to one metre in height. It is considered the flagship grassland species, representing the health of the grassland ecology.

- Till 1980s, about 1,500-2,000 Great Indian Bustards were spread throughout the western half of India, spanning eleven states. However, with rampant hunting and declining grasslands, their population dwindled. In July 2011, the bird was categorised as “critically endangered” by the International Union for Conservation of Nature (IUCN).

- **Desert National Park, Rajasthan**, India, is situated in the state of Rajasthan near the towns of Jaisalmer and Barmer.

- Perhaps the greatest attraction of the park is a bird called the great Indian bustard, a critically endangered species found only in India. Desert National Park is one of the last sites in which this species can be found in good numbers.

97. The Pin Valley National Park is located in which of the following States?
   (a) Uttarakhand
   (b) Himachal Pradesh
   (c) Assam
   (d) Arunachal Pradesh

**Solution: B**

- Pin Valley National Park is located within the Lahaul and Spiti district, in the state of **Himachal Pradesh**.

- This park is specially renowned for the protection of endangered **Snow-Leopard**, the estimated population of which is about twelve. Other species are Ibex, Bharal, Red Fox, Marten, Weasel, Pika, Snow Cock, Beareded Vulture, Chukor, Golden Eagle, Griffon, Himalayan Chough, Raven etc.

98. With reference to Serious Fraud Investigation Office (SFIO), consider the following statements.

1. It is a multi-disciplinary organization having experts from financial sector, capital market, accountancy, forensic audit, taxation, law, information technology, company law, customs and investigation.

2. It is under the jurisdiction of the Ministry of Finance, Government of India.

Which of the statements given above is/are correct?

(a) 1 only
99. Consider the following statements regarding the ‘National Board for Wildlife (NBWL):

1. It is a non-statutory body set by the executive resolution.
2. Minister of Environment is the ex-officio chairman of the board.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

**Solution: D**

About National Board for Wildlife:

- It is a “Statutory Organization” constituted under the Wildlife Protection Act, 1972.
- Its roles is “advisory” in nature and advises the Central Government on framing policies and measures for conservation of wildlife in the country.
- Primary function of the Board is to promote the conservation and development of wildlife and forests.
• It has power to review all wildlife-related matters and approve projects in and around national parks and sanctuaries.

• No alternation of boundaries in national parks and wildlife sanctuaries can be done without approval of the NBWL.

• **Composition:** The NBWL is chaired by the Prime Minister. It has 47 members including the Prime Minister. Among these, 19 members are ex-officio members. Other members include three Members of Parliament (two from Lok Sabha and one from Rajya Sabha), five NGOs and 10 eminent ecologists, conservationists and environmentalists.

100. Atal Innovation Mission (AIM) has been initiated by

(a) Ministry of Micro, Small and Medium Enterprises
(b) NITI aayog
(c) Ministry of Commerce and Industry
(d) Ministry of Human Resource Development

**Solution: B**

• The **Atal Innovation Mission (AIM)** is a flagship initiative set up by the NITI Aayog to promote innovation and entrepreneurship across the length and breadth of the country.

• AIM's objectives are to create and promote an ecosystem of innovation and entrepreneurship across the country at school, university, research institutions, MSME and industry levels.

**The Atal Innovation Mission has following two core functions:**

• **Entrepreneurship promotion** through Self-Employment and Talent Utilization, wherein innovators would be supported and mentored to become successful entrepreneurs.

• **Innovation promotion:** to provide a platform where innovative ideas are generated.

***
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