

WBCS (Main) Exam. Paper – IV Practice Set

Answers with Explanation

1. (d) A polarized 3D system uses polarization glasses to create the illusion of three-dimensional images by restricting the light that reaches each eye, an example of stereoscopy. To present stereoscopic images and films, two images are projected superimposed onto the same screen or display through different polarizing filters. The viewer wears low-cost eyeglasses which contain a pair of different polarizing filters. As each filter passes only that light which is similarly polarized and blocks the light polarized in the opposite direction, each eye sees a different image. শ্রীচিডম
2. (b) The visible spectrum is the portion of the electromagnetic spectrum that is visible to (can be detected by) the human eye. Electromagnetic radiation in this range of wavelengths is called visible light or simply light. A typical human eye will respond to wavelengths from about 390 to 750 nm in terms of angstrom it is in between 3900 - 7600 Å°.
3. (a) Projectile motion is a form of motion in which an object or particle is thrown near the earth's surface and it moves along a curved path under the action of gravity only.
4. (b) Nylon, the first synthetic fiber in the "fully synthetic" sense of that term, was developed by Wallace Carothers, an American researcher at the chemical firm DuPont in the 1930s.
5. (b) In physics and materials science, the Curie temperature (T_C, or Curie point, is the temperature at which a ferromagnetic or a ferromagnetic material becomes paramagnetic on heating; the effect is reversible. A magnet will lose its magnetism if heated above the Curie temperature. The term is also used in piezoelectric materials to refer to the temperature at which spontaneous polarization is lost on heating. শ্রীচিডম
6. (c) The volume of materials changes depending on current temperature. Usually heat makes them expand, and cold leads them to contract. To a first approximation, the change in length measurements of an object ("linear dimension" as opposed to, e.g., volumetric dimension) due to thermal expansion is related to temperature change by a "linear expansion coefficient". It is the fractional change in length per degree of temperature change. শ্রীচিডম
7. (b) The extraction of cream happens because of the work of centrifugal force which works outward. The separation of cream from milk is based on the fact that when liquids of different specific gravities revolve around the same centre at the same distance with the same angular velocity, a greater centrifugal force is exerted on the heavier liquid than on the lighter one. Milk can be regarded as two liquids of different specific gravities, the serum and the fat.
8. (b) Therm is a non-SI unit of heat energy equal to 100,000 British thermal units (BTU). It is approximately the energy equivalent of burning 100 cubic feet (often referred to as 1 CCF) of natural gas. Since (Natural Gas) meters measure volume and not energy content, a therm factor is used by (Natural) gas companies to convert the volume of gas used to its heat equivalent, and thus calculate the actual energy use. শ্রীচিডম
9. (c) Diffusion is one of several transport phenomena that occur in nature. A distinguishing feature of diffusion is that it results in mixing or mass transport without requiring bulk motion. Thus, diffusion should not be confused with convection or advection, which are other transport mechanisms that use bulk motion to move particles from One place to another.
10. (d) The level of current passing through the human body is directly related to the resistance of its path. through the body. Under dry conditions, the resistance offered by the human body may be as high as 100,000 Ohms.
11. (d) A flame test is performed by introducing a sample into the blue flame of a bunsen burner and noting any change in the colour of the flame. The tests can be used to detect the presence of some metallic elements in salts. With strontium salt, the colour of Bunsen flame ranges from crimson to red. শ্রীচিডম

12. (c) Esters are common in organic chemistry and biological materials, and often have a characteristic pleasant, fruity odour. This leads to their extensive use in the fragrance and flavor industry. Ester bonds are also found in many polymers. Esterification is the general name for a chemical reaction in which two reactants (typically an alcohol and an acid) form an ester as the reaction product. Esters are widespread in nature and are widely used in industry.
13. (d) Eosin is a dye used to prepare red ink. Eosin Y is a xanthene dye and is used for the differential staining of connective tissue and cytoplasm. শ্রীচিড়ান্ন
14. (b) Early submarines used a direct mechanical connection between the engine and propeller, switching between diesel engines for surface running, and electric motors for submerged propulsion. Diesel electric submarines have a stealth advantage over their nuclear counterparts.
15. (d) Fiber glass is a fiber reinforced polymer made of a plastic matrix reinforced by fine fibers of glass. It is also known as GFK. Fiberglass is a lightweight, extremely strong, and robust material. Although strength properties are somewhat lower than carbon fiber and it is less stiff, the material is typically far less brittle, and the raw materials are much less expensive. Its bulk strength and weight properties are also very favorable when compared to metals, and it can be easily formed using molding processes.
16. (a) Magnesium sulfate is an inorganic salt (chemical compound) containing magnesium, sulfur and oxygen which is commonly called Epsom Salt. Because like other salts, it withdraws water from cells, Epsom salt is used as a fast-acting purgative in some types of poisoning, to draw water into the intestines, thus, reducing constipation; to withdraw toxins from the body; and to draw fluid from the brain in cases of cerebral edema. শ্রীচিড়ান্ন
17. (c) Concentrated Sulfuric acid can only be stored in glass, no metal lids, some plastic containers. It will attack anything organic, causing severe burns, the good thing is it will not start a fire but if it goes into contact with a metal it may generate hydrogen gas, an explosion risk.
18. (d) Kidney stones form when your urine contains more crystal-forming substances—such as calcium, oxalate and uric acid – than the fluid in your urine can dilute. শ্রীচিড়ান্ন
19. (b) The process of electroplating takes place as metals in ionic form move from a positive to negative electrode. An electric current passing through the solution causes objects at the cathode or work piece to be coated by the metal in the solution. Electroplating is done for many reasons, usually to beautify, insulate or to protect and to increase the corrosion resistance, conductivity solder ability of metal objects. Plating protects by one of two ways, either sacrificially or mechanically.
20. (c) Argon is produced industrially by the fractional distillation of liquid air. Argon is mostly used as an inert shielding gas in welding and other high-temperature industrial processes where ordinarily non-reactive substances become reactive; for example, an argon atmosphere is used in graphite electric furnaces to prevent the graphite from burning. Argon has also has uses in incandescent and fluorescent lighting, and other types of gas discharge tubes. Argon makes a distinctive blue-green gas laser.
21. (b) Mammalian erythrocytes are unique among the vertebrates as they are nonnucleated cells in their mature form. These cells have nuclei during early phases of erythropoiesis, but extrude them during development as they mature in order to provide more space for hemoglobin. In mammals, erythrocytes also lose all other cellular organelles such as their mitochondria, Golgi apparatus and endoplasmic reticulum. শ্রীচিড়ান্ন
22. (a) Gold, which is not only the most valuable of metals, but also is without its peer in freedom from alloy, is known as the king of metals. Luxurious, classy and beautiful, gold is the most classic and coveted jewelry metal of all. It is also the oldest precious metal known to man.
23. (d) The Chernobyl disaster was a catastrophic nuclear accident that occurred on 26 April 1986 at the Chernobyl Nuclear Power Plant in the city of Pripyat, then located in the Ukrainian USSR. An explosion and fire released large quantities of radioactive particles into the atmosphere, which spread over much of the western USSR and Europe.
24. (c) Thorium-rich monazite sand deposits on the Kerala coast have been responsible for natural

radioactive contamination. It has been pronounced on the south-west coastal line of the state. The region has been found to have elevated levels of background radioactivity due to high abundance of thorium.

25. (b) Photochemical smog which is mainly composed of ozone (O₃), Peroxyacetyl nitrate (PAN) and No., is also known as brown air where solar radiation is intense. In seasons of lesser solar radiation or areas, smog formation is incomplete and the air is referred to as grey air.
26. (a) An integrated circuit or monolithic integrated circuit (also referred to as an IC, a chip, or a microchip) is a set of electronic circuits on one small flat piece (or "chip") of semiconductor material that is normally silicon.
27. (b) H_2O
28. (b) Oxygen liberated during photosynthesis is coming out to create a stable, unstirred layer to support surface neutralization of acid and act as a protective physical barrier against luminal pepsin.
29. (b) Magnetic Resonance Imaging (MRI) is a medical imaging technique used in radiology to visualize internal structures of the body in detail. MRI makes use of the property of nuclear magnetic resonance (NMR) to image nuclei of atoms inside the body. An MRI scanner is a device in which the patient lies within a large, powerful magnet where the magnetic field is used to align the magnetization of some atomic nuclei in the body, and radio frequency fields to systematically alter the alignment of this magnetization. H_2O
30. (a) Humans are primates of the family Hominidae, and the only extant species of the genus Homo. They originated in Africa, where they reached anatomical modernity about 200,000 years ago. The species binomial Homo sapiens was coined by Carl Linnaeus in his 18th century work Systema Naturae, and he himself is the lectotype specimen. The generic name Homo is a learned 18th century derivation from Latin homo "man", ultimately "earthly being" (Old Latin homo, a cognate to Old English heort "man", meaning 'earth' or 'ground'). The species name sapiens means "wise" or "sapient". H_2O
31. (b) Apples are a great, healthy food, but even with the skin they do not contain a large amount of iron. Apples contain 11 milligrams of iron per 100 grams. A gram is a measure of weight. Fruit as a food group is not a great iron source but it does play an important role in our diet.
32. (d) Tortoises generally have lifespans comparable with those of human beings, and some individuals are known to have lived longer than 150 years. Because of this, they symbolize longevity in some cultures, such as China. The oldest tortoise ever recorded, and one of the oldest individual animals ever recorded, was MI Malila, which was presented to the Tongan royal family by the British explorer Captain Cook shortly after its birth in 1777. H_2O
33. (b) Of the many different forms of vitamin E, gamma-tocopherol (γ -tocopherol) is the most common form found in the North American diet, but alpha-tocopherol (α -tocopherol) is the most biologically active.
34. (c) High-density lipoprotein (HDL) is one of the five major groups of lipoproteins, which, in order of sizes, largest to smallest, are chylomicrons, VLDL, IDL, LDL, and HDL, which enable lipids like cholesterol and triglycerides to be transported within the water-based bloodstream. In healthy individuals, about thirty percent of blood cholesterol is carried by HDL. About one to one-third of blood cholesterol is carried by high-density lipoprotein (HDL). HDL cholesterol is known as "good" cholesterol, because high levels of HDL seem to protect against heart attack. Low levels of HDL (less than 40 mg/dL) also increase the risk of heart disease. H_2O
35. (c) Anemia is a decrease in number of red blood cells (RBCs) or less than the normal quantity of hemoglobin in the blood. However, it can include decreased oxygen-binding ability of each hemoglobin molecule due to deformity or lack in numerical development as in some other types of hemoglobin deficiency. Because hemoglobin (found inside RBCs) normally carries oxygen from the lungs to the capillaries, anemia leads to hypoxia (lack of oxygen) in organs. H_2O
36. (d) Splanchnology is the scientific study of the viscera and its organs. It studies the characteristics and structure of the visceral system of an animal. It is the study of viscera, which are the organs situated in the thoracic, abdominal and pelvic cavities of the body, and

are associated with pleura and peritoneum. There are four major systems identified in the viscera according to their functions, and they are the digestive system, the respiratory system, the urinary system, and the reproductive system. These four major systems are to process bodily intakes for metabolism such as nutrients and oxygen from surrounding and to remove the wastes from the body. One last function of the viscera is to ensure the survival of the species as a whole by conducting the process of reproduction.

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37. (b) Earthworms travel underground by the means of waves of muscular contractions which alternately shorten and lengthen the body. The shortened part is anchored to the surrounding soil by tiny claw-like bristles (setae) set along its segmented length. In all the body segments except the first, last and clitellum, there is a ring of S-shaped setae embedded in the epidermal pit of each segment (perichaetine). The whole burrowing process is aided by the secretion of lubricating mucus. Worms can make gurgling noises underground when disturbed as a result of the worm moving through its lubricated tunnels. They also work as biological "pistons" forcing air through the tunnels as they move.
38. (a) Cholesterol is defined as a waxy alcohol, fat-like substance that occurs naturally in all areas of the human body. Cholesterol is measured in milligrams per 100 millimetres of blood. The normal level of cholesterol varies between 150-200 mg per 100 ml. Any increase in cholesterol level leads to hypercholesterolemia or high cholesterol. Normal cholesterol is 180 mg/dl or 180 mg/144ml. < 200 mg/dl is considered to be normal blood cholesterol; 200-239 mg/dL borderline high; and > 240 mg/dl high cholesterol.
39. (c) The Mule is a cross between a donkey stallion (called a jack) and a horse mare. Mules ears are usually somewhat smaller than a donkeys, longer but the same shape as the horse parents. The mule's conformation will be a combination of traits from both parents. The head, hip and legs usually take after the jack. Mules do not have pronounced arches to the neck, even from breeds such as Arabians or Warm bloods. A slight arch or straight neck is preferable to a ewe, or upward curved neck.

40. (b) Cystitis is an infection of the urinary tract that is caused by bacteria. Anyone can develop cystitis, although it is more common in women.

41. (a) DNA, short for deoxyribonucleic acid, is the hereditary material in organisms that contains the biological instructions for building and maintaining them. Environmental DNA (eDNA) is nuclear or mitochondrial DNA that is released from an organism into the environment. Sources of eDNA include secreted feces, mucous, and gametes, shed skin and hair, and carcasses. eDNA can be detected in cellular or extracellular (dissolved DNA) form. So, Statement 1 is correct.

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The applications of e-DNA indicate a big potential to be used for the conservation of terrestrial vertebrates and is used to identify species in water bodies. And it could help understand the composition of animal communities and detect the spread of non-native species. So, Statement 2 is correct.

UNESCO launched global eDNA project to study vulnerability of species to climate change at marine World Heritage sites.

It will involve the collection by scientists and local residents of genetic material from waste, mucus or the cells of fish from across select marine World Heritage sites, with the aim of monitoring fish, including species red-listed by the International Union Conservation of Nature (IUCN). eDNA involves collecting and analyzing samples collected from the environment (soil, water, air) rather than an individual organism.

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So, Statement 3 is not correct.

42. (d) Negative ions are odorless, tasteless, and invisible molecules that we inhale in abundance in certain environments. Negative ion technology embeds negative ions in personal products and is currently being advertised as a means to maintain health, balance energy, and improve emotional well-being. Specifically, some commercially available silicone wristbands and kinesiology tapes commonly used by athletes and the general public promote the use of negative ion technology in their products. So, Statement 1 is correct.

According to a recent study done with the support of the International Atomic Energy Agency (IAEA) in the undergarment industry in Malaysia and elsewhere advertised that their

“negative ion undergarments” contain tourmaline, monazite, and zircon, and also known to involve the use of minerals that contain a naturally occurring source of radiation such as thorium or uranium. So, Statement 2 is correct.

43. (d) Conservation Agriculture (CA) is a farming system that can prevent losses of arable land while regenerating degraded lands. It enhances biodiversity and natural biological processes above and below the ground surface, which contribute to increased water and nutrient use efficiency and improved and sustained crop production.

Three principles of Conservation Agriculture are:

- Minimum mechanical soil disturbance (i.e., no-tillage)
- Permanent soil organic cover
- Species diversification

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So, Statement 1 is correct.

In Zero Tillage or No-Tilling farming practices, crop residue on the surface field is left over without ploughing to create more soil nutrients, and the organic materials or the plant residues that are left behind in no-tillage capture water, and this help keep the soil moist and minimize the evaporative effects of the wind and sun absorbs water in the soil or it facilitates the field's easier absorption of water or which lowers evaporation and reduces the water runoff, and irrigation efficiency is improved. So, Statement 2 is correct.

Zero tillage as an innovative approach provides farmers with a mechanized alternative to burning and tilling land between the rice harvest and wheat planting season as the rice straw was burned in the fields by farmers after harvest as the fastest and cheapest way to prepare the land for wheat planting.

The zero-tillage approach offers to sow wheat directly into paddies without ploughing the field using innovative machinery that can chop the leftover rice stalks, spread the residue evenly as mulch, and plant seeds into the soil without the need for clearing it. So, Statement 3 is correct.

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44. (a) The Losar festival, or Tibetan New Year, is a religious celebration in Ladakh. Tibetan Buddhists, who observe for 15 days, are the most enthusiastic people who celebrate. Tibetan

New Year marks the accordance with the lunar calendar. Arunachal Pradesh also observes the Losar festival. The Monpa tribe celebrates in the Tawang region, and here the festival lasts for three days. The Losar festival is also celebrated in Nepal. So, Pair 1 is not correct. The traditional festival Chapchar Kut is a popular spring festival celebrated by the Mizo people of Mizoram. The Chapchar Kut festival celebrates the completion of the jhum operations in the state.

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Jhumming or slash-and-burn agriculture is a cultivation technique used in woodland or forested terrains. It is celebrated in early March every year that marks the various stages of the agricultural cycle, the other two being Mim Kut and Pawl Kut. So, Pair 2 is not correct. On the banks of the Indus River in Leh, the Ladakh Singhey Khababs Sindhu Festival is held. The celebration emphasizes the Indus River as a symbol of India's complex cultural identity, which takes its name from the river. Local handicrafts and ethnic foods are displayed in front of tourists during the event, while folk songs and dances are performed. So, Pair 3 is correct.

Pandharpur Wari, also known as Wari (Vari), is a yearly yatra to Pandharpur, the home of the Hindu god Vithoba in the Indian State of Maharashtra. Whereas the tribes Santals are the largest tribe in Jharkhand and West Bengal side, and they are not native to Maharashtra. So, Pair 4 is not correct.

45. (d) 'Axiom Mission 1' is the first fully private mission to the International Space station with a four-member crew from startup company Axiom Space, marking a pivotal step toward Axiom Station, the world's first commercial space station.

Axiom, NASA and SpaceX have hailed the mission, which sees it as a key step in its goal to commercialize the Low earth orbit region of space known as the "LEO Economy or Low-Earth orbit economy". So, option (d) is correct.

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46. (b) All crops grown via vertical farming methods are usually over 95 per cent water efficient compared to crops grown through traditional agricultural practices. For a country like India, which consists of only around four per cent of the world's water resources, vertical

farming-based technologies can not only increase the efficiency and productivity of our food production but can also lead to a quantum leap in water savings, which in turn shall support and give impetus to India's ambitious goals of achieving carbon-neutrality within its food production ecosystem. So, statement 1 is correct.

The initial cost for vertical farming is higher than the traditional Farming method as the former includes,

- Controlled-entry clean rooms and proper Infrastructure,
- Well-calibrated grow lights,
- Machinery for planting and harvesting,
- Machine learning, robotics, and automation are also costlier.

Vertical farming is three to five times more expensive than growing on conventional outdoor farming. So, statement 2 is correct.

Most crops are grown "without the use of pesticides and fertilizers" in vertical farming.

Vertical farms use less fertilizer than traditional farms, as it can be applied directly to the roots of the plants, with any wastage being recycled and recirculated. This can have significant implications in a country that has budgeted INR 1.05 lakh crore (\$13 billion) fertilizers for 2022/23. This leads to "a positive contribution towards better public health".

So, statement 3 is not correct.

47. (d) Indian Researchers, in collaboration with France, have discovered a faint star-forming galaxy named "UVIT J2022", which is around 136 light years away, using the Ultraviolet Imaging Telescope (UVIT), which is India's first multi-wavelength astronomical observatory Astrosat in the sky. Faint Galaxies are galaxies with lower surface brightness than the surrounding sky. Such galaxies account for nearly 15% of the mass of the universe. So, option (d) is Correct.

48. (b) Avian influenza refers to disease in birds caused by avian (bird) influenza (flu) Type A viruses. These viruses occur naturally among wild aquatic birds worldwide and can infect domestic poultry and other bird and animal species. So, statement 1 is correct.

Although avian (bird) influenza (flu) A viruses majorly do not infect people, there have been

some rare cases of human infection with these viruses. Illness in humans from bird flu virus infections have ranged in severity from no symptoms or mild illness to severe disease that resulted in death. Asian lineage H7N9 and highly pathogenic avian influenza Asian lineage H5N1 viruses have been responsible for most human illness from bird flu viruses worldwide to date, including the most serious illnesses and illness with the highest mortality. So, statement 2 is correct.

Infected birds shed bird flu virus through their saliva, mucous and feces. Human infections with bird flu viruses can happen when virus gets into a person's eyes, nose or mouth, or is inhaled. This can happen when virus is in the air (in droplets or possibly dust) and a person breathes it in, or possibly when a person touches something that has virus on it then touches their mouth, eyes or nose. So, statement 3 is not correct.

Recently, China has recorded the first human infection with the H3N8 strain of bird flu, but the risk of it spreading among people was low. Whereas, H7N9 virus have been already recorded in February 2013 which has affected more than 100 persons in China. So, statement 4 is not correct.

49. (c) Shinku-la pass is 40 km from Darcha, a tiny hamlet in Himachal's Lahaul on the Manali-Leh highway. The Shinkula Pass, an altitude of 16,580 feet, connects the Zaskar Valley of Ladakh to Lahaul of Himachal Pradesh. Thus, Shinku La Pass is bordering between Ladakh and Himachal Pradesh. So, Option (c) is correct.
50. (d) The Republic of Belarus is located in the center of Europe and is part of Eastern Europe. It shares a border with five countries such as,
- Poland in the west,
 - Lithuania in the northwest,
 - Latvia and the Russian Federation in the north,
 - the Russian Federation in the northeast and east,
 - Ukraine in the south
- So, Option (d) is correct.
51. (b) Marine Gondwana Fossil Park is located at Manendragarh, Sarguja district in Chattisgarh is a unique exposure of fossiliferous marine

Permian rocks of the Talchir Formation belonging to the Gondwana Supergroup. So, Pair 1 is correct.

Akal Fossil Wood Park is located in the Jaisalmer District of Rajasthan. The area is located near Akal, 18 km South East from Jaisalmer on the NH-15. So, Pair 2 is not correct.

Siwalik Fossil Park is located at Saketi, Sirmur District in Himachal Pradesh contains a rich collection of 2.5 million years old vertebrate fossils from Siwaliks. It covers an area of about 1.5 sq. km at Saketi, in the Markanda valley of Sirmur district, H.P., and was built to check indiscriminate destruction of fossil bones. So, Pair 3 is not correct.

Stromatolite Park, Bhojunda, is located in the Chittorgarh District of Rajasthan, and it is an exposure to the massive Bhagwanpura Limestone of the Lower Vindhyan age. Stromatolites are structures produced by blue-green algae, which through their filaments, attract and bond carbonate particles forming a mat. So, Pair 4 is correct.

52. (d) HANSA-NG is India's first indigenous Flying Trainer aircraft designed and developed by CSIR-National Aerospace Laboratories, Bangalore. It is one of the most advanced flying trainers powered by a Rotax Digital Control Engine with unique features like a Just-In-Time Prepreg (JIPREG) Composite light weight Airframe, Glass Cockpit, Bubble Canopy with wide panoramic view, electrically operated flaps, etc. So, Option (d) is correct.

53. (b) Recently the Colombo Security Conclave Virtual Conference on Sharing experiences in investigating terrorism cases was organized by the National Investigation Agency of India. The Colombo Security Conclave adopted a road map for cooperation and collaboration in areas such as maritime security, counterterrorism, and drug trafficking.

The members of the Colombo Security Conclave include India, Maldives, Mauritius, and Sri Lanka, while Bangladesh and Seychelles are the two observer nations who shared their views in this conclave. So, Option (b) is correct.

54. (c) Biological and toxin weapons use microorganisms like viruses, bacteria, fungi, or toxic substances produced by living

organisms that are produced and released deliberately to cause disease and death in humans, animals, or plants.

The Biological Weapons Convention (BWC) effectively prohibits the development, production, acquisition, transfer, stockpiling and use of biological and toxin weapons. So, Statement 1 is correct.

India signed the Biological and Toxin Weapons Convention (BTWC) in 1973, became a party, and ratified the treaty in 1974. So, Statement 2 is not correct.

The Biological Weapons Convention (BWC), which effectively prohibits biological and toxin weapons, was opened for signature in 1972 and came into force in 1975. So, Statement 3 is not correct.

55. (d) Sohrai murals are an art that adorns walls during ceremonies or special occasions, such as weddings and childbirth. It varies across regions, prominently featuring geometric shapes. The prominence given to geometry in the murals can be linked with the Santhal community's affinity for symmetrical precision in its architecture. These murals are a part of the tradition of the Santhal community. Santhali women usually paint the walls of their houses to mark Sohrai, a harvest festival coinciding with Diwali or Kali Puja. So, Option (d) is correct.

56. (d) Ecology is the study of interactions between living things, such as humans, and their natural surroundings. It aims to comprehend the essential links between plants, animals, and their environment.

About Deep Ecologism:

➤ It is a type of ecologism which aspires to sustain nature by making large scale changes to our lifestyle.

➤ Deep ecologism believes that individuals must fundamentally change how they interact with the natural world.

➤ Its supporters condemn superficial ecologism for maintaining the environmentally harmful way of life in contemporary civilizations by placing people above other forms of life.

➤ It contends that by sustaining this way of life, superficial eco-feminism increases the disparities between nations.

➤ These could involve restricting commercial meat production to protect forests and lessen

the unnatural fattening of animals or reconfiguring internal combustion engine-based transportation networks.

So, Option (d) is correct.

অ্যাচিভার্স

57. (b) People's Biodiversity Register is a document which contains comprehensive information on locally available Bio-resources (Bio-resources mean plants, animals, and microorganisms, their genetic material and byproducts with actual or potential use or value but does not include human genetic material). It also includes the landscape and demography of a particular area or village. So, Statement 1 is correct and Statement 2 is not correct.

As per the Biological Diversity Act of 2002, one of the main functions of the Biodiversity Management Committee (BMC) is to prepare the People's Biodiversity Register in which the biological diversity including preservation of habitats, conservation of land races, folk varieties & cultivars, domesticated stocks and breeds of animals and micro-organisms and chronicling of knowledge relating to the biological diversity of the area is documented. So, Statement 3 is correct.

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58. (d) A new species of old world monkey, 'Sela macaque' recorded from Arunachal Pradesh, has been named after a strategic mountain pass at 13,700 ft above sea level, located on the border between the Tawang and West Kameng districts of Arunachal Pradesh. So, Option (d) is correct.
59. (d) Money spiders, commonly found in European meadows, have been reported for the first time in the country from the Muthanga range of the Wayanad Wildlife Sanctuary. The species is called so as it is "believed to bring luck" to the person who comes in contact with it. So, Option (d) is correct.
60. (d) NASA'S InSight, short for Interior Exploration using Seismic Investigations, Geodesy, and Heat Transport, is a Mars lander designed to give the Red Planet its first thorough checkup since it formed 4.5 billion years ago. It is the first outer space robotic explorer to study in-depth the "inner space" of Mars: its crust, mantle, and core.

This lander has recently found a monster marsquake and it has a magnitude of 5 temblors. This Marsquake has been the largest ever recorded tremor on a planet other than

earth, hence earning it the name of 'Monster Quake'. So, Option (d) is correct.

61. (d) Air Independent Propulsion System is a system that allows diesel-electric submarines to recharge their batteries without running their engine. They do not require to access atmospheric oxygen by surfacing or by using a snorkel. Air Independent Propulsion (AIP) is implied to improve the underwater endurance of the submarines, particularly at high speed. The air-independent propulsion system will enable the submarines to stay submerged for longer duration at higher speeds and thus increase their operational range. So, Option (d) is correct.

অ্যাচিভার্স

62. (a) The State animal of Madhya Pradesh in the Barasingha (12-antlered deer) is Rucervus duvaucelii also called swamp deer, and it is also the state animal of Uttar Pradesh. So, Statement 1 is correct.

Swamp Deer usually gives birth to only a single young, and the gestation period is between 240 to 250 days which can be 6 to 8.5 months. So, Statement 2 is correct.

Swamp Deer is listed as Vulnerable in the IUCN Red list, not as 'Endangered.'

Protection Status of Swamp Deer: CITES Appendix I

Wildlife Protection Act of India, 1972: Schedule I. So, Statement 3 is not correct.

63. (d) Sunda strait lies between the Java and Sumatra islands, connecting the Java Sea to the Indian Ocean. So, Option (d) is correct.
64. (d) Chagos Island and Diego Garcia are disputed islands between United Kingdom and Mauritius which are located in the Indian ocean.
65. (b) ➤ Hamas is a militant movement and one of the Palestinian territories' two major political parties. It governs more than two million Palestinians in the Gaza Strip, but the group is best known for its armed resistance to Israel. ➤ The United States and European Union have designated Hamas a terrorist organization because of its armed resistance against Israel, which has included suicide bombings and rocket attacks.

অ্যাচিভার্স

So, Pair (1) is correct.

Tsirkon missile is a scramjet powered maneuvering anti-ship hyper sonic cruise missile produced by Russia. So, Pair (2) is not correct.

Iran unveiled a new missile named Khaibar-buster. It has solid fuel and a range of 1,450 kilometers, or 900 miles. This missile has high accuracy, and manufactured completely domestically, and can defeat missile shield systems. So, Pair (3) is not correct.

Barak 8 is a long range surface to air missile jointly developed by India and Israel. Barak 8 is being considered to be a major asset for Indian Navy because it would add a potent system designed to destroy any anti-ship missile launched by Pakistani or Chinese navy. So, Pair (4) is correct.

66. (b) The Clouded Leopard is a wild cat found across the dense forests of southeast Asia and the eastern Himalayas. It has the special features such as,
- Using its tail for balancing when moving in trees
 - Climbing down vertical tree trunks headfirst.
 - Resting in trees during the day and hunting by night on the forest floor.

Its IUCN status is Vulnerable and not Endangered.

Recently, For the First time clouded leopard was sighted at the Nagaland mountains.

So, Statement 1 is not correct and 2 is correct.

Clouded Leopard is the state Animal of Meghalaya. Clouded Leopard in Mizoram locally called as 'Kelral' which is seen across the Dampa Tiger Reserve. But Clouded Leopard National Park is located in Tripura. It is a national park in the Sepahijala Wildlife Sanctuary, Tripura. So, Statement 3 is not correct.

67. (d) The Zaporizhzhia nuclear power plant was built between 1984 and 1995. It is located in the city of Enerhodar, on the banks of the Dnieper river, just 200 kilometres from the conflicted Donbas region where Russian-backed separatists and Ukrainian forces have been fighting.

It is Europe's largest nuclear power plant and the ninth largest in the world. It has six reactors, each generating 950MW, and a total output of 5,700MW, enough to power four million households.

Nuclear Power Plants in Ukraine:

So, Option (d) is correct.

68. (a) Millets are nutritious, non-glutinous or gluten-free (non-sticky) and are not acid-forming foods(anti-acidic).

So, Statement 1 is correct.

Millets are also rich in calcium and magnesium. The Finger Millet, also known as Ragi, has the highest content of calcium (344mg%) among all the cereals and millets. So, Statement 2 is correct.

Indian Institute of Millets Research (IIMR) is a premier agricultural research institute engaged in strategic research on sorghum and other millets under Indian Council of Agricultural Research (ICAR). It is located at Rajendranagar, Hyderabad, Telangana. So, Statement 3 is not correct.

69. (b) The Hindus in Kashmir, locally known as Pandits, will celebrate the Zvestha Ashtami at the Mata Kheer Bhawani temple at Tulmulla in central Kashmir's Ganderbal.

The festival Mela Kheer Bhawani is the largest gathering of Hindus in Kashmir after the annual Amarnath Yatra.

The temple is dedicated to the goddess Ragnya Devi. Therefore, the Mela Kheer Bhawani festival is in Jammu and Kashmir, not Madhya Pradesh. So, Pair (1) is not correct.

In Goa, the Sao Joao festival is celebrated for the feast of St John the Baptist (John the Baptist because he had baptised Jesus Christ on the river Jordan) with traditional enthusiasm.

The festival includes revellers sporting crowns made of fruits, flowers and leaves.

The major draw of the feast is the water bodies like wells, ponds, fountains, and rivers in which the revellers take the "leap of joy" and play the traditional gumott, a percussion instrument, a boat festival, servings of feni (Feni is a spiritous liquor indigenous to the state of Goa) and a place of pride for new sons-in-law. So, Pair (2) is correct.

Baikho festival is celebrated in Assam, the spring festival, and it is meant to bring in an auspicious harvest season filled with abundant crops and good health. So, Pair (3) is correct.

Mandu Mahotsav, a three-day festival, is celebrated in Madhya Pradesh and comprises music, arts and culture.

The Mandu festival is celebrated by an

amalgamation of cultural activities and adventure sports.

The festival thrived in delivering a unique experience with soul-stirring and foot-tapping performances by local artists. Therefore, Mandu Festival is in Madhya Pradesh, not in Jammu and Kashmir. So, Pair (4) is not correct.

70. (c) Dutch Disease in economics refers to a phenomenon wherein a country witness uneven growth across sectors due to the discovery of natural resources, especially large oil reserves. So, Option (c) is correct. অ্যাচিভার্স

71. (d) The ribbon weed or *Posidonia australis*, the world's largest plant has been discovered in Shark Bay by a group of researchers from Flinders University and The University of Western Coast of Australia. These researchers have also found that the plant is 4,500 years old, is sterile, has double the number of chromosomes than other similar plants, and has managed to survive the volatile atmosphere of the shallow Shark Bay.

➤ The huge size of this ribbon weed is 180 km in length, and it covers an area of 20,000 hectares. Seagrasses have been called "the lungs of the sea" because they release oxygen into the water through the process of photosynthesis.

So, Option (d) is correct. অ্যাচিভার্স

72. (d) ➤ The Ujh project is a multipurpose (Hydropower, Irrigation and Drinking) River valley scheme in Jammu and Kashmir State.

➤ The proposed project is on the River Ujh, which is one of the main tributary of River Ravi.

➤ The Ujh Multipurpose Project after completion has the irrigation potential of 91,073 hectare, with a power generation capacity of 89.50 MW. So, Option (d) is correct.

73. (c) ➤ Gaza strip is located on the eastern coast of the Mediterranean Sea and borders Egypt on the southwest and Israel on the east. It is a Palestine enclave. অ্যাচিভার্স

➤ The Golan Heights is a rocky plateau at the southern end of the Anti-Lebanon Mountains. It borders Syria and Israel. Israel currently occupies about two-thirds of the territory it seized in the 1967 Six-Day War and annexed in 1981, while Syria holds the remaining one-

third. Hence Israel is the only country that borders both the Gaza Strip and Golan heights.

74. (a) Ol Chiki script is the official writing system of the Santhali language, a very important language in India. It is invented by Pandit Raghunath Murmu in the year 1925 is the official writing system for Santali. In Eastern India, a vast community in Jharkhand, West Bengal, Odisha, Assam, and other Northeastern states speak and write in Santhali. So, Option (a) is correct.

75. (a)

76. (c)

77. (b)

78. (c)

79. (b)

80. (d)

81. (b) The Indore Municipal Corporation's (IMC) Green Bonds have been listed on the National Stock Exchange (NSE), marking the first-ever green bond issue by a municipal corporation in India.

i. The public issue of IMC green bonds was subscribed 5.91 times the issue size. This issue will provide momentum for the advancement of green financing and aid in India's goal of moving towards clean and sustainable energy.

ii. There is an exponential increase in the global green bond market, which has now surpassed \$2 trillion in cumulative green bond issuance.

iii. From 2019 to 2022, Indian corporations, public sector undertakings (PSUs), and financial institutions have collectively issued green bonds totaling approximately \$10.8 billion.

82. (d) India's first Marine Spatial Planning (MSP) Framework was launched in Puducherry as a part of a pact under the Indo-Norway Integrated Ocean Initiative.

• Puducherry and Lakshadweep were chosen as coastlines to pilot the MSP initiative after the 2019 Memorandum of understanding (MoU) between India and Norway that envisaged the collaboration on implementing MSP in Oceanic space.

i. Lt. Governor of Puducherry Tamilisai Soundararajan along with Chief Minister of Puducherry N. Rangasamy, released 'The Shoreline Change Atlas of the UT of Puducherry' during the event. অ্যাচিভার্স

ii. What is MSP: It is a process of allocating spaces in marine zones for human activities

like economic purposes, ecological purposes, or social purposes. MSP is a spatial planning approach based on the principles of ecosystem management.

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83. (c) On the occasion of International Mother Language Day (21st February 2023), the Kerala High Court (HC) published 2 of its recent judgments and became the 1st HC in India to publish its judgments in the regional language.

i. The judgments passed by a division bench of Chief Justice S. Manikumar (WA 926/2016) and Justice Shaji P. Chaly (WA 1638/2022) in January 2023 were published in Malayalam on the High Court's website.

ii. On 2023 Republic Day, the supreme court also proposed to release 1,268 of its judgments in 13 Indian languages.

• Translated Judgments in Supreme Court: 1,091 judgments had been translated to Hindi, 21 to Odia, 14 to Marathi, 4 to Assamese, 1 to Garo, 17 to Kannada, 1 to Khasi, 29 to Malayalam, three to Nepali, 4 to Punjabi, 52 to Tamil, 28 to Telugu and 3 to Urdu.

84. (d) Girish Chandra Murmu (G.C. Murmu), Comptroller and Auditor General (CAG) of India, has been selected as External Auditor of the International Labour Organisation (ILO) in Geneva, Switzerland, for a 4-year term (2024-2027).

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• CAG Girish Chandra Murmu will replace the incumbent external auditor of ILO, Jose Callangan Calida, Chairperson of the Commission on Audit (COA), the Supreme Audit Institution of the Republic of the Philippines.

i. Girish Chandra Murmu assumed office as the 14th Comptroller and Auditor General (CAG) of India on 8th August 2020.

ii. Girish Chandra Murmu is currently the external auditor of the Inter-Parliamentary Union (2020-2022), World Health Organization (2020-2023), Food and Agriculture Organization (2020-2025), Organization for Prohibition of Chemical Weapons (2021-2023), and International Atomic Energy Agency (2022-2027).

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85. (d) Roshi Augustine, Minister of Water Resources, launched a robotic scavenger "Bandicoot", in Guruvayur in Thrissur district, Kerala and noted that the robotic technology would be extended throughout the state. With this, Kerala becomes the 1st state in India to use robotic technology

to clean all its commissioned manholes and drainage.

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i. The Bandicoot was launched under the Guruvayur Sewerage Project by the Kerala Water Authority (KWA) as a part of the Kerala Government's 100-day action plan.

ii. Bandicoot, the world's 1st robotic scavenger, was developed as a Make in India and Swachh Bharat Abhiyan initiative by Kerala-based Genrobotics, National Award winning Robotics startup that focuses on developing robotic technologies for solving social issues.

• Genrobotics has received the 'Kerala Pride' award at the Huddle Global 2022 conclave organised by the Kerala Startup Mission (KSUM) for Bandicoot innovation.

86. (c) Govindaraj Kamareddy (K Govindaraj), President of the Basketball Federation of India (BFI), was unanimously nominated as the President of FIBA Asia, a zone within the International Basketball Federation (FIBA – Federation Internationale de Basketball Amateur) which contains all 44 Asian FIBA federations. He became the 1st Indian to be elected as FIBA Asia President.

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i. K Govindaraj will replace Qatar's Sheikh Saud Ali Al Thani, who is currently serving his 4th five-year term as President of FIBA Asia. He has been president of FIBA Asia since 2002.

ii. Indian National Congress activist K Govindaraj is currently serving as a member of the Karnataka Legislative Council (KLC) and Vice-President of the Indian Olympic Association (IOA).

iii. Presently, Govindaraj Kamareddy serves as the Director of the Indian Cost Accountants Institute, a Government of India Nominee.

87. (d) On 25th February 2023, Himanta Biswa Sarma, Chief Minister (CM) of Assam, laid the foundation stone of 5-tonne-per-day-capacity compressed biogas (CBG) plant, North East India's first ever CBG plant, at Damara Pathar, Sonapur in Kamrup (Metropolitan) district, Assam. The plant is proposed to be operational from November 2023.

i. The First of its kind CBG plant is being built by entrepreneurs Pankaj Gogoi and Rakesh Doley under the banner of Redlemon Technologies Pvt Ltd based in Guwahati, Assam.

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- ii. The biogas unit in Sonapur, Assam, is being set up under the Centre's Sustainable Alternative Towards Affordable Transportation (SATAT) scheme.
88. (d) Karnataka Chief Minister(CM) Basavaraj Bommai confirmed that Karnataka is set to get India's 1st Marina to promote coastal tourism during the event "Seven Wonders of Karnataka" hosted under the Department of Tourism, Government of Karnataka. **অ্যাচিভমেন্ট**
- i. The Karnataka government has also proposed to build a corridor of ancient temples like Madhukeshwara in Banavasi and Dattatreya in Ganagapura and promote 'Yatra tourism'.
89. (a) The Australian women's national cricket team captained by Meg Lanning won the 8th edition of the International Cricket Council (ICC) Women's Twenty20 (T20) World Cup 2023 by defeating South Africa women's team captained by Sune Luus by 19 runs in the finals held in the Newlands Cricket Ground in Cape Town, South Africa.
- i. This marks the 6th and third consecutive ICC Women's T20 World Cup title of Australia. Australia previously won the title in 2010, 2012, 2014, 2018 and 2020.
- ii. ICC women's T20 World Cup 2023 was hosted by South Africa from 10th to 26th February 2023.
- iii. With this Australian Skipper Meg Lanning became the only cricket captain to win five ICC titles, surpassing fellow Australian Ricky Ponting in the process. **অ্যাচিভমেন্ট**
90. (d) On February 13, 2022, The Boeing Company, an aerospace company based in the United States of America (USA), launched its first Global Support Center (GSC) in India at Gurugram, Haryana.
- i. Indian civil aviation sector is all set to become the world's third largest passenger market after the U.S. and China.
- ii. Currently, India operates a fleet of Boeing aircraft, including 11 C-17s, 22 AH-64 Apaches (with an additional 6 on order), 15 CH-47 Chinooks, 12 P-8Is, 3 VVIP aircraft, and 2 Head of State aircraft. **অ্যাচিভমেন্ট**
- iii. Seven teams comprising university students and early stage start-up entrepreneurs became the winners of Boeing University Innovation Leadership Development (BUILD) program 2022-23.
91. (b) On February 14, 2023, the Reserve Bank of India (RBI) launched its 2nd global hackathon 'HARBINGER 2023 - Innovation for Transformation' on the theme 'Inclusive Digital Services'. **অ্যাচিভমেন্ট**
- i. The first hackathon was announced in November 2021 and results were declared in June 2022. It had received 363 proposals submitted by teams from within India and from 22 other countries including the US, UK, Sweden, Singapore, Philippines, and Israel.
92. (a) EbixCash World Money Limited, a subsidiary of US-based Ebix Inc, became the first company in India to launch Unified Payments Interface (UPI) transactions for foreign nationals visiting India.
- i. In January 2023, the NPCI approved UPI transactions for non-resident bank accounts such as NonResident External (NRE) and Non-Resident Ordinary (NRO) linked to international mobile numbers.
- ii. Initially, transactions from mobile numbers of Non-resident Indians (NRIs) from 10 countries would be allowed: Singapore, Australia, Canada, Hong Kong, Oman, Qatar, the United States of America (USA), Saudi Arabia, the UAE, and the United Kingdom (UK)
93. (d) World Bank President David Malpass (66) announced that he will step down from his position by the end of the Bank Group's fiscal year on June 30, 2023 after serving more than 4 years. **অ্যাচিভমেন্ট**
- i. He was appointed by then United States (US) President Donald Trump in April 2019. His five-year term was due to end in April 2024.
94. (d) Velocity, a Homegrown financial technology firm, launched "Lexi", India's 1st Artificial intelligence (AI) Chatbot integrated with OpenAI's ChatGPT (Chat Generative Pre-trained Transformer), an AI computer program
- i. The company has integrated this latest advancement in AI with its existing analytics tool, 'Velocity Insights'.
- ii. By providing AI-powered business insights in a conversational way and saving time for important business operations, the combination of ChatGPT and Velocity Insights empowers eCommerce entrepreneurs.
95. (d) The Reserve Bank of India (RBI) issued final guidelines on "Interest Rate Risk in Banking Book" (IRRBB), which mandate banks to

measure, monitor, and disclose their exposure to IRRBB, which may have an impact on lenders' capital base and future earnings.

i. The final IRRBB guidelines are consistent with the revised framework issued by the Basel Committee on Banking Supervision (BCBS).

ii. The Board/ALCO (Asset-Liability Committee) is in charge of establishing adequate limits on IRRBB, valuing positions, and evaluating performance.

96. (a) Paytm Payments Bank Limited (PPBL) has launched UPI LITE, a feature enabled by the National Payments Corporation of India (NPCI) for multiple small-value UPI transactions. UPI Lite allows transactions of up to Rs 200 without using a UPI PIN.

i. The Reserve Bank of India (RBI) introduced the UPI LITE feature, designed by NPCI, in September 2022.

ii. With more than 1,726.94 million transactions in December 2022, PPBL continued to lead all other major Indian banks as the largest UPI beneficiary bank for 19 months in a row.

97. (c) The World's Highest Weather Station, which was installed by the National Geographic Society (NatGeo), has been rebuilt on Mount Everest after it was destroyed due to hurricane-force winds on Mt. Everest.

- A team of scientists and Sherpa have again placed its new version atop Mt Everest.

- The group has been led by Tenzing Gyalzen Sherpa, a 31-year-old electrician and mountain guide.

i. According to the Guinness World Records report, the team of mountaineers and scientists of NatGeo installed a record-breaking weather station in 2022 at an altitude of 8,810 metres (28,904 ft); just 39 metres (128 ft) below Everest's summit.

ii. The station will be fully operated by NatGeo till 2025 before transferring the technology to the Nepal Government in 2026.

98. (b) In February 2023, India's first-ever Indigenous Automatic Train Supervision System (i-ATS) was launched for operations on the Delhi Metro's 1st corridor Red Line (Rithala to Shaheed Sthal) from the Operations Control Centre (OCC) in Shastri Park by Manoj Joshi, Secretary of Union Ministry of Housing and

Urban Affairs, and Chairman of Delhi Metro Rail Corporation (DMRC).

i. It has been developed by a joint team of DMRC and Bharat Electronics Limited (BEL), under the government of India's 'Make in India' and 'Aatmanirbhar Bharat' initiatives for metro rail transit systems.

ii. DMRC stated about the launch of India's first virtual shopping app for the metro, 'Momentum 2.0', which will allow users to make a variety of purchases and schedule a variety of services.

99. (a) The 3rd edition of Badminton Asia Mixed Team Championships 2023/Tong Yun Kai Cup 2023 (official and sponsored title: Blue Ocean Badminton Asia Mixed Team Championship Dubai 2023) was held from February 14-19, 2023 at Dubai Exhibition Centre in Dubai, United Arab Emirates (UAE).

i. The championship was won by China with the Gold medal by defeating South Korea 3-1. With this, South Korea stood at 2nd position with a Silver medal.

ii. The 3rd position or Bronze medal was shared by India and Thailand. 17 teams represented all five regions in Asia

iii. India created history by securing its first-ever medal at Badminton Asia Mixed Team Championship-2023.

100. (d) Union Minister for Road Transport and Highways, Nitin Gadkari, laid the Foundation Stone of the world's largest and unique 'Divyang Park – Anubhuti Inclusive Park' in Nagpur, Maharashtra. About Divyang Park – Anubhuti Inclusive Park:

i. Nitin Gadkari has mentioned Divyang Park – Anubhuti Inclusive Park as the world's first inclusive disabled park.

ii. The Ministry of Social Justice and Empowerment (MSJE), Government of India, has provided the provision of about Rs 12 crore for this park which has been built on 90,000 square feet.

iii. The park will have facilities for all 21 types of disabilities and this park acts as an initiative taken under the Rights of Persons with Disabilities Act, 2016 (RPWD Act).