



## MISSION VIJAYA 2.0 PREPARATORY EXAM- 8

Held on 11 AUGUST 2024

KAS- 2024

ANSWER KEY AND SYNOPSIS

NAMMAKpsc

*Note: We have taken all effort to ensure correct answer keys. In case of any mistakes, please refer to the detailed synopsis. Please mail us at [nammakpsc@gmail.com](mailto:nammakpsc@gmail.com) or call us for any assistance. Thank you*

1. Ans : A

### X-RAY POLARIMETER SATELLITE (XPOSAT)

- Launch: Recently by ISRO using the PSLV-C58 rocket.
- Purpose: Study X-ray polarization in the medium X-ray band to understand radiation mechanisms and geometry of celestial sources.
- Payloads:
  - POLIX (Polarimeter Instrument in X-rays): Observes about 40 bright astronomical sources.
  - XSPECT (X-ray Spectroscopy and Timing): Studies electromagnetic spectrum generated by different matter.
- Development: Built by ISRO's UR Rao Satellite Centre and Raman Research Institute; development began in 2008 and was formalized in 2015.
- Global Context: Second mission globally dedicated to X-ray polarization in the medium X-ray band (NASA's IXPE was the first).
- National Contribution: India's third space-based observatory, following Aditya-L1 (solar mission) and AstroSat (2015).

HEBBAL | VIJAYANAGAR

Est: 2014

2. Ans : D

### BUBBLE BABY SYNDROME (SEVERE COMBINED IMMUNODEFICIENCY, SCID)

- Definition: A rare genetic disorder causing severe, life-threatening problems with the immune system.
- Genetic Mutations: Inherited from one or both parents, affecting multiple genes.
- Type: Primary immune deficiency.

What Happens in SCID:

- Immune System Development: Begins in the bone marrow where stem cells develop into red blood cells, white blood cells, and platelets.
- White Blood Cells (WBCs): Protect the body from infections.
  - T-cells: Identify, attack, and kill pathogens.
  - B-cells: Produce antibodies that "remember" infections.

- SCID Effect: Affects both T-cells and B-cells, leading to a deficient immune response.

Symptoms:

- At Birth: May appear healthy.
- Post-Birth Issues:
  - Failure to thrive
  - Chronic diarrhea
  - Frequent and severe respiratory infections
  - Oral thrush (yeast infection in the mouth)
  - Other serious and hard-to-treat infections

Treatment:

- Emergency: SCID requires urgent medical attention.
- Common Treatment: Stem cell transplant (bone marrow transplant) from a donor to rebuild the child's immune system.
- Prognosis: Without treatment, survival past the first year is unlikely.

### 3. Ans : A

#### NATIONAL HUMAN RIGHTS COMMISSION (NHRC)

- Headquarters: New Delhi
- Genesis: It is a statutory body, established under the Protection of Human Rights Act (PHRA), 1993 as amended in 2006 and 2019.
- PHRA defines Human Rights as the rights relating to life, liberty, equality and dignity of the individual. These rights are guaranteed by the Constitution or embodied in International Covenants and are enforceable by courts in India.
- Tenure: Chairperson and members of NHRC will hold office for three years or till the age of seventy years, whichever is earlier.

### 4. Ans : A

- The World Health Organization (WHO) has included the NOMA disease (cancrum oris or gangrenous stomatitis) in its official list of neglected tropical diseases (NTDs).
- Noma is a severe gangrenous disease of the mouth and face. Its pathogenesis is linked with non-specific polymicrobial organisms and a range of modifiable risk factors.
- It mostly affects children aged 2–6 years suffering from malnutrition, affected by infectious diseases, living in extreme poverty with poor oral health or with weakened immune systems. Noma can also occur among immunocompromised adults due to HIV, leukemia and other diseases .
- Evidence indicates that the causative agents of NOMA are non-specific polymicrobial organisms. There is also a wide range of associated risk factors reported: malnutrition, other causes of immunosuppression, underlying infections, poor oral health and extreme poverty. There is no documented evidence to support direct transmission from person to person.

**5. Ans : D****MAGNETARS**

- Definition: Neutron stars with extremely strong magnetic fields (over one quadrillion times Earth's magnetic field).
- Radiation: Emit high-energy electromagnetic radiation due to the decay of their powerful magnetic fields.
- Characteristics:
  - Strong temporal variability.
  - Typically feature slow rotation and rapid spin-down.
  - Display bright, short bursts and up to months-long outbursts

**6. Ans : A**

- Some Exoplanets might possess a brittle lithosphere only a few miles thick — so-called eggshell planets.
- The extremely thin brittle lithospheres of eggshell planets may not prove rigid enough to support high-standing mountains, leading to relatively smooth surfaces. In addition, their outer layers may not prove strong enough to produce the strong dense plates needed for plate tectonics, which drives continental drift and mountain-building on Earth.
- The absence of plate tectonics suggests that eggshell planets may not prove habitable to life.

**7. Ans : C**

The Integrated Guided Missile Development Programme (IGMDP) was conceived by renowned scientist Dr. APJ Abdul Kalam to enable India attain self-sufficiency in the field of missile technology.

The missiles developed under the programme were:

- Short-range surface-to-surface ballistic missile Prithvi
- Intermediate-range surface-to-surface ballistic missile Agni
- Short-range low-level surface-to-air missile Trishul
- Medium-range surface-to-air missile Akash
- Third generation anti-tank missile Nag

**8. Ans : B**

- A new species of jellyfish was discovered and named 'St. George's Cross Medusa (scientific name: Santjordia pagesi)'
- This species has only been found inside the Sumisu Caldera in the Ogasawara Islands, southeast of Tokyo, Japan.

**9. Ans : D**

- Scientists have recently identified a novel protein called mitochondrial coxiella effector F (MceF). This protein is produced by Coxiella burnetii, a type of Gram-negative intracellular bacterium.
- When Coxiella burnetii infects host cells, it releases MceF into the cellular environment. MceF's presence within the host cell appears to help maintain cellular health even in the presence of a heavy bacterial burden.
- MceF interacts with an enzyme called glutathione peroxidase 4 (GPX4), which is an antioxidant enzyme found within the mitochondria. Mitochondria are organelles responsible for generating energy within cells.
- The interaction between MceF and GPX4 leads to an improvement in mitochondrial function. By working together, MceF and GPX4 promote an anti-oxidizing effect within the mitochondria, helping to protect them from oxidative damage caused by Coxiella burnetii infection

**10. Ans : D**

- Nitrogen hypoxia refers to a medical condition characterized by insufficient oxygen in the body. In the context of execution, nitrogen hypoxia involves inducing a state of asphyxiation by inhaling pure nitrogen gas or nitrogen gas at lethal concentrations.
- It is a process where pure nitrogen gas, or nitrogen gas at concentrations high enough to be lethal, is inhaled to the point of causing asphyxiation. As nitrogen displaces oxygen in the lungs, it gradually reduces the concentration of oxygen in the bloodstream. This leads to hypoxemia, a condition characterized by low oxygen levels in the blood. As oxygen levels decrease, the individual becomes unconscious and eventually succumbs to death due to lack of oxygen to vital organs, particularly the brain
- During nitrogen hypoxia execution, the condemned individual wears a respirator mask over their face. Instead of oxygen, pure nitrogen gas is pumped into the person's lungs
- Nitrogen (N<sub>2</sub>) is a colorless, odorless, and tasteless gas that makes up about 78% of the Earth's atmosphere. Because it is inert and doesn't react with the body, nitrogen doesn't trigger the suffocation reflex, unlike carbon dioxide (CO<sub>2</sub>), which can stimulate the brain's respiratory centers and cause a person to feel like they're suffocating.
- This property of nitrogen makes it a silent killer in enclosed spaces, where it can displace oxygen (O<sub>2</sub>) and lead to asphyxiation without warning signs.

**11. Ans : A****INGENUITY**

- Ingenuity is the first helicopter to fly on Mars.
- It was carried by NASA's rover called Perseverance that was launched in July 2020.

- Ingenuity is able to fly using counter-rotating blades that spin at about 2,400 rpm (Rotations Per Minute).
- It has a wireless communication system, and is equipped with computers, navigation sensors, and two cameras.
- It is solar-powered, able to charge on its own. Unlike Earth, Mars has an atmosphere that is only about 1% as dense, making it challenging for conventional aircraft to generate lift.

**12. Ans : C**

- The Mahindra Armado is India's first Armoured Light Specialist Vehicle (ALSV), designed and manufactured entirely by Mahindra Defence Systems (MDS) for the Indian armed forces. It represents a leap forward in indigenous defense technology and capability.
- The Armado is designed to serve multiple roles within the armed forces, including counter-terrorist and special forces operations, reconnaissance, border patrolling, and quick reaction team deployments.
- The Armado provides robust protection against various threats, with ballistic protection up to the B7 level and STANAG level-2 standards. This ensures defense against armor-piercing rifles and protection from ballistics and explosives on all sides of the vehicle.
- The Armado includes specialized features tailored to challenging environments, such as a self-cleaning-type exhaust scavenging and air filtration system.

**13. Ans : C**

- A new plant-inspired robot named FiloBot has been developed that climbs up structures. Unlike traditional climbing robots, FiloBot does not rely on pre-programmed movements. Instead, it mimics the behavior of climbing vines by absorbing 3D printing filament through its head and gradually extending its length over time, resembling a natural creeper.
- Drawing inspiration from various plant behaviors such as phototropism, negative phototropism, and gravitropism, the team behind FiloBot has developed a sophisticated system that replicates these phenomena in a high-tech robot. Through successful tests, FiloBot has demonstrated remarkable adaptability, dynamically adjusting its growth trajectory in response to changes in light intensity.
- By combining autonomous systems with transportable additive manufacturing techniques and bioinspired behavioral strategies, FiloBot paves the way for robots to navigate unstructured and dynamic environments. Moreover, this innovation hints at the possibility of robots capable of self-building infrastructure, heralding a new era in robotics.

**14. Ans : D**

- Hepatitis A is a highly contagious liver infection caused by the hepatitis A virus (HAV). Hepatitis A is primarily spread through the fecal-oral route, typically by consuming food or water contaminated with the feces of an infected person. It can also be transmitted through close personal contact with an infected individual or through contaminated objects.
- The symptoms of hepatitis A can range from mild to severe and may include fatigue, nausea, vomiting, abdominal pain, fever, dark urine, clay-colored stools, and jaundice (yellowing of the skin and eyes). Symptoms usually appear 2 to 6 weeks after exposure to the virus.
- The Havisure vaccine, developed by the Indian Immunologicals Ltd, is India's first indigenously developed hepatitis A vaccine. It is administered in two doses, with the first dose given to children above 12 months of age and the second dose administered at least six months later.

**15. Ans : D****PLANKTON CRASH**

- A plankton crash refers to the phenomenon where a plankton bloom is replaced by a few surviving plankton, potentially leading to the formation of stable foam on the water's surface due to the decay of dead plankton.
- The causes of a plankton crash include a lack of nutrients or CO<sub>2</sub> early in the production cycle or a sudden change in water quality that can result in plankton death later in the cycle

**16. Ans : A**

- 2023 marked the 50th anniversary of the Chipko movement.
- About Chipko movement
  - Nonviolent resistance against forest cutting that began in the Uttarakhand's Chamoli district.
  - Meaning of 'chipko': It comes from the word 'embrace', as the villagers hugged the trees and encircled them to prevent being hacked.
  - Origin of the movement: Dates back to the 18th century and was started by Rajasthan's Bishnoi community. Led by Amrita Devi against the orders of then King of Jodhpur. o Resulted in passing of a royal decree that banned cutting of trees in all Bishnoi villages
  - Major leaders: Sunderlal Bahuguna, Chandi Prasad Bhatt, Gaura Devi, etc.

**17. Ans : A**

- The National Highways Authority of India (NHAI), nodal agency of the Ministry of Road Transport and Highways has initiated the 'One Vehicle, One FASTag' initiative, aimed at streamlining toll payments and enhancing the efficiency of the Electronic Toll Collection (ETC) system.
- The primary objective of the 'One Vehicle, One FASTag' initiative is to promote the use of a single FASTag for each vehicle, thereby discouraging practices such as using a single FASTag for multiple vehicles or linking multiple FASTags to a particular vehicle. This initiative aims to streamline toll collection processes and ensure compliance with regulatory mandates.
- FASTag employs Radio Frequency Identification (RFID) technology, utilizing passive RFID tags affixed to the windscreen of vehicles. These tags enable automatic toll payments as vehicles pass through toll plazas, improving traffic flow and reducing congestion on highways.

**18. Ans : A**

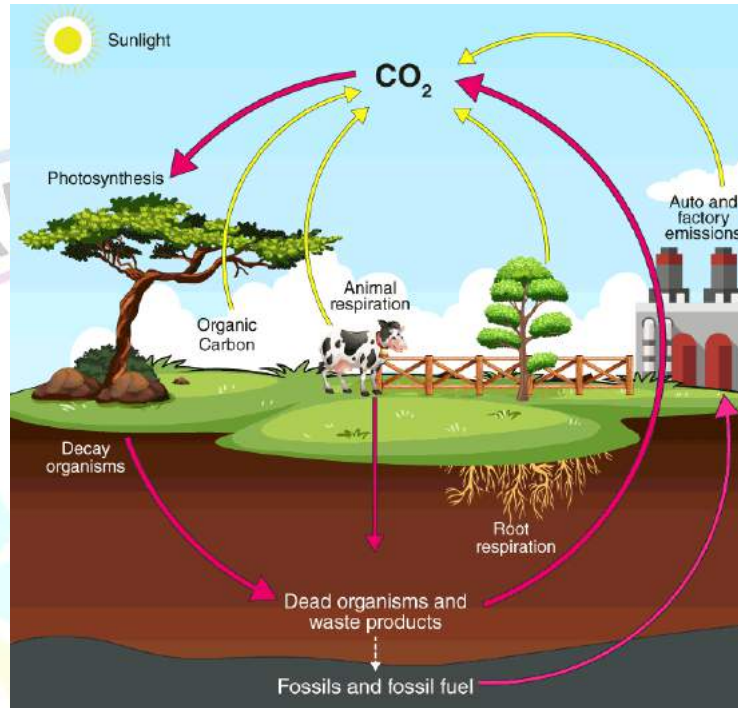
- Malaria is a life-threatening disease caused by parasites transmitted through the bites of infected female Anopheles mosquitoes.
- There are five parasite species that cause malaria in humans, with Plasmodium falciparum and Plasmodium vivax posing the greatest threat. Malaria is common in tropical areas with hot and humid climates, and children under five years of age are the most vulnerable group affected by the disease.
- Cabo Verde has become the third country in the WHO African region to be certified as malaria-free. The country joins Mauritius and Algeria, which were certified in 1973 and 2019, respectively. This achievement reflects Cabo Verde's successful efforts in malaria control and elimination.
- In 2022, India accounted for a staggering 66% of malaria cases in the WHO South-East Asia Region. Plasmodium vivax, a protozoal parasite, contributed to almost 46% of cases in the region.
- Despite a 55% reduction in cases since 2015, India remains a significant contributor to the global malaria burden. India faces challenges, including a surge in cases in 2023 linked to unseasonal rainfall. India and Indonesia accounted for about 94% of all malaria deaths in the WHO South-East Asia Region.

19. Ans : D

### **CARBON CYCLE SUMMARY:**

- Process: Carbon is exchanged among the Biosphere, Geosphere, Pedosphere, Hydrosphere, and Atmosphere.
- Oceans: Contain about 70% of global carbon, holding more carbon than the atmosphere.

- CO<sub>2</sub> Reaction: CO<sub>2</sub> reacts with ocean water to form carbonic acid, which dissociates into bicarbonate and carbonate ions.
- Stability: Bicarbonate and carbonate ions make carbon less likely to escape the ocean.



- Carbon Fixation: Approximately  $4 \times 10^{13}$  kg of carbon is fixed annually through photosynthesis.
- Impact of Elevated CO<sub>2</sub>:
  - Increases carbon availability in leaves.
  - Enhances Rubisco activity and photosynthesis rates.
  - Leads to higher carbohydrate content, greater starch reserves, and increased auxin biosynthesis.
  - Results in increased biomass and CO<sub>2</sub> fixation.

20. Ans : D

### **What is a Mangrove Ecosystem?**

- An ecotone between land and sea ecosystems
- One of the most productive and biologically diverse ecosystems on the planet

### **Characteristics of Mangrove Forests**

- Grow in a variety of depths of salt water
- Roots stick up out of the mud
- Home to fish, crustaceans, and other species

### **Importance of Mangrove Forests**

- Coastline stabilization





- Reduces erosion from waves and tides
- Water purification
- Water recharge
- Carbon sink

### **Distribution of Mangrove Forests**

- Mainly found in tropical and subtropical inter-tidal regions
- Between approximately 32° N and 38° S latitudes
- Cannot withstand freezing temperatures

### **Mangrove Cover in India**

As per Indian Forest Survey Report 2021

- 0.15% of India's total geographical area
- Very dense mangrove: 29.55%
- Moderately dense mangrove: 29.67%
- Open mangroves: 40.78%

### **Threats to Mangrove Forests**

- Shrimp farming - Channels dug to supply ponds with freshwater and seawater + Alters natural flow of water, harming surrounding mangroves

**21. Ans : D**

### **What is Adaptation?**

- Any attribute of an organism (morphological, physiological, behavioral) that enables it to survive and reproduce in its habitat
- Many adaptations have evolved over a long evolutionary time and are genetically fixed

### **Adaptations for Water Requirement in Desert Animals**

Internal Fat Oxidation

- Water is obtained as a by-product
- Lipids (fat) produce twice as much oxidized water per gram as carbohydrates (starch)
- Starch produces 20% more water than fat per kilocalorie due to greater demand for oxygen for fat metabolism
- In dry environments, starch is a better substrate for water production than fat

Concentrating Urine

- Minimal volume of water is used to remove excretory products
- Helps conserve water in desert animals

Burrowing Underground

- Desert animals burrow underground during the day to avoid extreme temperatures
- Come out at night to eat, reducing water requirements

**22. Ans : C****What is an Ecological Pyramid?**

- A graphical representation showing the relationship between different organisms in an ecosystem

Types of Ecological Pyramids

- Pyramid of number
- Pyramid of biomass
- Pyramid of energy

Characteristics of Ecological Pyramids

- A given organism can occupy more than one trophic level simultaneously
- Example: Sparrow as primary and secondary consumer
- Ecological pyramids do not account for same species belonging to multiple trophic levels

Trophic Levels in Ecological Pyramids

- Saprophytes play a significant role in the food chain but are not included in trophic levels

Pyramid of Energy

- Always upright, never inverted
- Energy lost as heat at each step when flowing from one trophic level to the next

**23. Ans : B**

- Endotherms are animals that use thermoregulation to maintain a somewhat consistent internal body temperature even when their external environment changes. All birds and mammals and a very few lower vertebrate and invertebrate species are indeed capable of such regulation (thermoregulation and osmoregulation) without being dependent on any external sources.
- Ectotherms (cold-blooded animals) are animals whose regulation of body temperature depends on external sources, such as sunlight or a heated rock surface. Examples include fishes, amphibians, reptiles, and invertebrates. Amphibians and reptiles are ectothermic and rely on environmental sources to gain heat. Reptiles use the heat from the sun to warm themselves

**24. Ans : B**

- No energy that is trapped in an organism remains in it forever.
- As the organism dies, the energy trapped by it (producer) is either passed on to a consumer or constitutes the beginning of the detritus food chain/web.
- Also, the amount of energy decreases at successive trophic levels.
- In Grazing Food Chain (GFC), the starting point of the food chain are the producers i.e. plants and the first energy transfer which is gained from photosynthesis is from plants to herbivores, whereas, in Detritus Food Chain (DFC), the food chain begins with dead organic materials (detritus) which are consumed by detritivores or decomposers.
  - GFC is the major conduit for energy flow in aquatic ecosystems.



- DFC constitutes a much larger fraction of energy flows in the terrestrial ecosystem.

### 25. Ans : C

- Biodiversity is the variation among living organisms from different sources including terrestrial, marine and desert ecosystems, and the ecological complexes of which they are a part.
- An ecosystem that has not witnessed many changes will eventually have higher biodiversity. Old and stable ecosystems like rain forests have high diversity while the Arctic has undergone many changes and this does not allow many species to establish themselves there.
- A complex community offers a greater variety of niches than a simple community and promotes greater diversity. Hence, the higher the ecological niches, the higher the degree of biodiversity.
- A higher degree of stress such as temperature, and pressure will lead to greater habitat stress and hence lesser presence of diversity such as the Antarctic, desert ecosystem etc.

### 26. Ans : B

- RECENTLY, Kerala forest department released a report in which they brought out the wide area which is covered by invasive Lantana camara, Senna spectabilis, Mimosa pudica, etc. These species such as are threatening the native species of the forest.
- Senna spectabilis is a hardy tree. It is also spreading very fast and threatening protected areas of Kerala.

### 27. Ans : D

#### SHOLA FORESTS

- Tropical Montane forest patches found within valleys separated by grasslands
- Generally located in higher altitudes

#### Location of Shola Forests

- Upper Western Ghats of India
- Native to Southwestern Ghats
- Found in high mountains of Kerala, Tamil Nadu, and Karnataka

#### Characteristics of Shola Forests

- Made up of evergreen native trees that are dwarf in nature
- Hill slopes covered with native grass species
- Double-layered vegetation with a closed canopy
- Often covered by permanent cloud cover due to high humidity levels

#### Classification of Shola Forests

- Lower montane cloud forest or upper montane cloud forest depending on elevation



### Functions of Shola Forests

- High water retention capacity
- Absorb and retain rainwater within soil
- Grassland allows rainwater to flow through sholas into streams

### Importance of Shola Forests

- Harvests rain from Southwest and Northeast monsoons
- Contributes to formation of Bhavani river, which drains into Cauvery
- Supports prosperity of Cauvery delta farmers

### 28. Ans : D

- Researchers in Kerala discovered a new species of bee, named Apis Karinjodian, in the Western Ghats. This new species has also been named the "Indian black honey bee" due to its distinctly dark appearance.
- The new species has been classified by the International Union for Conservation of Nature (IUCN) as 'near threatened' .
- Indian black honey bees range from the central Western Ghats and Nilgiris to the southern Western Ghats, covering the states of Goa, Karnataka, Kerala, and parts of Tamil Nadu.
- The last discovery of a honey bee in India, Apis indica, was made in 1798 by the Danish entomologist Johan Christian Fabricius.
- Along with the Apis Karinjodian, there are a total of 11 species of cluster honey bees in the world.

### 29. Ans : B

- Lakes are divided into three categories: oligotrophic, mesotrophic and eutrophic. The oligotrophic lake is a large, deep lake with clear waters and a rocky or sandy shoreline. A eutrophic lake is typically shallow with a soft and muddy bottom. Mesotrophic is an intermediate state with characteristics between the other two.
- A eutrophic lake will have the following characteristics:
  - High nutrient enrichment
  - Significant planktonic growth (high productivity)
  - Extensive aquatic plant beds
  - Much sediment accumulation on bottom
  - Low dissolved oxygen on bottom
  - Only warm water fish species



**30. Ans : D**

### **KELP FORESTS**

- Underwater ecosystems formed in shallow water by dense growth of kelp species
- Kelp are large brown algae, not plants

#### Characteristics of Kelp Forests

- Thrive in cold, nutrient-rich waters
- Rely on sunlight to generate food and energy
- Always coastal, requiring shallow and relatively clear water

#### Location of Kelp Forests

- Found in temperate and polar latitudes, not restricted to tropical latitudes
- Ideal location: eastern Pacific Ocean along west coast of North America
- Presence of upwelling brings cold water and nutrients to surface
- Found on coast of every continent except Antarctica

#### Importance of Kelp Forests

- Foundation species creating complex habitats for associated organisms
- Fundamental to structure and resilience of terrestrial and marine ecosystems
- Provide large areas of habitat within the ocean

#### Biodiversity in Kelp Forests

- Provide underwater habitat to various species of: Invertebrates, Fishes, Other algae
- Support large predatory species of: Sharks, Marine mammals

**31. Ans : C**

**32. Ans : B**

**33. Ans : C**

**34. Ans : D**

**35. Ans : B**

**36. Ans : D**

**37. Ans : B**

**38. Ans : A**

**39. Ans : C**

**40. Ans : B**

**41. Ans : D**

The Bengaluru Darshini service was launched by BMTC in 2015 by renaming the hop-on-hop-off buses. For a price of ₹400 for an adult and ₹300 for a child, with a service charge of ₹15, a Volvo bus takes tourists to several landmarks in Bengaluru starting from Kempegowda bus stand.

**42. Ans : A**

- Dengue is a self-limiting febrile illness with symptoms ranging from asymptomatic to severe.
- Dengue is a mosquito-borne tropical disease caused by the dengue virus (Genus Flavivirus), transmitted by several species of female mosquito within the genus Aedes, principally Aedes aegypti.
- This mosquito also transmits chikungunya and Zika infection.
- The dengue vaccine CYD-TDV or Dengvaxia was approved by the US Food & Drug Administration in 2019, the first dengue vaccine to get the regulatory nod in the US.

**43. Ans : C**

KSTDC is set to launch a unique 'horti-tourism' initiative, capitalising on the growing popularity of ecotourism and agri-tourism.

**HIGHLIGHTS**

- Goa and Maharashtra are leaders in wine tourism and agri-tourism nationally.
- Shedehalli Horticulture Farm in Belagavi's Khanapur was initially envisioned as Karnataka's first horti-tourism hub.
- Implementation Details and Timeline: - Approximately six to seven months needed for planning and infrastructure setup at existing farms + Identification of four existing farms for the initial phase
- Objective is to educate youngsters on traditional and modern plantation farming methods
- Plan to cultivate desi species like sapota and guava alongside exotic species.
- Selected Farm and Facilities:
  - Thippagondanahalli farm on Bengaluru-Tumakuru highway chosen for horti-tourism.
  - Basic facilities like washrooms and eateries ensured for visitors.
- Management and Visitor Engagement:
  - Horticulture Department to manage farms and fruit plucking, while KSTDC ensures visitor experience.
  - Focus on educating visitors about plantations and allowing them to pick fruits and vegetables

**44. Ans : C**

- Tirthahalli Areca Emerges as Best Variety in Karnataka
- Areca Research Analysis was conducted by Areca Research Centre at Keladi Shivappa Nayaka University of Agricultural and Horticultural Sciences in Shivamogga and a comparative analysis among different areca varieties grown in Karnataka.

**India's Role**

- Production: India is the largest producer of arecanut globally.
- Consumption: It's also the largest consumer of arecanut.

**45. Ans : B**

- A recent statistic of Plastic Waste Management in Karnataka released
- Recycling Statistics: Only 57% of plastic waste generated in Karnataka is recycled.
- 988.44 tonnes of plastic waste is generated daily, with 733.47 tonnes (74.2%) collected and 324.29 tonnes processed annually.
- Policy and Enforcement: Karnataka implemented Plastic Waste Management Rules in March 2016, banning carry bags. The state faces challenges with illegal manufacturing units and import of banned materials. Karnataka State Pollution Control Board (KSPCB) has booked 54,000 cases in its efforts.

**46. Ans : A**

- Horticulture Department of Karnataka Plants the Seed for an Herbarium at Lalbagh
- WHAT IS AN HERBARIUM - A herbarium is a collection of preserved plant specimens and associated data used for scientific study
- Record Keeping: This documentation will help maintain records of existing species and determine the age of trees, especially those at risk due to weather factors
- Future Publications: The Horticulture Department plans to publish a series of books titled "Plant Wealth of Lalbagh,"

**47. Ans : B****48. Ans : B****49. Ans : D****50. Ans : A**



51. Ans : B

52. Ans : A

53. Ans : D

54. Ans : D

55. Ans : C

56. Ans : C

57. Ans : B

58. Ans : A

59. Ans : D

60. Ans : B

- Agumbe, in the Western Ghats is known as the Cherrapunji of the South because it receives the highest rainfall in Karnataka.
- Hulikal of Hosanagar taluk, Shivamogga, said to be the wettest place in the state

61. Ans : C

- Karnataka lies to south of Tropic of Cancer and hence is part of Tropical zone
- The zone is nearer to the equator and therefore experiences high temperatures throughout the year with a small daily and annual range
- The state enjoys the benefit of both southwest and northeast monsoons and hence it will be called the land of two monsoons. Karnataka bears influence of both Arabian sea and the Bay of Bengal
- Larger area of Karnataka has dry steppe type of climate

62. Ans : A

Lake Kariba is the world's largest artificial lake and reservoir by volume. It lies 1,300 kilometres (810 mi) upstream from the mouth of the Zambezi river on the Indian Ocean, along the border between Zambia and Zimbabwe. Lake Kariba was filled between 1958 and 1963 following the completion of the Kariba Dam at its northeastern end, flooding the Kariba Gorge on the Zambezi River.



**63. Ans : A**

The Ministry of Women and Child Development introduced 'Aadharshila,' a 48-week curriculum for children aged three to six years in anganwadis, aligning with the National Education Policy 2020 and focusing on fundamental skills development through play-based learning.

**64. Ans : D****65. Ans : A****66. Ans : D**

- Y S Siddegowda committee recommendations to be adopted by Karnataka govt to reform the university education.
- Karnataka govt to introduce common calendar, fee structure and evaluation process in public universities
- Constituted by Karnataka State Higher Education Council

**67. Ans : B**

Justice Nilay Vipinchandra Anjaria took oath as the 34th Chief Justice of Karnataka High Court

Chief Justice of High Courts in India

Aspect	Details
Establishment	Article 217: Establishes the post
Appointment	By the President, in consultation with the Chief Justice of India (CJI) and the Governor
Policy	Chief Justices from outside the respective States
Qualifications	Citizen of India, 10 years in judicial office or as a High Court advocate
Tenure	Until age 62
Resignation/Removal	By writing to the President; can be removed by the President on Parliament's recommendation

**68. Ans : A****LEGISLATIVE DEVELOPMENTS IN KARNATAKA**

*Karnataka Souharda Cooperative (Amendment) Bill-2024*

- Introduces reservation matrix for members from Scheduled Castes, Scheduled Tribes, and Other Backward Classes

*Karnataka Cooperative Societies (Amendment) Bill, 2024*

- Seeks to provide equal voting rights to all members
- Abolishes Karnataka Cooperative Election Authority



- Creates Election Department under Director of Cooperative department

### **REGULATION OF COOPERATIVE SOCIETIES IN INDIA**

- Regulated by both state and central governments
  - Multi-state cooperative societies governed by Multi-State Cooperative Societies Act, 2002
  - Each state has its own cooperative societies act for societies operating within the state
- Principles of Cooperative Societies
- Democratic control through one-member-one-vote principle
  - Each member has one vote, regardless of capital contribution or number of shares held
- Tax Status of Cooperative Societies
- Not all cooperative societies are exempt from paying income tax
  - Tax status depends on nature of society and its activities
  - Some types of cooperative societies enjoy tax benefits

#### **69. Ans : B**

- Governor Thaawarchand Gehlot appointed Principal Secretary (Law, Justice & Human Rights) G S Sangreshi as the new Karnataka State Election Commissioner (SEC).
- They have the same security of tenure as a High Court judge and can only be removed through a process similar to that of removing a High Court judge.
- The State Election Commissioner is responsible for conducting elections to local bodies such as panchayats and municipalities. However, elections for the state legislature are conducted by the Election Commission of India, not the State Election Commissioner.

#### **70. Ans : B**

#### **ASHA KIRANA**

- Chief Minister of Karnataka launched 'Asha Kirana' scheme
- Free door-to-door eye care check
- Tagline: 'Asha Kirana – Eye Care at Your Doorstep'
- Under National Programme for Control of Blindness and Visual Impairment and National Health Mission
- Services: Primary eye checkups by health personnel and ASHA workers at homes + Referrals to PHCs for secondary screening + Free spectacles after examination by ophthalmologists at PHCs + Free cataract surgeries at government hospitals and registered voluntary organizations
- Successfully implemented in four districts: Haveri, Kalaburagi, Chikkaballapur, Chamarajanagar
- Phase-2 implementation: Chitradurga, Mandya, Raichur, Uttara Kannada

**71. Ans : B****KRISHI BHAGYA SCHEME EXPANSION**

- State government set to expand scope of Krishi Bhagya scheme
- Issue Addressed: Severe drought.
- Objective: Sustainability of farm activities.
- Strategy: Store rainwater in farm ponds.
- Scope Expansion: Now includes all 236 taluks across 31 districts.
- Farm Pond Targets: 30,000 to 40,000 farm ponds planned.
- Initial Allocation: ₹200 crore + Financial Requirement: Expected to exceed allocation.

**About the Scheme:**

- Inception: Launched in 2014-15.
- Focus: Drought-prone areas + Achievements: 2,89,827 farm ponds built.
  - Main Components: Farm ponds, polythene lining, fences, pumps, drip/sprinkler irrigation.
  - Subsidy: Provided for all components.

**72. Ans : B**

- Soligas Tribe are an isolated tribal community restricted to only Karnataka & Tamil Nadu (especially in Biligiri Rangana Hills and Male Mahadeshwara Hills).
- Popularly known as Soliga/Sholiga/Soligaru - called the children of bamboo because the word is believed to mean that they originated from bamboo
- Their settlements are known as 'haaDi' and 'pooDu'.
- To recognise the efforts of the Soliga Community in biodiversity and conservation, a new genus of wasp, 'Soliga Ecarinata,' has been after them.
- Soligas became the first tribal community living inside a tiger reserve to get legal rights to the forest in 2011.

**73. Ans : C**

- A team of naturalists recently documented a new spider species named 'Ligdus Garvale' from Garvale, a village nestled in the Somwarpet taluk of the Kodagu district, Karnataka.
- It is a new species of jumping spider
- It marks only the second recorded instance of the Ligdus genus in 129 years.
- The first, Ligdus Chelifer, was reported from Myanmar by Thorell in 1895.
- Ligdus Garvale was discovered under the leaf of a torch ginger plant and bears a resemblance to Pseudoscorpions.
- Due to its nature as a high canopy jumper, it often goes unnoticed and constructs a double-layered web for retreat.

**74. Ans : A****MILLETS IN KARNATAKA**

- 5th Millets and Organics International Trade Fair Karnataka held
- Karnataka's Millet Production: 40% of India's millet production. + Exported 7,764 tonnes of millets and value-added products in 2022-23.
- Major products exported: sorghum, jowar, ragi, and related products.
- Key Millet Districts: Ballari, Koppal, Bengaluru Rural, Haveri, and Chitradurga.
- Export Destinations: U.S., Australia, UAE, Canada, Qatar, Thailand, and Singapore.
- Goal: Doubling millet exports.

**75. Ans : C****NATIONAL PARKS IN KARNATAKA**

- Bandipur National Park: Known for its tiger reserve, Bandipur National Park is part of the Nilgiri Biosphere Reserve and is located in the Chamarajanagar district.
- Bannerghatta National Park: Located near Bangalore, it is known for its zoological reserve, safari, and a butterfly park.
- Nagarhole National Park (Rajiv Gandhi National Park): Located in the Kodagu and Mysore districts, Nagarhole is part of the Nilgiri Biosphere Reserve and is known for its rich biodiversity.
- Kudremukh National Park: Located in the Western Ghats, it is known for its unique landscape and diverse flora and fauna.
- Anshi National Park: Located in the Uttara Kannada district, it is part of the Anshi Dandeli Tiger Reserve and is known for its rich biodiversity.

**76. Ans: A****MYSORE PAINTS AND VARNISH LTD**

- Establishment: 1937 by Maharaja Krishnaraja Wadiyar IV
- Notable Contributions:
  - Major supplier of security inks to RBI
  - Produces inks for currency notes, passports, and secure documents
- Public Sector Transition:
  - Became a public sector company in 1947
- Indelible Ink Production:
  - Selected in 1962 to manufacture indelible ink, used first in India's third general election

**77. Ans : B**

Usha Hegde, a professor at JSS Dental College in Mysuru, etched history by becoming the first civilian from Karnataka to scale Mount Everest

**78. Ans : C**

- Radar (Radio Detection and Ranging) technology uses radio waves to detect objects and determine their distance, speed, and direction by analyzing the reflected signals.
- Weather radars are used to track hurricanes, can detect various atmospheric phenomena, including rainfall, snowfall, hail, and other forms of precipitation.
- Ground-penetrating radar (GPR) is a non-invasive method commonly used in archaeology to locate buried artifacts, structures, and features without the need for excavation. It sends radar pulses into the ground and analyzes the reflected signals to create images of subsurface objects.

**79. Ans : C**

Kannada Movie 'Kenda' Selected For 14th Dada Saheb Phalke Film Festival

**80. Ans : D**

- Yakshagana originated in the coastal regions of Karnataka, primarily in South Kanara and Udupi districts. It's also popular in parts of Kerala and other regions of Karnataka.
- Historical Background: The art form dates back several centuries, with some scholars tracing its origins to the 16th century. It has evolved over time, incorporating various local traditions and styles.
- Performance Style: It's a unique blend of dance, music, dialogue, costume, make-up, and stage techniques. Performances are typically open-air and can last all night.
- Themes: Most stories are derived from Hindu epics like Ramayana, Mahabharata, and Bhagavata. Historical and mythological tales are common themes.
- The lead singer, called the "bhagavata," also acts as the director of the performance.
- Two main styles: Badagu Thittu (northern style) and Thenku Thittu (southern style). These differ in costume, music, and performance techniques.

**81. Ans : D****FISCAL SITUATION IN KARNATAKA**

Karnataka's Fiscal Performance Insights:

- Major fiscal parameters in Karnataka have shown positive trends compared to the 'all states' average, maintaining a revenue surplus until the Covid-19 pandemic.
- In 2023-24, Karnataka's STR to RE ratio is 74%, higher than the All States Average of 57.10%, with lower non-developmental expenditure to aggregate disbursement at 25.50% compared to the All State Average of 27.20%.

Comparison with Southern States:

- Karnataka outperforms other southern states with the lowest fiscal deficit of 2.50% in 2023-24, compared to Telangana (4.0%), Andhra Pradesh (3.80%), Kerala (3.40%), and Tamil Nadu (3.40%) with higher deficits.

- Karnataka's net market borrowings are negative (-2102.00 crores), indicating prudent fiscal management compared to other southern states with positive net borrowings.

Factors Contributing to Fiscal Performance: Rationalization of public expenditures and efficient utilization of State Tax Revenue

**82. Ans : B**

Karnataka is the first state to engage Corporate Social Responsibility (CSR) for SDGs. A CSR matchmaking platform – Akanksha - to align CSR commitments to SDGs has been created and functioning.

**83. Ans : A**

KARNATAKA COMPARED WITH INDIA				
Sl. No.	Item	Unit	Karnataka	India
Population as per 2011 Census				
1	Total	'000s	61095	1210570
2	Males	-do-	30967	623122
3	Females	-do-	30128	587448
4	Rural Population	-do-	37469	833463
5	Percentage of Rural Population to total population		61.33	68.85
6	Urban Population	'000s	23626	377106
7	Percentage of Urban Population to total population		38.67	31.15
8	Sex Ratio	Females per 1000 Males	973	943
9	2001-2011 Decadal Growth of Population	Percent	15.60	17.70
10	Literacy Rate	Percent	75.36	73.00
11	Population of SC/ST (2011 population Census)	'000s	14724	305633
12	Total Workers (2011 Census)	-do-	27873	481743
13	Geographical Area (2011Census)	Lakh Sq.Kms.	1.92	32.87
14	Net Area sown 2020-21	'000 ha.	11453	141544
15	Gross Cropped Area 2020-21	-do-	14910	216107
16	Gross Irrigated 2020-21	-do-	6064	118934
17	% of Gross Irrigated Area to Gross Cropped Area 2020-21		40.6	55.03

**84. Ans : B**

- e-JanMa is used for the registration of births and deaths, helping to digitize and streamline this important civil registration process.
- e-SAKSHI is a web portal developed by the Government of India for implementing the revised fund-flow procedure under the Member of Parliament Local Area Development (MPLAD) scheme.
- Karmani is a web application used to record information about transgender individuals through a state survey, including their numbers and related details.
- The Spectacles App is associated with the National Health Mission.

**85. Ans : C**

- Government has introduced the Karnataka Legislator's Local Area Development Scheme (KLLADS) in 2001-02 with Rs.25.00 lakh per constituency.
- The allocation has been enhanced from Rs.25.00 lakh to Rs.1 Crore per Legislature constituency from 2006-07. Further this amount has been enhanced to Rs.2 crore lakh per constituency from 2013-14.
- In order to accommodate local aspirations and needs and to ensure responsive planning and delivery of services, the Government has taken up schemes for asset creation, infrastructure development and employment generation for the benefit of the poor and weaker sections, whose planning and execution can be done at the Legislator's Constituency Level.
- The KLLADS follows a participatory demand responsive development approach to address infrastructure development requirements of the local area within a Legislator's Constituency. It also provides flexibility in taking up works which are otherwise not covered by other government programs.

**86. Ans :C**

- National Academic Depository (NAD) is an initiative by the Ministry of Education (MoE) to provide a 24X7 online depository to Academic institutions to store and publish their academic records (Marksheet, Caste certificates).
- The digital depository not only ensures easy access to and retrieval of an academic award but also validates and guarantees its authenticity and safe storage.
- Karnataka ranks No. 1 for implementing NAD in the country by uploading 5+ cr records on NAD.
- Exclusive templates are designed from Karnataka for boards like Department of Technical Education (DTE), Medical universities and Agricultural universities and made available on NAD

**87. Ans : A****GENDER INEQUALITY INDEX IN INDIA**

- Loss due to inequality is lowest among the districts Udipi, Uttara Kannada, Dakshina Kannada, Kodagu and Gadag.
- Dharwad district had highest gender inequality. Bengaluru Rural, Belgaum and Tumkur are the next three districts with high gender inequality index.
- Bengaluru urban stands at 7th position with GII being 0.322 indicating 32% loss in achievement across three dimensions due to gender inequality.

88. Ans : B

**Table 11.11.10: Life Expectancy in Karnataka, 2012-16 to 2016-20**

Years	Total		
	Karnataka	India	Difference in Years
2012-16	69.1	68.7	0.4
2013-17	69.2	69.0	0.2
2014-18	69.4	69.4	0
2015-19	69.5	69.7	-0.2
2016-20	69.8	70.0	-0.2

Source: Office of the Registrar General of India, Various Years, Abstracts

89. Ans : A

Chethana: To improve the situation of the sex workers to lead a respectful life in the society the Corporation provides self-employment training and also an incentive of Rs.30,000/- to take up income generating activities.

90. Ans : A

- Karnataka is the first State in the country to bring out District Human Development reports for all the 30 districts in the state simultaneously with assistance of the Zilla Panchayaths in 2014.
- The third Karnataka State Human Development Report-2015 was brought out in 2018 with a specific theme on “Accelerating Equitable Human Development”. The approach was to assess inclusiveness of human development across caste, class, gender, regions and social groups and accelerate the process.
- The Fourth Karnataka State Human Development Report-2022 is brought out in 2023 with a theme “Bridging the Gaps towards sustainable wellbeing”. The report is being presented with a specific action-oriented agenda to reach the human development milestones in Sustainable Development Goals.





**91. Ans : C**

**STATE WATER POLICY 2022**

- Ensuring water security for the entire population by:
  - Providing clean, accessible, and safe water for drinking and domestic use
  - Securing sustainable water supply for agriculture and other uses
  - Establishing appropriate institutional and legal frameworks
- Improving efficiency of urban and rural water supply and industrial water use through:
  - Implementing 24/7 water supply schemes
  - Reducing non-revenue water and losses
  - Promoting water recycling and treatment
  - Enforcing metering and tariff systems
- Enhancing irrigation water efficiency in agriculture and livestock by:
  - Modernizing reservoir and irrigation systems
  - Implementing efficient irrigation technologies
  - Promoting participatory irrigation management
- Improving watershed and water body health through:
  - Integrated watershed management
  - Conservation and protection of water bodies
  - Regulating land use around water bodies
- Moving towards sustainable groundwater management by:
  - Developing water security plans at Gram Panchayat level
  - Focusing on base flows and addressing river issues
- Improving water governance through:
  - Integrating efforts of all concerned institutions
  - Building capacity of government and non-government institutions
  - Ensuring equitable water sharing
  - Implementing financing and water charging systems
- Managing water resources using an integrated approach by:
- Recognizing river basins as management units
- Coordinating policies across water-using sectors
- Involving women in water resource management

**92. Ans : C**

**DAM REHABILITATION AND IMPROVEMENT PROJECT (DRIP)**

- DRIP was launched in 2012 by the Central Water Commission with World Bank funding.
- The CWC (Central Water Commission) had been entrusted with overall coordination and supervision.



- A web-based tool called Dam Health and Rehabilitation Monitoring Application (DHARMA) has been developed to capture important data for all dams.
- To improve the safety and performance of selected existing dams and associated appurtenances in a sustainable manner.
- To strengthen the dam safety institutional setup in participating states as well as at the central level.
- To explore the alternative incidental means at few selected dams to generate the incidental revenue for sustainable operation and maintenance of dams.

**93. Ans : A**

Pashchima Vahini: Vented dams are constructed under “PaschimaVahini” project to collect and store water flowing in west-flowing rivers of coastal districts. A total of 54 works have been approved under the scheme, with an estimated cost of Rs.374.00 crore.

**94. Ans : A**

- Karnataka Data Centre Policy 2022-27 The Government has brought out a dedicated Data Center Policy-2022-27 with a vision to become a ‘Destination of Choice’ for futuristic data centres and an integral part of the global data centre ecosystem, also to create a robust digital infrastructure in Karnataka in line with overarching mission to lead the world in the ‘Digital Industrial Revolution’ and use of big data, high computing capacity, etc.
- The policy has adopted a three-fold strategy to achieve a low carbon footprint renewable energy source-based powering of data centres:
  - promote emerging tech clusters,
  - ease of doing business for establishment of data centres and
  - provide an enabling environment for data management, security, transaction, and storage services to the emerging technology industries.
- The Policy offers support through various incentives and offerings to Data Centre industry located within the State. The policy targets to develop more than 200 MW capacity Data Centre Industry in Karnataka and attract approximately INR 10,000 Crores investments during the policy period.

**95. Ans : C**

**BIOECONOMY**

- Karnataka's BioEconomy grew by 10.7% from 2022 to 2023, reaching \$31 billion in economic value.
- This growth reflects a positive trend in economic activity and overall expansion in Karnataka's BioEconomy sector.



- In 2022, Karnataka held a 20.45% share of India's National BioEconomy (\$137 billion), which increased to 20.52% in 2023 with the National BioEconomy growing to \$151 billion.
- Karnataka ranks second in National BioEconomy revenue, after Maharashtra, followed by Telangana and Gujarat

96. Ans : B

97. Ans : C

98. Ans : B

99. Ans : C

100. Ans : C





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