Q.1) With reference to GROWTH –India Telescope, consider the following statements?

1. It is India's first robotic telescope.
2. It is part of the international GROWTH (Global Relay of Observatories) Watching Transients Happen) network.

Which of the above statements is/are correct?

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

Q.1) Solution (c)

Statement analysis

Statement 1: **GROWTH-India is India's first fully robotic optical research telescope**. This was constructed as a joint partnership between the Indian Institute of Astrophysics and the Indian Institute of Technology Bombay, with support from DST-SERB and IUSSTF. The primary research focus of this telescope is time domain astronomy: the study of explosive transients and variable sources in the universe.

- The telescope is located at the Indian Astronomical Observatory site at Hanle, Ladakh. Situated at 4500 meters above mean sea level, this is one of the highest observatory sites in the world and one of the best telescope locations in the country.
- It is mainly an imaging telescope.
- It is 70m telescope with a primary focus on time domain astronomy.

Statement 2**: it is a part of the international GROWTH network:** a Global Relay of Observatories Watching Transients Happen. Together with various partners around the world, it continuously monitor any interesting object in the sky - uninterrupted by daylight.

- The GROWTH initiatives focuses on three scientific themes in the field of time-domain astronomy –cosmic explosions (supernova), small near earth asteroids and the electromagnetic identification of gravitational wave sources.

Q.2) Consider the following statements:

a) Bepicolombo is a joint mission of NASA and European space agency to explore Mercury.

b) Parker Solar Probe is first to fly in Sun's direct atmosphere called Corona.
c) Tiangong-2 is China's first Mars exploration mission.

Which of the above statements is/are correct?

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

Q.2) Solution (c)

Explanation:

Statement 1: BepiColombo is Europe's first mission to Mercury, the smallest and least explored terrestrial planet in our Solar System.

- It is a joint endeavour between ESA and the Japan Aerospace Exploration Agency, JAXA, and consists of two scientific orbiters: ESA's Mercury Planetary Orbiter (MPO) and JAXA's Mercury Magnetospheric Orbiter (MMO). (So, statement 1 is incorrect.)
- The mission will study all aspects of Mercury, from the structure and dynamics of its magnetosphere and how it interacts with the solar wind, to its internal structure with its large iron core, and the origin of the planet's magnetic field. It will make global maps of the surface elemental and chemical composition and image features to better understand geological processes and how the surface has been modified over time by impact craters, tectonic activity, volcanism and polar ice deposits.
- The data will enable scientists to understand more about the origin and evolution of a planet located close to its parent star, and a better understanding of the overall evolution of our Solar System.

Statement 2: NASA's Parker Solar Probe is the first-ever mission to "touch" the Sun. It is part of NASA's "Living With a Star" programme that explores different aspects of the Sun-Earth system.

- The spacecraft, about the size of a small car, travels directly through the Sun's atmosphere --ultimately to a distance of about 4 million miles from the surface.
- The mission's central aim is to trace how energy and heat move through the Sun's corona and to study the source of the solar wind's acceleration.
- The mission is likely to last for seven years during which it will complete 24 orbits.
- **It is first to fly direct into the outermost atmosphere of Sun known as Corona.**

Statement 3: **Tianwen -1 is China's first Mars exploration mission.** Mission includes an orbiting spacecraft, landing craft and a detachable rover to roam the Martian surface. Tiangong-2 was a Chinese space laboratory and part of the Project 921-2 space station program. (**So, statement 3 is incorrect.)**

Q.3) Consider the following statements about Sun Spots Cycle:

1. Sunspot is an area on the Sun that appears dark on the surface and is relatively cooler than surrounding parts.
2. Sunspots usually appear in pairs of opposite magnetic polarity.

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

Q.3) Solution (c)

Explanation:

Statement1**: A Sunspot is an area on the Sun that appears dark on the surface and is relatively cooler than surrounding parts.** These spots, some as large as 50,000 km in diameter, are the visible markers of the Sun's magnetic field, which forms a blanket that protects the solar system from harmful cosmic radiation.

- On the photosphere– the outer surface of the Sun which radiates heat and light– Sunspots are the areas where the star's magnetic field is the strongest; around 2,500 times more than the Earth's magnetic field.
- Most Sunspots appear in groups that have their own magnetic field, whose polarity reverses during every solar cycle, which takes around 11 years. In every such cycle, the number of Sunspots increases and decreases.
- **Sunspots usually appear in pairs of opposite magnetic polarity.**
- Larger sunspots can be visible from Earth without the aid of a telescope.

Why Sunspots appear dark?

Because Sunspots have high magnetic pressures, the atmospheric pressure in the surrounding

photosphere reduces, inhibiting the flow of hot gases from inside the Sun to the surface.

- Due to this, the temperatures of Sunspots are thousands of degrees lower than the surrounding photosphere, which has a temperature of 5,800 degrees Kelvin. Sunspots temperatures are around 3,800 degrees Kelvin.
- Because they stop the convective flow of heat and light, Sunspots appear dark. They typically consist of a dark region called the 'umbra', which is surrounded by a lighter region called the 'penumbra'.

Q.4) Consider the following statements about Infectious disease diagnostic lab.

1. It is India's first Mobile testing Lab which is part of Atmanirbhar Bharat.
2. It has been launched by Ministry of Science & Technology.

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

Q.4) Solution (c)

Explanation

I-Lab (Infectious disease diagnostic lab)

- **It is india's first mobile testing facility launched under Atmanirbhar Bharat.**
- It **is supported by Department of Biotechnology under Ministry of Science and Technology**
- This mobile testing facility will be deployed through the DBT testing hubs to remote regions of the country for Covid testing.
- The unique feature of these mobile testing labs is their utility in diagnosing other infectious diseases beyond the Covid period.
- The labs will be provided to the regional/City hubs and they will deploy it further in the interior, inaccessible parts of the region.

Q.5) For which of the following diseases Vaccines are available?

1. Diptheria
2. Tetanus
3. Polio
4. Measles
5. Hepatitis A

Select the correct code

a) 1, 2, and 3 only
b) 2, 3 and 4 only
c) 1, 2, 3 and 4 only
d) All of the above

Q.5) Solution (d)

Explanation:

Vaccines are available for many dangerous or deadly diseases. Over the years, these vaccines have prevented countless cases of disease and saved millions of lives. Infants, children, adolescents, teens and adults need different vaccinations, depending on their age, location, job, lifestyle, travel schedule, health conditions or previous vaccinations.

The vaccines are available for Chickenpox (Varicella), **Diphtheria**, Flu (Influenza**), Hepatitis A** , Hepatitis B, Hib (Haemophilus influenzae type b), HPV (Human Papillomavirus), **Measles**, **Meningococca**l, Mumps, Pneumococcal, **Polio** (Poliomyelitis), Rotavirus, Rubella (German Measles), Shingles (Herpes Zoster), **Tetanus** (Lockjaw), Whooping Cough (Pertussis)

Q.6) Consider the following statements:

1. Photons are the most widely occurring particle in universe.
2. Plasma is the fourth state of matter after solid, liquid and gas.
3. The fifth state of matter Bose – Einstein condensate is man-made.

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

Q.6) Solution (d)

Explanation:

Statement 1: Photon is a type of elementary particle. It is the quantum of the electromagnetic field including electromagnetic radiation such as light and radio waves, and the force carrier for the electromagnetic force. Photons are massless, so they always move at the speed of light in vacuum. **The light particles Photons are the most abundant particle in universe followed by Neutrionos.**

Statement 2: Matter is the "stuff" that makes up the universe — everything that takes up space and has mass is matter. All matter is made up of atoms, which are in turn made up of protons, neutrons and electrons. Atoms come together to form molecules, which are the building blocks for all types of matter.

- **There are four natural states of matter: Solids, liquids, gases and plasma.**
- Plasma is not a common state of matter here on Earth, but it may be the most common state of matter in the universe.
- Plasma consists of highly charged particles with extremely high kinetic energy.
- The noble gases (helium, neon, argon, krypton, xenon and radon) are often used to make glowing signs by using electricity to ionize them to the plasma state.

Statement 3: **the fifth state of matter is Bose –Einstein condensate which was created by scientists in 1995.** Using a combination of lasers and magnets. A BEC is used to study quantum mechanics on a macroscopic level. Light appears to slow down as it passes through a BEC, allowing scientists to study the particle/wave paradox. A BEC also has many of the properties of a superfluid, or a fluid that flows without friction. BECs are also used to simulate conditions that might exist in black holes.

So, all statements are correct.

Q.7) Consider the following statements regarding GEMINI:

1. It is a satellite based advisory service for Indian Farmers.
2. It receives and transfers data received from Gagan Satellite to a mobile through Bluetooth connection.

Which of the above statements is/are *incorrect*?

a) 1 only
b) 2 only
c) Both
d) None

Q.7) Solution (a)

Explanation:

Gagan Enabled Mariner's Instrument for Navigation and Information (GEMINI) is a satellite based advisory service for **Indian fisherman. (So, statement 1 is incorrect)**

- To receive the messages transmitted through the GAGAN satellites, INCOIS together with AAI developed a low-cost GAGAN system-enabled GEMINI (GAGAN Enabled Mariner's Instrument for Navigation and Information) device and electronically designed and manufactured by a private industry M/S Acord, Bangalore under Make in India Program.
- **The GEMINI device receives and transfers the data received from GAGAN satellite/s to a mobile through Bluetooth communication**. A mobile application developed by INCOIS decodes and displays the information in nine regional languages. (**So, statement 2 is correct here.)**
- It utilize the GAGAN (GPS Aided Geo Augmented Navigation) satellite system to transmit the PFZ, OSF and disaster warnings to fishermen with GAGAN system consisting of three geosynchronous satellites (GSAT-8, GSAT-10 and GSAT-15).
- GAGAN foot-print covers the entire Indian Ocean round the clock.
- This is in consonance with an effort to achieve Blue Revolution. The Meena Kumari Committee had recommended optimum utilization of the Exclusive Economic Zone (EEZ)— sea between 22 and 370 km from the coast.

Q.8) Consider the following statements regarding zoonotic diseases:

1. These are diseases which spread from Animals to humans.
2. More than half of human infection are estimated to have an animal origin.
3. Zoonotic diseases can be bacterial, parasitic or viral in nature.

Which of the statements given above are correct?

a) 1 and 2 only

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

Q.8) Solution (d)

Explanation:

Zoonosis or zoonotic disease is a disease that has passed into the human population from an animal source directly or through an intermediary species. Zoonotic infections **can be bacterial, viral, or parasitic in nature,** with animals playing a vital role in maintaining such infections. Examples of zoonosis include HIV-AIDS, Ebola, Lyme Disease, malaria, rabies, West Nile fever, and the current novel coronavirus disease (COVID-19) disease.

The report on Zoonotic diseases by and the International Livestock Research Institute (ILRI) and UNEP argues:

- **About 60 per cent of known infectious diseases in humans and 75 per cent of all emerging infectious diseases are zoonotic,**
- It identified seven anthropogenic driving factors leading to the emergence of zoonotic diseases — increased demand for animal protein; rise in intense and unsustainable farming; the increased use and exploitation of wildlife; unsustainable utilisation of natural resources; travel and transportation, changes in food supply chains and the climate change crisis.
- Moreover, loss of forest cover for agricultural purposes such as growing of soy, used as a key constituent of animal feed, is also influencing the emergence of zoonotic diseases by increasing human access to wildlife.
- The UNEP and ILRI emphasised on the importance of a 'One-Health' approach to manage and prevent zoonotic disease outbreaks and pandemics, occurring at the interface of human, animal and environment health.

So, all the three statements are correct.

Q.9) Consider the following pairs

	Space Mission	**:**	**Country**
1.	Hope Probe	:	Saudi Arabia
2.	Beresheet	:	Israel

3. Ravana 1 : Sri Lanka

Which of the above pairs is/are correct?

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

Q.9) Solution (b)

Statement Analysis:

Statement 1 **The United Arab Emirates' first mission to Mars entered the orbit of the red planet, seven months after the Emirati-built 'Hope Probe' was launched from Tanegashima in Japan.** With this, the UAE has become the fifth country after the US, Russia, China, the EU, and India, to reach the Martian orbit. Hope is the UAE's fourth space mission and first interplanetary one. The previous three were all Earth-observation satellites. **(So, statement 1 is incorrect)**

Statement 2: **Beresheet was Israel's first lunar mission and the first attempt by a private company to land on the Moon.** The mission achieved lunar orbit, but was lost during an April 2019 landing attempt. NASA had installed a small laser retroreflector aboard the lander to test its potential as a navigation tool.

Statement 3: **Raavana 1 is a Sri Lankan low orbit cube research satellite** and the second satellite of Sri Lanka after SupremeSAT-1 launched in 2012. The satellite was launched as part of Cygnus NG-11 by the United States on 17 April 2019.

Q.10) Consider the following statements regarding international finance facility for immunization:

1. It is an International Medico-Humanitarian NGO with a headquarter in Geneva.
2. It issues Vaccine bonds on capital market against Long term donor pledges.

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

Q.10) Solution (b)

Explanation:

The concept of an International Finance Facility (IFF) first was proposed by HM Treasury in conjunction with the Department for International Development of the United Kingdom.

- An IFF is designed to frontload aid to help meet the Millennium Development Goals.
- The first IFF is the "International Finance Facility for Immunisation" (IFFIm), begun by France, the UK and other European **countries in 2006 with headquarter in London.**
- IFFIm was initiated to rapidly accelerate the availability and predictability of funds for immunisation.
- **IFFIm sells bonds - officially called Vaccine Bonds - on the capital markets to raise funds for the GAVI Alliance,** a public-private partnership which works to save children's lives and protect people's health by increasing access to vaccination in developing countries. (**So, only statement 2 is correct here)**

Q.11) Which of the following statements are NOT correct with reference to intensified Mission Indradhanush?

1. It seeks to further intensify universal Immunization Programme.
2. It aims to reach each and every child up to five years of age and pregnant women left uncovered under immunization program.
3. IMI – 2.0 will target the districts which have immunisation coverage of 70% or below.

Select the appropriate option:

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

Q.11) Solution (b)

Basic Information:

Immunization Programme in India was introduced in 1978 as 'Expanded Programme of Immunization' (EPI) by the Ministry of Health and Family Welfare, Government of India. In 1985, the programme was modified as 'Universal Immunization Programme' (UIP) to be implemented

in phased manner to cover all districts in the country by 1989-90 with the one of largest health programme in the world. Despite being operational for many years, UIP has been able to fully immunize only 65% children in the first year of their life.

Statement Analysis:

Statement 1 and 2**: To further intensify the Universal immunization programme**, Prime Minister Shri Narendra Modi launched the Intensified Mission Indradhanush (IMI) on October 8, 2017. **Through this programme, Government of India aims to reach each and every child up to two years of age and all those pregnant women who have been left uncovered under the routine immunisation programme/UIP**. The focus of special drive was to improve immunisation coverage in select districts and cities to ensure full immunisation to more than 90% by December 2018. (**So, statement 1 is correct and Statement 2 is incorrect)**

Statement 3: IMI 2.0, the second phase of the initiative launched on October 31, 2019. Immunisation is set to be carried out in 271 districts **across the country where fewer than 70% infants are currently vaccinated.**

The scheme, which aims to achieve the target by March 2020, will especially focus on 652 blocks across 109 districts in Uttar Pradesh and Bihar – both among India's worst performers on immunisation coverage.

The salient features of IMI 2.0 are:

- Conduction of four rounds of immunization activity over 7 working days excluding the RI days, Sundays and holidays.
- Enhanced immunization session with flexible timing, mobile session and mobilization by other departments.
- Enhanced focus on left outs, dropouts, and resistant families and hard to reach areas.
- Focus on urban, underserved population and tribal areas.
- Inter-ministerial and inter-departmental coordination.
- Enhance political, administrative and financial commitment, through advocacy.
- IMI 2.0 drive is being conducted in the selected districts and urban cities between Dec 2019 – March 2020

A portal named Intensified Mission Indradhanush 2.0(https://imi2.nhp.gov.in/AboutUs) has been designed to manage the data reporting by different ministries/ departments, and to capture pre-campaign activities, activities during immunization rounds and post campaign indicators on immunization coverage**.**

Q.12) Consider the following statements with reference to Nag Missile:

1. It is India's third generation anti- tank guided missile
2. Development of the Nag is part of the Integrated Guided Missile Development Program (IGMDP)

Select the correct answer using the code below:

a) 1 only
b) 2 only
c) Both 1 and 2
d) None of the above

Q.12) Solution (c)

Explanation:

Nag Missile:

- **It is an Indian third-generation, all-weather, fire-and-forget, lock-on after launch, anti-tank guided missile (ATGM) with an operational range of 500 m to 20 km.**
- **Development of the Nag is part of the Integrated Guided Missile Development Program (IGMDP), run by Defence Research and Development Organisation (DRDO**).
- ATGM NAG has been developed by DRDO to engage highly fortified enemy tanks in day and night conditions.
- The NAG missile carrier NAMICA is a BMP II based system with amphibious capability. With this final user trial, NAG will enter into production phase.
- The missile will be produced by Defence PSU Bharat Dynamics Limited (BDL), whereas Ordnance Factory Medak will produce the NAMICA.

So, both statements are correct.

Q.13) **With reference to National defence fund, consider the following statements**

1. It was established after Kargil war for the welfare of armed force personal and their dependents.
2. It is administered by an executive committee with PM as a chairman.

3. It is entirely dependent on voluntary contribution from public.

Which of the statements given above are correct?

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

Q.13) Solution (b)

Explanation:

National Defence Fund:

- **The fund was setup in the year 1962 to take charge of voluntary donations in cash and kind received for promotion of the national defence effort, and to decide on their utilisation.** The Fund is used for the welfare of the members of the Armed Forces (including Para Military Forces) and their dependents. (**So, statement 1 is incorrect.)**
- The **Fund is administered by an Executive Committee, with PM as Chairperson**, and Defence, Finance and Home Ministers as Members. Finance Minister is the Treasurer of the Fund and the Joint Secretary, PMO dealing with the subject is Secretary of the Executive Committee. Accounts of the Fund are kept with the Reserve Bank of India.
- **The fund is entirely dependent on voluntary contributions from the public and does not get any budgetary support**.
- Schemes under the National Defence Fund
    - A scholarship scheme to encourage technical and post-graduation education for the widows and wards of the deceased personnel of Armed Forces, Para Military Forces, all State Police and Railway Protection Force is being implemented.
    - The scheme is being implemented by the Department of Ex-Servicemen Welfare, Ministry of Defence in respect of armed forces.
    - Ministry of Home Affairs is the implementing agency for the personnel of Para Military Forces and State Police Force.
    - Ministry of Railways is the implementing agency for the personnel of Railway Protection force.

Q.14) **At present which of the following country is known to possess Inter-continental Ballistic**

Missile?

1. Israel
2. India
3. UK
4. North Korea
5. China

Select the correct code from above

a) 1, 2 and 3 only
b) 2, 3, 4 and 5 only
c) 1, 2, 3 and 5
d) All of the above

Q.14) Solution (d)

Explanation:

Ballistic missiles are powered by rockets initially but then they follow an unpowered, free-falling trajectory toward their targets. They are classified by the maximum distance that they can travel, which is a function of how powerful the missile's engines (rockets) are and the weight of the missile's payload. To add more distance to a missile's range, rockets are stacked on top of each other in a configuration referred to as staging. There are four general classifications of ballistic missiles:

- Short-range ballistic missiles, traveling less than 1,000 kilometers (approximately 620 miles);
- Medium-range ballistic missiles, traveling between 1,000–3,000 kilometers (approximately 620-1,860 miles);
- Intermediate-range ballistic missiles, traveling between 3,000–5,500 kilometers (approximately 1,860-3,410 miles); and
- Intercontinental ballistic missiles (ICBMs), traveling more than 5,500 kilometers.
- **USA, Russia, India (Agni V), China, France, UK, Israel and North Korea (in 2017) is known to have possessing ICBMs.**

Q.15) The term 'juice jacking' has been in news, what is it?

a) type of cyber attack

b) a diseases in fruits
c) experiment relating to quantum communication
d) none of the above

Q.15) Solution (a)

Explanation:

Juice jacking is a type of cyber-attack involving a charging port that doubles as a data connection, typically over USB. This often involves either installing malware or surreptitiously copying sensitive data from a smart phone, tablet, or other computer device.

- It is a hardware-focused Man in the Middle (MitM) attack. The attacker uses a USB connection to load malware directly onto the charging station or infect a connection cable and leave it plugged in, hoping some unsuspecting person will come along and use the 'forgotten' cable.
- USB ports and phone charging cables are the most common devices used in juice-jacking attacks. Other less common devices that may be used in this type of exploit include USB ports in video arcade consoles and portable battery power banks.

Q.16) The term Sycamore is associated with which of the following

a) Asteroid
b) Laser beaming innovation
c) Quantum computer
d) Nano-material

Q.16) Solution (c)

Explanation:

Sycamore is a quantum processor created by Google Inc.'s Artificial Intelligence division. It comprises 53 qubits.

- **In 2019, Sycamore completed a task in 200 seconds that Google claimed, in a Nature paper, would take a state-of-the-art supercomputer 10,000 years to finish. Thus, Google claimed to have achieved quantum supremacy.**
- Our traditional computers work on the basis of the laws of classical physics, specifically by utilising the flow of electricity.

- A quantum computer, on the other hand, seeks to exploit the laws that govern the behaviour of atoms and subatomic particles. At that tiny scale, many laws of classical physics cease to apply, and the unique laws of quantum physics come into play.
- In classical computer, Bits of information are stored as either 0 or 1. Every string of such digits (bitstrings) represents a unique character or instruction; for example, 01100001 represents the lowercase "a".
- In a quantum computer, information is stored in quantum bits, or qubits. And a qubit can be both 0 and 1 at the same time. Quantum physics involves concepts that even physicists describe as weird. Unlike classical physics, in which an object can exist in one place at one time, quantum physics looks at the probabilities of an object being at different points. Existence in multiple states is called superposition, and the relationships among these states is called entanglement.
- The higher the number of qubits, the higher the amount of information stored in them. Compared to the information stored in the same number of bits, the information in qubits rises exponentially. That is what makes a quantum computer so powerful.

Q.17) Consider the following statements about deep learning:

1. Deep learning is a machine learning technique that teaches computers to do what comes naturally to humans.
2. Deep learning is a key technology behind driverless cars, enabling them to recognize a stop sign.

Which of the statements given above is/are *incorrect*?

a) 1 only
b) 2 only
c) Both
d) None

Q.17) Solution (c)

Deep learning is a **machine learning technique** that teaches computers to do what comes naturally to humans: learn by example**. Deep learning is a key technology behind driverless cars, enabling them to recognize a stop sign**, or to distinguish a pedestrian from a lamppost.

- It is the key to voice control in consumer devices like phones, tablets, TVs, and hands-free speakers. Deep learning is getting lots of attention lately and for good reason. It's achieving results that were not possible before.
- In deep learning, a computer model learns to perform classification tasks directly from images, text, or sound.
- Deep learning models can achieve state-of-the-art accuracy, sometimes exceeding human-level performance.
- Models are trained by using a large set of labeled data and neural network architectures that contain many layers.

So, both statements are correct here.

Q.18) Which of the following diseases is NOT caused by Virus?

a) Dengue
b) Tuberculosis
c) Rabies
d) Aids

Q.18) Solution (b)

Explanation:

Dengue: Dengue is a **mosquito-borne viral infection**. T**he virus responsible for causing dengue, is called dengue virus (DENV)**. There are four DENV serotypes, meaning that it is possible to be infected four times.

- Severe dengue is a leading cause of serious illness and death in some Asian and Latin American countries. It requires management by medical professionals.
- There is no specific treatment for dengue/severe dengue.
- Early detection of disease progression associated with severe dengue, and access to proper medical care lowers fatality rates of severe dengue to below 1%.Dengue is found in tropical and sub-tropical climates worldwide, mostly in urban and semi-urban areas.

Tuberculosis: Tuberculosis (TB) is caused by bacteria (Mycobacterium tuberculosis) that most often affect the lungs. Tuberculosis is curable and preventable. TB is spread from person to person through the air. When people with lung TB cough, sneeze or spit, they propel the TB germs into the air. A person needs to inhale only a few of these germs to become infected.

About one-quarter of the world's population has a TB infection, which means people have been infected by TB bacteria but are not (yet) ill with the disease and cannot transmit it.

Rabies: Rabies is a vaccine-preventable, zoonotic, viral disease. Once clinical symptoms appear, rabies is virtually 100% fatal. In up to 99% of cases, domestic dogs are responsible for rabies virus transmission to humans. Yet, rabies can affect both domestic and wild animals. It is spread to people and animals through bites or scratches, usually via saliva.

Aids: The human immunodeficiency virus (HIV) targets the immune system and weakens people's defense against many infections and some types of cancer. As the virus destroys and impairs the function of immune cells, infected individuals gradually become immunodeficient. Immune function is typically measured by CD4 cell count.

- Immunodeficiency results in increased susceptibility to a wide range of infections, cancers and other diseases that people with healthy immune systems can fight off.
- The most advanced stage of HIV infection is acquired immunodeficiency syndrome (AIDS), which can take many years to develop if not treated, depending on the individual.
- AIDS is defined by the development of certain cancers, infections or other severe long term clinical manifestations.

Q.19) In the context of Non-Nuclear aggression agreement, consider the following statements:

1. It is agreement between India and china.
2. It prohibits attack on nuclear installation and facilities.

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

Q.19) Solution (b)

Explanation:

The **Non-nuclear aggression agreement is a bilateral and nuclear weapons control treaty between the two South Asian states, India and Pakistan**, on the reduction (or limitation) of

nuclear arms and pledged not to attack or assist foreign powers to attack on each's nuclear installations and facilities. **(So, statement 1 is incorrect.)**

- The treaty was drafted in 1988, and signed by the Prime Minister Benazir Bhutto and her Indian counterpart, Rajiv Gandhi on 21 December 1988; it entered into force on January 1991.
- **The treaty barred its signatories to carry out a surprise attack (or to assist foreign power to attack) on each other's nuclear installations and facilities. (So, statement 2 is correct)**
- Starting in January 1992, India and Pakistan have annually exchanged lists of their respective military and civilian nuclear-related facilities.

Q.20) Which of the following are correct with reference to Regional Raw drug repository (RRDR):

1. It has been launched by Ministry of Chemical and fertilizers.
2. Raw Drug Repositories are facilities that house natural resources used in the Indian System of Medicine, in the form of herbarium and raw drug samples.
3. RRDR would be involved in the collection, documentation and authentication of raw drugs gathered largely from the respective agro-climatic region.

Which of the above statements are correct?

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

Q.20) Solution (c)

Statement analysis:

Raw Drug Repositories are facilities that house natural resources used in the Indian System of Medicine, in the form of herbarium and raw drug samples. It also helps authenticate the identity of medicinal plants. (So, Statement 2 is correct.)

- RRDRs are important components of the Centrally Sponsored Scheme of National AYUSH Mission, which plays an important role in medicinal plants cultivation.

- As a step in this direction**, Ministry of AYUSH,** through the National Medicinal Plants Board, initiated establishment of National Raw Drug Repository and Regional Raw Drug Repositories. (**So, statement 1 is incorrect because RRDR is under Ministry of Aayush)**
- **This RRDR would play a stellar role in collection, documentation, and authentication of raw drugs collected from the agro-climatic region**, that is, the Southern Plateau Region. (**So, statement is correct here)**
- There is a global resurgence in the traditional and alternative health care system.
- We in India are fortunate to have systems of medicine which date back to more than 3000 years and have deep rooted societal acceptance. Ayurveda, Siddha, Unani and systems of medicine are accessible to large segment of our population including those living in remote and interior areas.
- Medicinal Plants form the major resource base of our indigenous health care traditions. Their relevance has grown substantially in the current pandemic scenario, thanks to their disease preventive effects.
- The outreach and acceptability of AYUSH systems, both nationally as well as globally, are dependent on uninterrupted availability of quality medicinal plants based raw material. Though most of our raw drugs are commonly available, there is a lack of scientific documentation which makes research on these medicines very difficult. This also reduces the chances of commercial exploitation of these medicines.
- Easy availability of authentic scientific date of the raw drugs will promote the research on the medicines belonging to AYUSH system which will lead to further propagation of these systems.
- The growth and acceptability of traditional systems require robust infrastructure of hospitals, dispensaries, pharmacies and manufacturing units so as to manufacture and dispense quality medicine.
- The country has more than 9000 manufacturing units for Ayurveda, Siddha, Unani and Homeopathy medicine. However, the quality of medicines produced by these units critically depend upon the manufacturing process followed as well as the quality of raw material.
- The Government has made it mandatory for all manufacturing units to adhere to the Good Manufacturing Practices as notified under Schedule T of the Drugs and Cosmetics Act 1940. However, since more than 90% of the formulations under these systems of medicine are plant based, what is critical is to ensure sustained availability of quality raw material.

Q.21) Consider the following statements with reference to "Government e-Marketplace (GeM) Portal":

1. It functions under the Directorate General of Supplies and Disposals (DGS&D), the Ministry of Commerce & Industry.
2. It facilitates online procurement of common use Goods & Services required by various Government Departments/Organisations / PSUS etc.
3. The purchases through GeM by Government users have been authorized and made mandatory by Ministry of Finance. .

Which of the above given statements is/are incorrect?

a) 1 and 2 only
b) 2 and 3 only
c) 1 and 3 only
d) None of the above

Q.21) Solution (d)

Explanation:

Note:- Incorrect statements are being asked here.

About Government e-Marketplace (GeM):

- **It is National Procurement Portal functions under the Directorate General of Supplies and Disposals (DGS&D), the Ministry of Commerce & Industry.**
- It provides the tools of e-bidding, reverse e-auction and demand aggregation to facilitate the government users, achieve the best value of their money.
- It is paperless, cashless and contactless platform giving end to end solution.
- It **facilitates online procurement of common use Goods & Services** required by various Government Departments/Organisations / PSUS.
- **The purchases through GeM by Government users have been authorized and made mandatory by Ministry of Finance** by adding a new Rule No. 149 in the General Financial Rules, 2017.
- To improve the portal further, GeM 2.0 was launched as a pilot project and GeM 3.0 offers powerful search engine, real time and multisource price comparison, demand aggregation, etc. GeM 4.0 is the latest version.

Hence all of the statements are correct.

Q.22) Consider the following about the Convention on the Conservation of Migratory Species of Wild Animals

1. India is party to the convention.
2. It is a successor of the global convention specializing in the conservation of migratory species that was established first during 1992 Earth Summit.
3. It is the only global convention specialising in the conservation of migratory species, their habitats and migration routes.

Which of the above given statement is/are correct?

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

Q.22) Solution (d)

Explanation:

Convention on the Conservation of Migratory Species of Wild Animals

- The Convention was signed in 1979 in Bad Godesberg, a suburb of Bonn (hence also the name Bonn Convention), and entered into force in 1983.
- CMS and its daughter agreements determine policy and provide further guidance on specific issues through their Strategic Plans, Action Plans, resolutions, decisions and guidelines.
- CMS acts as a framework Convention. The Agreements may range from legally binding treaties (called Agreements) to less formal instruments, such as Memoranda of Understanding.
- **India has been a party to the CMS since 1983**.
- India has signed a non-legally binding Memorandum of Understanding (MoU) with CMS on conservation and management of Siberian Cranes (1998), Marine Turtles (2007), Dugongs (2008), and Raptors (2016).
- **It is the only global convention specialising in the conservation of migratory species, their habitats and migration routes.**

- Several Agreements have been concluded to date under the auspices of CMS such as 'Raptor MoU' for conservation in Africa and Eurasia.

Q.23) Consider the following statement with reference to "E-way bill" often seen in news:

1. E-way bill is a document that needs to be generated before transporting or shipping goods worth more than Rs 50,000 within state or inter-state.
2. No transaction and goods are exempted from E-way bill generation.

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

Q.23) Solution (a)

Explanation:

About E-way Bill

- E-way bill or Electronic-way blis a document introduced under the GST regime that needs to be generated **before transporting or shipping goods worth more than Rs 50,000 within state or inter-state.**
- It is usually a unique bill number generated for the specific consignment involving the movement of goods.
- **There are some goods and transactions which do not require E-Way Bill and are exempt from the generation of E-Way Bill**. Which include-
    - Natural/cultural stones or pearls/precious stones.
    - Kerosene Oil under PDS.
    - Liquid petrol gas for the supply of household and non-domestic use.
    - Jewelry
    - Curd, Lassi, Any Milk product.
    - Fresh or Pasteurized milk
    - Fruits
    - Vegetables
    - Animals (Living), Plant, and trees etc.

Q.24) Consider the following statements about 'India's stand on refugees':

1. India is the first nation in South Asia to have a clear refugee policy.
2. India has not signed the 1951 United Nations Refugee Convention on the Status of Refugees.
3. Citizenship Amendment Act, 2019 aims to grant citizenship to illegal immigrants from selected countries.

Which of the statements given above is/are true?

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

Q.24) Solution (b)

Explanation:

India's stand on refugees

- **India has no clear refugee policy as decisions are made on a case to case basis. (Hence, statement 1 is incorrect.)**
- India has **not signed the 1951** United Nations Refugee Convention on the Status of Refugees, or its 1967 Protocol that stipulates the rights and services host states must provide refugees.
- India is party to Universal Declaration of Human Rights of 1948 and the International Covenant on Civil and Political Rights of 1966.
- However, India has offered shelter to Tibetans, Chakmas of Bangladesh, Afghans and ethnic Tamil refugees from Sri Lanka.
- **Citizenship Amendment Act, 2019** aims to grant citizenship to illegal immigrants from selected countries.

Q.25) Consider the following statements about "National financial reporting authority".

1. It is a regulatory body under Ministry of Commerce and Industry.

2. It was setup to oversee compliance with Accounting and Auditing Standards by companies that can be described as Public Interest Entities (PIES).
3. It was set up under the Companies act of 2013.

Which of the following statements is/are correct?

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

Q.25) Solution (b)

Explanation:

National financial reporting Authority

- Recently, NFRA has prepared a provisional database of companies and auditors that come under its regulatory ambit.
- **It is a regulatory body constituted by the Ministry of Corporate Affairs in 2018.** Hence, statement 1 is **Incorrect.**
- The Companies Act requires the NFRA to have a chairperson who will be appointed by the Central Government and a maximum of 15 members.
- The NFRA shall have the following powers:
    - To investigate the matters of professional or other misconduct committed by a prescribed class of CA firms or CAs.
    - No other authority can initiate or continue proceedings where the NFRA has initiated an investigation. Such an investigation can be initiated either suo moto (by itself) or on a reference made by the Central Government.
- **It was set up under Companies Act 2013 to oversee compliance with Accounting and Auditing Standards by companies that can be described as Public Interest Entities (PIES).**
    - This group includes all listed companies, and large unlisted companies.

Q.26) Consider the following statements about "Lord Basavanna":

1. He spread social awareness through his poetry, popularly known as Vachanaas.
2. He rejected gender or social discrimination, superstitions and rituals.

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

Q.26) Solution (c)

Explanation:

Basavanna (Mahatma Basveshwara)

- He was an Indian 12th century statesman, philosopher, poet, social reformer and a Lingayat saint in the Shiva-focussed Bhakti movement, and Hindu Shaivite social reformer during the reign of the Kalyani Chalukya and Kalachuri dynasty.
- **He spread social awareness through his poetry, popularly known as Vachanaas**
- He introduced new public institutions such as the 'Anubhava Mantapa' (or, the "hall of spiritual experience") which welcomed men and women from all socio-economic backgrounds to discuss spiritual and mundane questions of life, in open.
- **He rejected gender or social discrimination, superstitions and rituals.**
- He advocated that every human being was equal, irrespective of caste and that all forms of manual labor was equally important.

Q.27) Which of the following species of Elephant have been categorised as Critically endangered by IUCN?

1. African Forest Elephant
2. African Savanna Elephant
3. Asian Elephant

Select the correct option:

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

Q.27) Solution (b)

Explanation:

African Elephants

- **IUCN has categorised, African savanna elephants as "endangered" and much smaller, lighter African forest elephants as "critically endangered".** These two are subspecies of African elephants. Both species are facing threat from poaching for ivory and human encroachment.
    - **Forest elephants** are an elusive subspecies of African elephants and inhabit the densely wooded rainforests of west and central Africa. Their preference for dense forest habitat prohibits traditional counting methods such as visual identification. Their population is usually estimated through "dung counts"—an analysis on the ground of the density and distribution of the feces. Forest elephants are smaller than savanna elephants, the other African elephant subspecies
    - **Savanna elephants** are the largest subspecies of elephant. They are easily distinguished by their very large ears—which allow them to radiate excess heat—and front legs which are noticeably longer than the hind legs. They are found throughout the grassy plains and bushlands of Africa.

Statement 3: **Asian elephants** (found in India) are smaller than African elephants, and their ears smaller compared to the large fan-shaped ears of the African species.

- Only some male Asian elephants have tusks, while both male and female African elephants grow tusks.
- Asian Elephants have 3 subspecies: Indian, Sri Lankan and Sumatran.
- **They are endangered** not critically endangered under IUCN list of Threatened species.

Q.28) Recently Iron dome of Israel was in news, it is a -

a) A cyber weapon developed by Israel to target critical infrastructure of enemy nation
b) A mobile all-weather air defense system capable of intercepting rockets, artillery, mortars and Precision Guided Munitions.
c) A sacred religious site revered by both Israeli Jews and Palestinian Muslims.
d) A dome shaped shelter built by Israel to protect its people from nuclear attacks.

Q.28) Solution (b)

Explanation:

Iron Dome is a multi-mission system capable of intercepting rockets, artillery, mortars and Precision Guided Munitions like very short range air defence (V-SHORAD) systems as well as aircraft, helicopters and Unmanned Aerial Vehicles (UAV) over short ranges of up to 70 km.

- It is an all-weather system and can engage multiple targets simultaneously and be deployed over land and sea.
- Iron Dome is manufactured by Rafael Advanced Defence Systems Limited and has been in service with Israeli Air Force since 2011.
- The radar system was developed by Elta.
- Its development was prompted after a series of rocket attacks on Israel by Hezbollah and Hamas in the 2000s.
- In the 2006 Lebanon war, around 4,000 rockets were fired on the northern parts of Israel resulting in the death of about 44 Israeli civilians and evacuation of around 250,000 citizens following the development of the system was taken up.

Q.29) Recently, BlockTrack technology was in news, it is a -

a) Technology used for tracking financial transactions
b) Blockchain technology used for sale of Facebook cryptocurrency.
c) Technology that can block transfer of data by third party
d) Blockchain based data exchange system

Q.29) Solution (d)

Explanation:

BlockTrack technology

- Researchers at the Indian Institute of Technology-Madras have developed "blocktrack", a **blockchain-based secure medical data and information exchange system** for mobile phone applications.
- The system is field tested at the Institute's hospital.
- The project originated during the height of COVID-19 in 2020 has CSR support from Infosys.

- Blocktrack aims to securely digitising healthcare information systems while protecting sensitive personal information and medical records by decentralising control and ownership of patient data through a blockchain-based innovation.
- The innovation is protected through a provisional IP filed with the Indian Patent Office.

Q.30) Consider the following statement regarding 'Rashtriya Vayoshree Yojana:

1. It aims at providing Senior Citizens, belonging to BPL category and suffering from any of the age related disability/infirmity.
2. It is a central sector scheme launched by Ministry of Social Justice and empowerment.
3. The expenditure for implementation of the scheme will be met from the "Senior Citizens' Welfare Fund".

Which of the above statement is/are correct?

a) 1 and 2 only
b) 1 only
c) 2 and 3 only
d) All of the Above

Q.30) Solution (d)

Explanation

Rashtriya Vayoshri Yojana (RVY)

- Rashtriya Vayoshri Yojana (RVY) is a scheme for providing Physical Aids and Assisted-living Devices for Senior citizens belonging to BPL category.
- This is a Central Sector Scheme, fully funded by the Central Government. The expenditure for implementation of the scheme will be met from the "Senior Citizens' Welfare Fund".
- The Scheme will be implemented through the sole implementing agency - Artificial Limbs Manufacturing Corporation (ALIMCO), a PSU under the Ministry of Social Justice and Empowerment.
- Under the scheme, the physical aids will be provided only to the senior citizens of the nation. This implies those who are aged above 60 years will get free assisted living aids and physical devices which are required for their sustainability. Also the govt. has selected the list of cities where the scheme will be implemented.

- The main criteria for the senior citizens to get full benefits of Rashtriya Vayoshri Yojana (RVY) scheme is that they must belong to BPL family and should hold valid BPL card issued by the concerned authority.

Q.31) 5 persons A, B, C, D and E and their respective wives recently dined together and were seated at a circular table. The seats were so arranged that men and women alternated and each woman sat at a distance of three places from their husband. Mrs C sat to the left of Mr A. Mrs E sat two places to the right of Mrs B. Who sat to the right of Mr A?

a) Mrs D
b) Mrs E
c) Mrs B
d) Mrs B or D

Q.31) Solution (d)

Mrs A can't be sitting next to her husband as per the seating arrangement. Wives sit three places away from their husbands.

Mrs C is sitting to the left of Mr A. So, she can't be sitting to his right.

Mrs E is sitting two places to the right of Mrs B (and not Mrs C). So, she can't be sitting right next to Mr A.

Mrs B and Mrs D are the remaining two wives and each is equally likely to be sitting to the right of Mr A

Hence, option d is the correct answer.

Q.32) There are five houses P, Q, R, S and T. P is right of Q and T is left of R and right of P. Q is right of S. Which house is in the middle?

a) P
b) Q
c) T
d) R

Q.32) Solution (a)

From the information given in the question

We have, SQPTR

Hence, the person in the middle is P

Read the following three passages and answer the items that follow. Your answers to these items should be based on the passages only.

Passage 1

Brown et al. (2001) suggest that 'metabolic theory may provide a conceptual foundation for much of ecology just as genetic theory provides a foundation for much of evolutionary biology'. One of the successes of genetic theory is the diversity of theoretical approaches and models that have been developed and applied. A Web of Science (v. 5.9. Thomson Reuters) search on genetic* + theor* + evol* identifies more than 12000 publications between 2005 and 2012. Considering only the 10 most-cited papers within this 12000 publication set, genetic theory can be seen to focus on genome dynamics, phylogenetic inference, game theory and the regulation of gene expression. There is no one fundamental genetic equation, but rather a wide array of genetic models, ranging from simple to complex, with differing inputs and outputs, and divergent areas of application, loosely connected to each other through the shared conceptual foundation of heritable variation.

Q.33) Which of the following best captures the essence of the passage?

a) Genetic theory has a wide range of theoretical approaches and applications and metabolic theory must have the same in the field of ecology.
b) Genetic theory has a wide range of theoretical approaches and application and is foundational to evolutionary biology and metabolic theory has the potential to do the same for ecology.
c) Genetic theory provides an example of how a range of theoretical approaches and applications can make a theory successful.
d) Genetic theory has evolved to spawn a wide range of theoretical models and applications but metabolic theory need not evolve in a similar manner in the field of ecology.

Q.33) Solution (b)

The paragraph starts with the idea that metabolic theory may provide a conceptual foundation for ecology just as genetic theory did for evolutionary biology. It goes on to explain how the genetic theory worked: through wide array of genetic models loosely connected to each other through the shared conceptual foundation. Option b captures both ideas.

Option a states that metabolic theory "must have" the same range of theoretical approaches and applications. This is not what the paragraph says.

Option c does not mention metabolic theory while option d is incorrect, based on the information in the paragraph.

Passage 2

Aesthetic political representation urges us to realize that 'the representative has autonomy with regard to the people represented' but autonomy then is not an excuse to abandon one's responsibility. Aesthetic autonomy requires cultivation of 'disinterestedness' on the part of actors which is not indifference. To have disinterestedness, that is, to have comportment towards the beautiful that is devoid of all ulterior references to use – requires a kind of aesthetic commitment; it is the liberation of ourselves for the release of what has proper worth only in itself.

Q.34) Which among the following is the most logical inference that can be drawn from the passage?

a) Disinterestedness is different from indifference as the former means a non-subjective evaluation of things which is what constitutes aesthetic political representation.
b) Aesthetic political representation advocates autonomy for the representatives drawing from disinterestedness, which itself is different from indifference.
c) Disinterestedness, as distinct from indifference, is the basis of political representation.
d) Aesthetic political representation advocates autonomy for the representatives manifested through disinterestedness which itself is different from indifference.

Q.34) Solution (b)

The main idea of the paragraph is that aesthetic political representation requires that the actor has autonomy with regard to the portrayal and that this involves the cultivation of disinterestedness (which is different from indifference) on part of the actors. Option b captures the essence of the paragraph.

Option a talks of a "non-subjective evaluation of things", something that is not mentioned in the paragraph.

Option c does not include the key word 'aesthetic'.

Option d states that autonomy is "manifested through" (shown clearly by) disinterestedness. The paragraph only urges the cultivation of disinterestedness in order to liberate oneself from

all ulterior references.

Passage 3

The dominant hypotheses in modern science believe that language evolved to allow humans to exchange factual information about the physical world. But an alternative view is that language evolved, in modern humans at least, to facilitate social bonding. It increased our ancestors' chances of survival by enabling them to hunt more successfully or to cooperate more extensively. Language meant that things could be explained and that plans and past experiences could be shared efficiently.

Q.35) Which of the following best captures the essence of the passage?

a) From the belief that humans invented language to process factual information, scholars now thinks that language was the outcome of the need to ensure social cohesion and thus human survival.
b) Since its origin, language has been continuously evolving to higher forms, from being used to identify objects to ensuring human survival by enabling our ancestors to bond and cooperate.
c) Experts are challenging the narrow view of the origin of language, as being merely used to describe facts and label objects, to being necessary to promote more complex interactions among humans.
d) Most believe that language originated from a need to articulate facts, but others think it emerged from the need to promote social cohesion and cooperation, thus enabling human survival.

Q.35) Solution (d)

The main idea of the paragraph is that challenging the dominant hypothesis that language evolved in order to facilitate exchange of factual information; an alternative view holds that language evolved in order to facilitate social bonding and improve chances of survival. Option d captures all key ideas.

Option a incorrectly uses the word "invented".

Option b talks about language "continuously evolving to higher forms". The paragraph does not state this.

Option c states "experts" are challenging the "narrow" view of origin of language. The paragraph only talks about "an alternative view".

Hence, option d is correct.