

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

**QUESTION )** Which of the following statement is correct with respect to Quasi Ballistic Missile?

- (A) It has low trajectory but can perform maneuvers in flight or make unexpected changes in direction and range.
- (B) It is a missile that follows a sub-orbital ballistic flightpath with the objective of delivering one or more warheads to a predetermined target.
- (C) It is terrain hugging missiles which are self-navigating, and can fly on a non- ballistic, extremely low altitude trajectory.
- (D) None of the above.

Answer: A

A quasi ballistic missile (also called a semi ballistic missile) is a category of missile that has a low trajectory and/or is largely ballistic but can perform maneuvers in flight or make unexpected changes in direction and range.

At a lower trajectory than a ballistic missile, a quasi ballistic missile can maintain higher speed, thus allowing its target less time to react to the attack, at the cost of reduced range.

**QUESTION )** Which of the following statements is/are the correct with reference to the heart?

- (1) Angioplasty: it opens narrowed arteries.
- (2) Stent: involves implanting a mesh-like metal device into an artery at a site narrowed by plaque.

- (3) Pacemaker: is a surgically implanted device that helps to regulate heartbeat.

Select the correct answer using the codes given below:

- (A) 1 and 2
- (B) 2 and 3
- (C) Only 3
- (D) All

Answer: D

Angioplasty, which opens narrowed arteries, is performed by interventional cardiologists. They use a small balloon- tipped catheter that they inflate at the blockage site to flatten the plaque against the artery wall. A thin wire is inserted into an artery in the leg and is guided to the site of narrowing in the coronary artery. The catheter is slipped over this guidewire and positioned at the blockage, where the balloon is inflated. After treatment, the wire, catheter, and balloon are removed. The hospital stay and recovery time for this procedure are shorter than that of bypass.

A stent procedure is often used in conjunction with balloon angioplasty. It involves implanting a mesh-like metal device into an artery at a site narrowed by plaque. The stent keeps the vessel open for proper blood flow.

A pacemaker is a surgically implanted device that helps to regulate heartbeat. Pacemakers use batteries to produce electrical impulses that make the heart pump. The impulses flow through tiny wires (called leads) that are attached to the heart. The impulses are timed to flow at regular intervals.

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

**QUESTION )** Which of the following applications are related to concept of superconductivity?

- (1) In Maglev trains
- (2) In MRI
- (3) In Magnetic confinement fusion reactors

Codes:

- (A) 1 and 2
- (B) 2 and 3
- (C) 1 and 3
- (D) All

Answer: D

Superconductivity is a phenomenon of exactly zero electrical resistance and expulsion of magnetic flux fields occurring in certain materials, called superconductors, when cooled below a characteristic critical temperature:

Some of the technological applications of superconductivity include:

- The production of sensitive magnetometers based on SQUIDs
- Fast digital circuits (including those based on Josephson junctions and rapid single flux quantum technology),
- Powerful superconducting electromagnets used in maglev trains, Magnetic Resonance Imaging (MRI) and Nuclear magnetic resonance (NMR) machines, magnetic

confinement fusion reactors (e.g. tokamaks), and the beam-steering and focusing magnets used in particle accelerators

**QUESTION )** Which of the following statements is/are true about Radio broadcasting?

- (A) It is a unidirectional wireless transmission over radio waves intended to reach a wide audience.
- (B) AM radio is a mode of broadcasting by varying the amplitude of the carrier signal in response to the amplitude of the signal to be transmitted.
- (C) In India All India Radio is the national public broadcaster and a division of Prasar Bharati.
- (D) All of the above.

Answer: D

Radio broadcasting can be AM or FM (frequency modulation).

In telecommunications and signal processing, frequency modulation (FM) is the encoding of information in a carrier wave by varying the instantaneous frequency of the wave.

Amplitude modulation (AM) is a modulation technique used in electronic communication, most commonly for transmitting information via a radio carrier wave. In amplitude modulation, the amplitude (signal strength) of the carrier wave is varied in proportion to the waveform being transmitted.

**QUESTION )** Consider the following statements regarding transportation in plants.

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(1) Transport over longer distances proceeds through the vascular system and is called translocation.

(2) In rooted plants, transport of water through phloem is essentially unidirectional, from roots to the stems.

(3) In rooted plants, transport of Organic and mineral nutrient is multidirectional.

Choose the correct answer using the codes given below

(A) 1 only

(B) 2 and 3 only

(C) 1 and 3 only

(D) All of the above

ANS: C

Statement 1 is correct as in a flowering plant the substances that would need to be transported are water, mineral nutrients, organic nutrients and plant growth regulators. Over small distances substances move by diffusion and by cytoplasmic streaming supplemented by active transport. Transport over longer distances proceeds through the vascular system (the xylem and the phloem) and is called translocation.

Statement 2 is incorrect and 3 is correct as an important aspect that needs to be considered is the direction of transport. In rooted plants, transport in xylem (of water and minerals) is essentially unidirectional, from roots to the stems. Organic and mineral nutrients however, undergo multidirectional transport. Organic compounds synthesised in the

photosynthetic leaves are exported to all other parts of the plant including storage organs. From the storage organs they are later re-exported.

**QUESTION )** Consider the following statements about Bernoulli's principles

(1) It describes how the speed of air and pressure in air are related.

(2) Helicopter works on this Principle.

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

ANS: C

Statement 1 is correct: The Bernoulli's Principle describes how the speed of air and pressure in the air are related. When the speed goes up, the pressure goes down and the opposite is also true. Statement 2 is correct: Wings are curved on top and flatter on the bottom. This shape is called an airfoil. That shape makes air flow over the top faster than under the bottom. As a result, there is less air pressure on top of the wing; this causes suction and makes the wing move up. A helicopter's rotor blades are wings and create lift. An airplane must fly fast to move enough air over its wings to provide lift. A helicopter moves air over its rotor by spinning its blades.

**QUESTION )** Which of the following statements is/are correct regarding "SAM"?



## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(1) It is world's first Artificial Intelligence virtual politician.

(2) It is a joint initiative by Google and Facebook.

Select the correct answer using code given below:

(A) 1 only

(B) 2 only

(C) Both 1 and 2

(D) Neither 1 nor 2

ANS: A

Statement 1 is correct but 2 is incorrect: Scientists have developed the world's first artificial intelligence politician that can answer a person's queries regarding local issues such as policies around housing, education and immigration. The virtual politician, called SAM, was created by Nick Gerritsen, an entrepreneur in New Zealand. While the system is not perfect, it may still help bridge the growing political and cultural divide in many countries.

**QUESTION )** What is meant by 'electroplating'?

(A) The process of depositing a layer of any desired metal on another material by means of electricity.

(B) The process of diffusing Aluminium into the steel surface at an elevated temperature.

(C) This process is an electrolytic passivation used to increase the thickness of the natural oxide layer on the surface of metal parts.

(D) None of the above

ANS: A

The process of depositing a layer of any desired metal on another material, by means of electricity, is called electroplating. The process of diffusing Aluminium into the steel surface at an elevated temperature is called calorising. Anodising is an electrolytic passivation process used to increase the thickness of the natural oxide layer on the surface of metal parts.

**QUESTION )** Which of the following is/are based on Archimedes Principle?

(1) Submarines are designed on the basis of this principle.

(2) Lactometers, which are used to determine the purity of a sample of milk.

(3) Scuba divers operate through this principle.

Select the correct answer using the codes given below:

(A) 1 and 3 only

(B) 2 only

(C) 1 and 2 only

(D) None of the above

ANS: C

Archimedes' principle, stated as follows: When a body is immersed fully or partially in a fluid, it experiences an upward force that is equal to the weight of the fluid displaced by it.

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

Statement 1 and 2 are correct: Archimedes' principle has many applications. It is used in designing ships and submarines. Lactometers, which are used to determine the purity of a sample of milk and hydrometers used for determining density of liquids, are based on this principle.

Statement 3 is incorrect: Scuba divers operate through Pascal's principle. The French scientist Blaise Pascal observed that the pressure in a fluid at rest is the same at all points if they are at the same height.

**QUESTION )** The National Centre for Antarctic and Ocean Research (NCAOR) comes under the aegis of?

- (A) Ministry of Earth Sciences
- (B) Ministry of Science & Technology
- (C) Ministry of Environment, Forest and Climate Change
- (D) Prime Minister's office

ANS: A

National Centre for Antarctic and Ocean Research (NCAOR) is India's premier R&D institution responsible for the country's research activities in the polar and Southern Ocean realms. It functions under the ministry of Earth Sciences. The mandate of NCAOR is multidimensional:

- Leadership role in niche areas of scientific research in the domain of polar and ocean sciences.
- Lead role in the geoscientific surveys of the country's EEZ and its extended continental shelf beyond 200M, deepsea drilling in the Arabian

Sea basin through the IODP, exploration for ocean non-living resources such as the gas hydrates and multi-metal sulphides in mid-ocean ridges.

- Facilitatory role in the scientific research activities being undertaken by several national institutions and organizations in Antarctica, the Arctic and in the Indian Ocean sector of the Southern Ocean.
- Management role in implementing all scientific and logistics activities related to the Annual Indian Expeditions to the Antarctic, Arctic and Southern Ocean.
- Management and upkeep of the Indian Antarctic Research Bases "Maitri" and "Bharati", and the Indian Arctic base "Himadri"
- Management of the Ministry's research vessel ORV Sagar Kanya as well as the other research vessels chartered by the Ministry

**QUESTION )** Consider the following statement and choose the correct one/s

- (1) Human ear converts pressure variations in air with audible frequencies into electric signals.
- (2) Sound from ear to brain is carried through Auditory Nerves.

Code:

- (A) 1 only
- (B) 2 only
- (C) Both 1 and 2
- (D) None of the above

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

ANS: C

Statement 1 is correct Human beings are able to hear with the help of an extremely sensitive device called the ear. It allows us to convert pressure variations in air with audible frequencies into electric signals.

Statement 2 is Correct The electrical signal produced by ear is carried to brain through Auditory Nerves. The outer ear is called 'pinna'. It collects the sound from the surroundings. The collected sound passes through the auditory canal. At the end of the auditory canal there is a thin membrane called the ear drum or tympanic membrane. When a compression of the medium reaches the eardrum the pressure on the outside of the membrane increases and forces the eardrum inward. Similarly, the eardrum moves outward when a rarefaction reaches it. In this way the eardrum vibrates. The vibrations are amplified several times by three bones (the hammer, anvil and stirrup) in the middle ear. The middle ear transmits the amplified pressure variations received from the sound wave to the inner ear. In the inner ear, the pressure variations are turned into electrical signals by the cochlea. These electrical signals are sent to the brain via the auditory nerve, and the brain interprets them as sound.

**QUESTION )** Read the following statements and select the correct ones.

- (1) Lipases are used in detergent formulations.
- (2) Yeast is used for commercial production of ethanol.
- (3) Statins produced by the yeast *Monascuspurpureus* have been commercialized as blood-cholesterol lowering agents.

Codes

- (A) 1 only
- (B) 1 and 2 only
- (C) 1 and 3 only
- (D) All of the above

ANS: D

All the statements are correct: Lipases are used in detergent formulations and are helpful in removing oily stains from the laundry. Yeast (*Saccharomyces cerevisiae*) is used for commercial production of ethanol. Microbes are also used for production of enzymes. Statins produced by the yeast *Monascuspurpureus* have been commercialised as blood-cholesterol lowering agents. It acts by competitively inhibiting the enzyme responsible for synthesis of cholesterol.

**QUESTION )** Consider the following about potential use of Nanotechnology

- (1) Lifesaving medical robots
- (2) Untraceable weapons of mass destruction
- (3) Networked computers for everyone in the world
- (4) Networked cameras so that government can watch our every move
- (5) Rapid invention of wondrous products
- (6) Development of weapons fast enough to destabilize any arms race.

Choose the correct code:



## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

- (A) 1, 3 and 5
- (B) 1, 2, 3 and 5
- (C) 1, 2, 3, 5 and 6
- (D) All of the above

ANS: D

What could nano-factories produce? Lifesaving medical robots or untraceable weapons of mass destruction. Networked computers for everyone in the world or networked cameras so governments can watch our every move. Trillions of dollars of abundance or a vicious scramble to own everything. Rapid invention of wondrous products or weapons development fast enough to destabilize any arms race. (Hence all statements are correct).

**QUESTION )** Consider the following statements with regard to Genetic Engineering appraisal Committee (GEAC)?

- (1) This committee operates under the Department of Biotechnology.
- (2) The committee has the powers to take punitive actions.

Select the correct answer using the codes given below:

- (A) 1 only
- (B) 2 only
- (C) Both 1 and 2
- (D) Neither 1 and 2

ANS: B

Statement 1 is incorrect: The Genetic Engineering Appraisal Committee (GEAC) functions under the Ministry of Environment, Forest and Climate Change. As per Rules, 1989, it is responsible for appraisal of activities involving large scale use of hazardous microorganisms and recombinants in research and industrial production from the environmental angle. The committee is also responsible for appraisal of proposals relating to release of genetically engineered (GE) organisms and products into the environment including experimental field trials. Statement 2 is correct: The functions of GEAC as prescribed in the Rules 1989 are as follows:

- I. To appraise activities involving large scale use of hazardous microorganisms and recombinants in research and industrial production from the environmental angle.
- II. To appraise proposals relating to release of genetically engineered organisms and products into the environment including experimental field trials
- III. The committee or any of the persons authorized by it has powers to take punitive action under Environment Protection Act.

**QUESTION )** Electrically charged particles from space travelling at speeds of several hundred km/sec can severely harm living beings if they reach the surface of the earth.

What prevents them from reaching the surface of the earth?

- (A) Ozone layer around the earth reflects them back to outer space.
- (B) The earth's magnetic field diverts them towards its pole.

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(C) Moisture in the upper layers of atmosphere prevents them from reaching the surface of the earth.

(D) None of the above

ANS: B

Earth dipolar magnetic field deflects charged particles, and diverts the solar winds, electrons and protons towards the poles leads to formation of aurora australis on southern and aurora borealis on northern hemisphere of the earth. Charged particles emitted by the sun flow towards the earth and beyond, in a stream called the solar wind. Their motion is affected by the earth's magnetic field, and in turn, they affect the pattern of the earth's magnetic field. The pattern of magnetic field near the poles is quite different from that in other regions of the earth.

**QUESTION )** Consider the following statements about Internet of things (IOT):

- (1) It will help in achieving the objective of smart city projects.
- (2) It will ensure privacy by securing personnel data.
- (3) It will lower labor costs because ranchers can identify where their cattle are located.
- (4) Determining custom fertilizer profiles based on soil chemistry.

Which of the statements given above is/are benefits of IOT?

- (A) 1 and 2 only  
(B) 1, 3 and 4 only

(C) 1 and 3 only

(D) All of the above

ANS: B

Statement 1 is correct: Internet of Things will provide technological support to smart cities – think of connected traffic signals that monitor utility use, or smart bins that signal when they need to be emptied. Statement 2 is incorrect: Everything new and shiny has downsides, and security and privacy are the biggest challenges for IoT. All these devices and systems collect a lot of personal data about people – that smart meter knows when you're home and what electronics you use when you're there – and it's shared with other devices and held in databases by companies. Monitoring plant and soil conditions is a simple use case—but it can lead to a fantastic return on investment for farmers. We've seen several great uses for agriculture IoT in this space:

- (1) Sensing for soil moisture and nutrients.
- (2) Controlling water usage for optimal plant growth.
- (3) Determining custom fertilizer profiles based on soil chemistry.(statement 4 is correct)
- (4) Determining the optimal time to plant and harvest.
- (5) Reporting weather conditions. IoT application in livestock: It gathers data regarding the health, well-being, and location of their cattle.This information saves them money in two ways:
  - (1) It helps identify sick animals so they can be pulled from the herd, preventing the spread of disease.



## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(2) It lowers labor costs because ranchers can identify where their cattle are located (statement 3 is correct)

**QUESTION )** Consider the following statements regarding Physiological Effects of Auxins on plants.

- (1) They control xylem differentiation and helps in cell division.
- (2) They induce parthenocarpy, in tomatoes and are widely used as herbicides.
- (3) Auxins Prevent flowering and also helps to prevent fruit and leaf drop at early stages.

Choose the correct answer using the codes given below:

- (A) 1 and 2 only
- (B) 2 and 3 only
- (C) 1 and 3 only
- (D) All of the above

ANS: A

Statement 1 and 2 are correct as Auxins also induce parthenocarpy, e.g., in tomatoes. They are widely used as herbicides. 2, 4-D, widely used to kill dicotyledonous weeds, does not affect mature monocotyledonous plants. It is used to prepare weed-free lawns by gardeners. Auxin also controls xylem differentiation and helps in cell division. Statement 3 is incorrect as Auxins help to initiate rooting in stem cuttings, an application widely used for plant propagation. Auxins promote flowering e.g. in pineapples. They

help to prevent fruit and leaf drop at early stages but promote the abscission of older mature leaves and fruits.

Auxins (from Greek 'Auxein': to grow) was first isolated from human urine. The term 'auxin' is applied to the indole-3-acetic acid (IAA), and to other natural and synthetic compounds having certain growth regulating properties. They are generally produced by the growing apices of the stems and roots, from where they migrate to the regions of their action. Auxins like IAA and indole butyric acid (IBA) have been isolated from plants. NAA (naphthalene acetic acid) and 2, 4-D (2, 4-dichlorophenoxyacetic) are synthetic auxins. All these auxins have been used extensively in agricultural and horticultural practices.

**QUESTION )** Which of the given Departments come under Ministry of Science & Technology?

- (1) Department of Biotechnology
- (2) Department of Atomic Energy
- (3) Department of Scientific and Industrial Research
- (4) Department of Space
- (5) Department of Earth Sciences

Select the correct answer using the codes given below:

- (A) 1 and 3 only
- (B) 1, 3 and 5 only
- (C) 2, 4 and 5 only

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(D) All of the above

ANS: A

Departments under Ministry of Science and Technology:

- Department of Biotechnology (DBT), Government of India (Hence 1 is correct)
- Department of Science and Technology (DST)
- Department of Scientific and Industrial Research (DSIR) (Hence 3 is correct) Prime Minister's office is in-charge of: Ministry of Personnel, Public Grievances and Pensions; Department of Atomic Energy; (Hence 2 is incorrect) Department of Space; and (Hence 4 is incorrect) All important policy issues; All other portfolios not allocated to any Minister. Department of earth sciences comes under Ministry of Earth Science (Hence 5 is incorrect)

**QUESTION )** Which of the following organisms help in converting dead organic matter into simple soluble minerals and gases?

- (1) Bacteria
- (2) Protozoa
- (3) Fungi

Choose the correct answer from the codes given below:

- (A) 1 only
- (B) 1 and 3 only
- (C) 1, 2 and 3

(D) None of the above

ANS: C Explanation: Together with bacteria, fungi and Protozoa also convert dead organic matter into simple soluble minerals and gases, which can be used again by plants.

**QUESTION )** With reference to the 'Ramayan Cruise Tour', consider the following statements:

- (1) It will be the first-ever luxury Cruise service on the Saryu river (Ghagra/National Waterways-40) in Ayodhya, Uttar Pradesh.
- (2) It aims to give mesmerizing experience to devotees with one-of-its-kind spiritual journeys while cruising through the famous ghats of the holy river Saryu.

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

Answer: C

Union Minister of Ports, Shipping and Waterways announced that

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

‘Ramayan Cruise Tour’ on the Saryu river in Ayodhya will be launched soon.

It will be the first-ever luxury Cruise service on the Saryu river (Ghagra/National Waterways-40) in Ayodhya, Uttar Pradesh.

It aims to give mesmerizing experience to devotees with one-of-its-kind spiritual journeys while cruising through the famous ghats of the holy river Saryu.

Tourists will be taken on the ‘Ramcharitmanas Tour’, of 1-1.5 hour duration, featuring an exclusively made video film of 45-60 minutes duration, based on Ramcharitmanas by Goswami Tulsidas, covering the period from the birth of Lord Ram to his Rajyabhishek.

Ayodhya is the birthplace of Lord Ram, as mentioned in in the great Indian epic Ramayan. It is also the first of the seven most important pilgrimage sites (Mokshdayini Sapt Puris) for the Hindus.

Hence both statements are correct.

**QUESTION )** Recently, which of the following cities set up a “child-friendly” police station in accordance with the guidelines laid down by the National Commissioner for Protection of Child Rights (NCPCR)?

- (A) Indore
- (B) Pune
- (C) Ahmedabad

(D) Jaipur

Answer: B

A “child-friendly” police station set up in accordance with the guidelines laid down by the National Commissioner for Protection of Child Rights (NCPCR) was launched in Pune. Hence option (B) is correct.

Pune police have worked with Hope for Children Foundation to set up this. Child-friendly police station is an innovative concept in the direction of preventing juvenile crimes and children reforms. This police station will work towards character building among children and will also work in changing the notion that police are not enemies but friends of people. The child friendly police station houses books and toys and will also work towards character building among children.

**QUESTION )** With respect to “Honey Mission”, consider the following statements:

- (1) It is launched by Khadi and Village Industries Commission (KVIC).
- (2) It provides training and 10 bee boxes with live colonies to beneficiaries including farmers, beekeepers and unemployed youth.

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

## EKLAVYA 360° PRELIMS PROGRAM – TEST 12 Explanation

Answer: C

Responding to the Prime Minister's call for Aatmanirbhar Bharat, Khadi and Village Industries Commission (KVIC) engaged hundreds of migrant workers in Uttar Pradesh and Bihar and engaged them with its flagship scheme like Honey Mission.

The distressed migrant workers who were engaged with KVIC's Honey Mission in Uttar Pradesh in the month of August, have reaped their first honey harvest and are awaiting a bumper yield in the months from December to March.

Hence Statement 1 is correct: The Honey Mission launched by KVIC 3 years ago aims at creating employment for farmers, Adivasis, women and unemployed youth by roping them with beekeeping and increasing India's honey production.

Hence Statement 2 is correct: Under the Honey Mission, KVIC provides training and 10 bee boxes with live colonies to beneficiaries including farmers, beekeepers and unemployed youth. KVIC also runs beekeeping training programmes and courses.

**QUESTION )** With respect to "Indian peacock softshell turtle", consider the following statements:

(1) It is a species of turtle found in only in North East.

(2) It is listed on the IUCN Red list as endangered species.

Which of the above given statements is/are correct?

(A) 1 only

(B) 2 only

(C) Both 1 and 2

(D) Neither 1 nor 2

Answer: D

Indian peacock softshell turtle, a turtle of a vulnerable species was rescued from a fish market in Assam's Silchar.

Statement 1 is incorrect: The Indian peacock softshell turtle [Nilssonina hurum] is a species of turtle found in South Asia.

Statement 2 is incorrect: it is listed on the IUCN Red list as vulnerable species. It is a schedule I species in the Indian Wildlife Protection Act, 1972, and is accorded the highest protection.

According to a report by Guwahati-based conservation NGO, Help Earth, 29 species of turtles have been recorded in India, out of which 20 are found in Assam.

**QUESTION )** According to "The Ericsson Mobility Report 2020", which of the following countries has the highest average monthly mobile data traffic per smart phone and which is expected to surpass 350 million 5G subscriptions by 2026?

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

- (A) USA
- (B) India
- (C) China
- (D) Brazil

Answer: B

India, which has the highest average monthly mobile data traffic per smartphone, is expected to surpass 350 million 5G subscriptions by 2026, accounting for 27% of all mobile subscriptions in the country, according to a report by Swedish telecom equipment maker Ericsson. Hence option (B) is correct.

As per the 'The Ericsson Mobility Report 2020,' four out of every ten mobile subscriptions in 2026 will be 5G globally with 5G subscriptions forecast to reach 3.5 billion. In the India region, LTE (long-term evolution technology) subscriptions are forecast to increase from 710 million in 2020 to 820 million in 2026" by which time 3G will be phased out.

**QUESTION )** Which of the following best describes "Operation Trident"?

- (A) Against 2008 Mumbai terror attacks.
- (B) India's Military capture of majority of Siachen glacier.
- (C) Operation for Liberation of Goa .
- (D) Operation on Pakistan's port of Karachi during the 1971 India-Pakistan War.

Answer: D

Every year, India celebrates December 4 as Navy Day to commemorate Operation Trident – a key offensive during the 1971 India-Pakistan War, when the Indian Navy inflicted heavy damage on Pakistani vessels in Karachi harbour. Hence option (D) is correct.

The India-Pakistan War of 1971 had begun on December 3, when the Pakistan Air Force launched pre-emptive strikes on airfields in Western India. India responded by formally declaring war in the wee hours of December 4. On December 4, under Operation Trident, the Indian Navy sank three vessels near the Pakistani port city of Karachi. The stars of the mission were the then-recently acquired Soviet Osa missile boats, fitted with 4 SS-N-2 (P-15) Styx missiles. The Indian Air Force also played a crucial role during Operation Trident, when Karachi's Kemari oil tanks were strafed by the IAF on the same day in an independent operation which it did not claim.

**QUESTION )** With respect to "IIT Bombay-urban quality of life index", consider the following statements:

- (1) The gap in literacy rate between men and women is the widest in Patna (13.2%) and lowest in Jaipur (5.4%).
- (2) Chennai is the most women- friendly city and Patna is the least.

Which of the above given statements is/are correct?

- (A) 1 only
- (B) 2 only
- (C) Both 1 and 2
- (D) Neither 1 nor 2

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

Answer: B

IIT-Bombay researchers have come up with an urban quality of life index tailored to the reality of life in India.

Overall, Mumbai tops the list of 14, followed closely by Delhi, Kolkata and Chennai.

Statement 2 is correct: For the first time, they have factored in gender parity. Chennai, it turns out, is the most women- friendly and Patna the least.

“Women experience cities differently; meeting women’s needs becomes essential in promoting sustainable urban development,” the paper, in press to be published in Elsevier journal ‘Transport Policy’, said. The study found that Jaipur has the highest crime rate against women, Chennai has the lowest .

Hence Statement 1 is incorrect: The gap in literacy rate between men and women is the widest in Jaipur (13.2%) and lowest in Kolkata ((5.4%). Literacy was the highest in Pune (91%) and, surprisingly, the lowest in Hyderabad (83%).

The unemployment rate for women is the highest in Patna — at 346, it is more than four times the urban average of 7.3. Another often overlooked factor are the basics — power, water, education. Only 36% urban households in Patna have access to treated tap water. -----Update

**Facts(During exam)**

**QUESTION )** With reference to the 2nd Cancer Genome Atlas, 2020, consider the following statements:

(1) TCGA is a landmark cancer genomics program that molecularly characterized over 20,000 primary cancer and matched normal samples spanning 33 cancer types.

(2) This joint effort between the France- National Cancer Institute and the National Human Genome Research Institute began in 2006.

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

Answer: A

Explanation :

The Minister of Science and Technology and Vice President of Council for Scientific and Industrial Research (CSIR), Dr Harsh Vardhan virtually inaugurated the 2nd TCGA 2020 conference in New Delhi.

TCGA is a landmark cancer genomics program that molecularly characterized over 20,000 primary cancer and matched normal samples spanning 33 cancer types.

This joint effort between the US- National Cancer Institute and the National Human Genome Research Institute began in 2006, bringing together researchers from diverse disciplines and multiple institutions.



## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

Over the years, TCGA generated over 2.5 petabytes of genomic, epigenomic, transcriptomic, and proteomic data. The data, which has already led to improvements in the ability to diagnose, treat, and prevent cancer, will remain publicly available for anyone in the research community to use.

On similar lines, the establishment of an 'Indian Cancer Genomics Atlas (ICGA)' has been initiated by a consortium of key stakeholders in India led by CSIR, Government of India.

Hence only statement 1 is correct.

**QUESTION )** With reference to the Smuggling in India Report 2019-20, consider the following statements:

- (1) The report has been compiled by the Directorate of Revenue Intelligence (DRI).
- (2) DRI Utkrisht Seva Samman, 2020 was awarded to B. Sankaran.

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

Answer: C

Union Finance Minister released the Smuggling in India Report 2019-20 which analyses organised smuggling trends on Gold and Foreign Currency, Narcotic Drugs, Security, Environment and Commercial Frauds.

The report has been compiled by the Directorate of Revenue Intelligence (DRI).

**QUESTION )** With reference to the AMBA application and enrolment report 2020, consider the following statements:

- (1) India added more women students to its business schools in the last two years, but it was nowhere near enough to escape the tag of worst gender ratio in management classrooms
- (2) China topped the charts as the only region to report an equal proportion of men and women in their management programmes.

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

Answer: C

**QUESTION )** With reference to the Atmanirbhar Bharat RojgarYojana (ABRY), consider the following statements:

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(1) It aims to boost employment in formal sector and incentivize creation of new employment opportunities during the Covid recovery phase under Atmanirbhar Bharat Package 3.0.

(2) Government of India will pay both 20% employees' contribution and 20% employers' contribution towards Employees' Provident Fund (EPF) in respect of new employees in establishments employing upto 1000 employees for two years.

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

Answer: A

The Union Cabinet has given its approval for Atmanirbhar Bharat RojgarYojana (ABRY) to boost employment in formal sector and incentivize creation of new employment opportunities during the Covid recovery phase under Atmanirbhar Bharat Package 3.0.

Government of India will provide subsidy for two years in respect of new employees engaged on or after 1st October, 2020 and upto 30th June, 2021.

Government of India will pay both 12% employees' contribution and 12% employers' contribution i.e. 24% of wages towards Employees' Provident Fund (EPF) in respect of new employees in establishments employing upto 1000 employees for two years.

Government of India will pay only employees' share of EPF contribution i.e. 12% of wages in respect of new employees in establishments employing more than 1000 employee for two years.

An employee drawing monthly wage of less than Rs. 15000/- who was not working in any establishment registered with the Employees' Provident Fund Organisation (EPFO) before 1st October, 2020 and did not have a Universal Account Number or EPF Member account number prior to 1stOctober 2020 will be eligible for the benefit.

**QUESTION )** With reference to the Real Time Gross Settlement System (RTGS), consider the following statements:

- (1) It was not available for round the clock transactions from December 14.
- (2) RTGS uses ISO 20022 format which is the best-in-class messaging standard for financial transactions.

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

Answer: B

Just within a year of operationalising NEFT 24x7, the Reserve Bank has announced that the Real Time Gross Settlement System or the RTGS facility is now available for round the clock transactions, with effect from December 14.

## EKLAVYA 360° PRELIMS PROGRAM – TEST 12 Explanation

Round the clock availability of RTGS will provide extended flexibility to businesses for effecting payments. The system can also be leveraged to enhance operations of Indian financial markets and cross-border payments.

RTGS, which began its operations on 26th March, 2004 with a soft launch involving four banks, presently handles 6.35 lakh transactions daily for a value of 4.17 lakh crore rupees across 237 participant banks.

RBI has informed that RTGS uses ISO 20022 format which is the best-in-class messaging standard for financial transactions.

The term real-time gross settlement (RTGS) refers to a funds transfer system that allows for the instantaneous transfer of money and/or securities.

RTGS is the continuous process of settling payments on an individual order basis without netting debits with credits across the books of a central bank.

Once completed, real-time gross settlement payments are final and irrevocable

Hence only statement 2 is correct.

**QUESTION )** With reference to the UNESCO award for creative economy, consider the following statements:

(1) The UNESCO has decided to launch an international prize in the field of 'creative economy' in the name of Bangabandhu Sheikh Mujibur Rahman.

(2) UNESCO has declared 2020 as 'International Year of Creative Economy for Sustainable Development'.

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

Answer: A

The UNESCO has decided to launch an international prize in the field of 'creative economy' in the name of Bangabandhu Sheikh Mujibur Rahman.

Starting November 2021, the dollar 50 thousand award will be given away once in two years for global economic initiatives of the youth.

The award will recognise exceptional initiatives taken by cultural workers and organizations in the development of the creative economy.

Currently, there are 23 UNESCO International Awards in the name of international celebrities and organisations.

UNESCO has declared 2021 as 'International Year of Creative Economy for Sustainable Development'.

**QUESTION )** With reference to the International Financial Services Centres Authority (Bullion Exchange) Regulations, 2020, consider the following statements:

(1) In the Union Budget 2020, Union Minister of Finance had made an announcement for setting up an International Bullion Exchange at the International Financial Services Centre in GIFT City, Gandhinagar, Gujarat.

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(2) IFSCA has been entrusted with the responsibility of operationalization of this Exchange.

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

Answer: C

IFSCA has notified International Financial Services Centres Authority (Bullion Exchange) Regulations, 2020.

In the Union Budget 2020, Union Minister of Finance had made an announcement for setting up an International Bullion Exchange at the International Financial Services Centre in GIFT City, Gandhinagar, Gujarat.

Subsequently, the Government of India had notified the bullion spot delivery contract and bullion depository receipt (with bullion as underlying) as Financial Products and related services as Financial Services under the International Financial Services Centres Authority (IFSCA) Act, 2019.

IFSCA has been entrusted with the responsibility of operationalization of this Exchange.

In this regard, International Financial Services Centres Authority (Bullion Exchange) Regulations 2020 were approved by the Authority in its meeting held on October 27, 2020. The said regulations have been notified and published in the Gazette of India on December 11, 2020.

The regulations inter alia cover the Bullion Exchange, Clearing Corporation, Depository and Vaults.

The regulations are divided into the 16 chapters. First half of the regulation deals with the Exchange and Clearing Corporations while the second half pertains to the Vaults and Depositories and related provisions.

Hence both statements are correct.

**QUESTION )** With reference to the Green Building, consider the following statements:

(1) According to World Green Building Council data buildings and construction account for 39% of energy-related CO<sub>2</sub> emissions in the world

(2) GRIHA Council has developed the Building Fitness Indicator (BFI) tool - a free-to-use self-assessment tool that allows organizations to measure the preparedness of workplaces to prevent exposure to COVID-19.

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

Answer: C

The Vice President of India, Shri M. Venkaiah Naidu, virtually inaugurating the 12th GRIHA (Green Rating for Integrated Habitat Assessment) Summit, organised by the GRIHA Council from Hyderabad.

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

Quoting the World Green Building Council data, the Vice President said that buildings and construction account for 39% of energy-related CO<sub>2</sub> emissions in the world and called for accelerating the process of total de-carbonization of the built environment.

Opining that the roof cooling should be an area of priority for all, he mentioned that in India, over 60 percent of roofs are made from metal, asbestos, and concrete - thus trapping heat inside buildings and contributing to heat island effect in urban areas. cool roofs can lower indoor temperatures by 2 to 4 degrees Celsius as compared to traditional roofs.

Observing that the implementation of Bureau of Energy Efficiency's Energy Conservation Building Code (ECBC) has not been uniform across the nation, Shri Naidu appreciated the states of Telangana and Andhra Pradesh for taking a lead in this regard.

GRIHA Council has developed the Building Fitness Indicator (BFI) tool - a free-to-use self-assessment tool that allows organizations to measure the preparedness of workplaces to prevent exposure to COVID-19.

Hence both statements are correct.

**QUESTION )** With reference to the National AYUSH Mission (NAM), consider the following statements:

- (1) It is a central sector scheme.
- (2) Under National AYUSH Mission (NAM), the Ministry of AYUSH has approved 200 AYUSH Health & Wellness Centres (HWC) in Uttarakhand.

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

Answer: B

Under Centrally Sponsored Scheme of National AYUSH Mission (NAM), the Ministry of AYUSH has approved 200 AYUSH Health & Wellness Centres (HWC) in Uttarakhand.

In this regard, Arvind Lal Vandana Lal (ALVL) Foundation, New Delhi is providing support to the Department of AYUSH, Uttarakhand, in operationalization of AYUSH HWCs in Almora District of Uttarakhand.

In the operational guideline of AYUSH Health and Wellness Centers, there is a provision for partnership with Government and Non-Governmental organizations for improving the environment for health in providing Comprehensive Primary Health Care.

The Central Government has decided to operationalise 12,500 AYUSH Health and Wellness Centres in phased manner by the year 2023-2024 throughout the country.

Hence only statement 2 is correct.

**QUESTION )** IT Revolution which is widespread in India is not free from cyber threats. Which of the following is/are true about cyber threats?



## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(1) Spyware is a software which gathers information from a organisation and send this to another entity without the consumer's consent.

(2) Unlike computer viruses and worms, Trojans generally do not attempt to inject themselves into other files or otherwise propagate themselves.

(3) In India CERT-In is the nodal agency to deal with cyber attacks and facilitate exchange of domestic Internet traffic between the peering ISP members.

Select the correct answer using the codes given below:

- (A) Only 1
- (B) 1 and 2
- (C) 1 and 3
- (D) All

Answer: (B)

In India CERT-In is the nodal agency to deal with cyber attacks whereas NIXI (National Internet Exchange of India) facilitate exchange of domestic Internet traffic between the peering ISP members.

In computing, Trojan horse, or Trojan, is any malicious computer program which is used to hack into a computer by misleading users of its true intent.

**QUESTION )** Consider the following statements about Nanogenerator:

(1) It is a small electronic chip that can use mechanical movements of the body to generate electricity.

(2) It uses Piezoelectric materials thus does not need any integrated circuit.

(1)Which of the above statements is/are correct?

- (A) Only 1
- (B) Only 2
- (C) Both
- (D) None

Answer: (A)

Nanogenerator is the term used to describe a small electronic chip that can use mechanical movements of the body, such as a gentle finger pinch, to generate electricity.

The chip has an integrated circuit etched onto a flexible surface, similar to components on the circuit boards inside your computer.

The key components inside a nanogenerator are nanowires or a similar structure made from a piezoelectric ceramic material.

Piezoelectric materials can generate an electric current just by being bent or stressed.

**QUESTION )** Which of the following statement correctly defines the term Astrobiology?



## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(A) Astrobiology is the study of the origin, evolution and distribution of life in the universe.

(B) Astrobiology is the study of the origin, evolution and distribution of life on Earth.

(C) Astrobiology is the study of the Universe and its relationship with Predictions of Future of Mankind.

(D) Astrobiology is the study of Astronomical Observations which affect evolution of Man on Earth.

Answer: (A)

India's first Astrobiology Conference - Life in Space- was organised in the city by Mumbai-based Indian Astrobiology Research Centre and IARC Centre for United Nations in collaboration with Nehru Science Centre.

Astrobiology is the study of the origin, evolution and distribution of life in the universe. It also refers to the search for any kind of life elsewhere, as well as the search for extraterrestrial intelligence

**QUESTION )** With reference to the Lithium-ion batteries which of the following statements is/are correct?

(1) It has high power efficiency and less space usage over nickel-cadmium battery and is used in mobile device cell-phones.

(2) Because of their light weight, Li-ion batteries are used for propelling a wide range of electric vehicles such as aircraft and electric cars.

(1) Select the correct answer using below given options:

(A) Only 1

(B) Only 2

(C) Both

(D) None

Answer: (C)

Lithium-ion batteries power everything from mobile devices-cell phones, sensors in medical devices, laptops, automobiles, defence equipment and aircrafts.

Li-ion batteries provide lightweight, high energy density power sources for a variety of devices. To power larger devices, such as electric cars, connecting many small batteries in a parallel circuit is more effective and more efficient than connecting a single

- **Portable devices:** these include mobile phones and smartphones, laptops and tablets, digital cameras and camcorders, electronic cigarettes, handheld game consoles and torches (flashlights).
- **Power tools:** Li-ion batteries are used in tools such as cordless drills, sanders, saws and a variety of garden equipment including whipper-snippers and hedge trimmers.
- **Electric vehicles:** Because of their light weight Li-ion batteries are used for propelling a wide range of electric vehicles such as aircraft, electric cars, Pedelecs, hybrid vehicles, advanced electric wheelchairs, radio-controlled models, model aircraft and the Mars Curiosity rover.

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

**QUESTION )** An aerosol is a colloid of fine solid particles or liquid droplets, in air or another gas. Which of the following is/are the examples of aerogels?

- (1) Fog
- (2) Haze
- (3) Tear gas
- (4) Insecticide

Select the correct answer using the codes given below:

- (A) Only 1
- (B) 1 and 2
- (C) None
- (D) All

Answer: (D)

Aerosol is a colloidal dispersion of solid or liquid particles in a gas; smoke or fog, paint, polish, or insecticide, dispensed from a small metal container by a propellant under pressure.

Tear gas is not a gas, but an aerosol. CS is solid at room temperature and mixed with liquid or gas dispersal agents when used as a weapon designed to activate pain-sensing nerves.

**QUESTION )** Which of the following statements related to the different types of Navy vessels is/are correct?

(1) A ballistic missile submarine can launch submarine-launched ballistic missiles (SLBMs) with nuclear warheads.

(2) A destroyer is a fast and maneuverable yet long-endurance warship intended to escort larger vessels in a fleet, convoy or battle group and defend them against smaller, powerful, short-range attackers.

Select the correct answer using the codes given below:

- (A) Only 1
- (B) Only 2
- (C) Both
- (D) None

Answer: (C)

A ballistic missile submarine is a submarine equipped to launch submarine-launched ballistic missiles (SLBMs) with nuclear warheads. Attack Submarines or hunter-killer submarine is a submarine specifically designed for the purpose of attacking and sinking other submarines, surface combatants and merchant vessels. They are also used to protect friendly surface combatants and missile submarines.

A destroyer is a fast and maneuverable yet long-endurance warship intended to escort larger vessels in a fleet, convoy or battle group and defend them against smaller, powerful, short-range attackers.

Frigate is a warship with a mixed armament, generally lighter than a destroyer (in the US navy, heavier) and of a kind originally introduced for convoy escort work. They are armed with guided missiles and used as an

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

escort for aircraft carrier. It is also used for shore bombardment and other combat functions.

**QUESTION )** Which of the following are the applications of Human Genome Project?

- (1) Identification of human genes and their functions.
- (2) Understanding polygenic disorders. (3) Improvements in gene therapy.
- (4) Improved diagnosis of diseases.
- (5) Understanding complex social traits. 6. Genetic basis of psychiatric disorders.

Select the correct answer using the codes given below:

- (A) 1, 2, 3, 4 and 6  
(B) 1, 2, 3 and 6  
(C) 2, 3, 4, 5 and 6  
(D) All

Answer: (D)

Applications are:

- Identification of human genes and their functions.
- Understanding polygenic disorders.
- Improvements in gene therapy.
- Improved diagnosis of diseases.

- Understanding complex social traits.
- Genetic basis of psychiatric disorders.
- Development of pharmacogenesis.
- Better understanding of developmental biology.
- Improved knowledge on mutations.

**QUESTION )** Which of the following statements is/are true about Artificial Intelligence?

- i) It includes those machines which mimics the cognitive functions which are associated with a usual human mind.
- ii) A computer program with AI can answer the generic questions it is meant to solve.
- iii) AI programs can absorb new modifications by putting highly independent pieces of information together.

Select the correct answer using the codes given below:

- (A) 1 and 3  
(B) 2 and 3  
(C) None  
(D) All

Answer: (D)

Artificial intelligence enables the machines to think like a human being and then take actions. Artificial Intelligence is a way of making a computer, a

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

computer-controlled robot, or a software think intelligently, in the similar manner the intelligent humans think.

AI is accomplished by studying how human brain thinks, and how humans learn, decide, and work while trying to solve a problem, and then using the outcomes of this study as a basis of developing intelligent software and systems.

Programming With AI:

- A computer program with AI can answer the generic questions it is meant to solve.
- AI programs can absorb new modifications by putting highly independent pieces of information together. Hence you can modify even a minute piece of information of program without affecting its structure.
- Quick and Easy program modification

**QUESTION )** Which of the following statements is/are true about Unmanned Aerial Vehicles?

- (1) These are remote controlled aircrafts having pre-programmed flight plans.
- (2) UAVs can be used for aerial crop survey, detection of illegal hunting and product delivery.
- (3) Operation of UAVs in India is controlled by the guidelines issued by Department of Internal Security, Ministry of Home Affairs.

Codes:

- (A) Only 1

(B) 1 and 2

(C) Only 3

(D) All

Answer: (B)

Exp: Operation of UAVs in India is controlled by the guidelines issued by Directorate General of Civil Aviation

**QUESTION )** Which of the following statements is/are true about Carbon Nanotubes?

- (1) These are hollow cylindrical fibres comprising of a single sheet of pure graphite.
- (2) As compared to other carbon fibres these have low mechanical strength.
- (3) When CNTs are dispersed homogeneously in a metal matrix, it increases its corrosive resistance.

Select the correct answer using the codes given below:

(A) 1 and 2

(B) 1 and 3

(C) Only 1

(D) All

Answer: (B)

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

These are in nano size, so they added to the exceptional mechanical strength to the matrix.

**QUESTION )** Which of the following biotechnology terminologies is/are correct?

- (1) A cisgene is a natural gene from the crop plant itself or from a sexually compatible donor plant that can be used in conventional breeding.
- (2) Transgene is a gene from a non-crossable species which represents a new gene pool for plant breeding.
- (3) Cytogenetics is the study of the structure, function and abnormalities of human chromosomes.

Select the correct answer using the codes given below:

- (A) Only 2
- (B) 1 and 2
- (C) None
- (D) All

Answer: (D)

A cisgene is a natural gene, coding for an (agricultural) trait, from the crop plant itself or from a sexually compatible donor plant that can be used in conventional breeding. The gene belongs to the conventional breeder's gene pool. A transgene is a gene from a non-crossable species or it is a synthetic gene. It represents a new gene pool for plant breeding.

Cytogenetics is the study of the structure, function and abnormalities of human chromosomes.

**QUESTION )** Which of the following statements is/are correct regarding TeamIndus?

- (1) TeamIndus will be India's 2nd moon mission after Chandrayan with funding from private sector also.
- (2) It will be launched onboard of ISRO's workhorse Geo synchronous Satellite Launch Vehicle (GSLV).

Codes:

- (A) Only 1
- (B) ONLY 2
- (C) Both
- (D) None

Answer: (D)

TeamIndus is the only Indian team competing for the Google Lunar XPRIZE. The \$30M Google Lunar XPRIZE is a global competition to challenge and inspire engineers and entrepreneurs to develop low-cost methods of robotic space exploration. To win, a privately funded team must successfully place a robot on the Moon that explores at least 500 meters and transmits high-definition video and images back to Earth.

**QUESTION )** Which of the following statement related to conventional warhead is correct?



## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(A) It is an explosive warhead which is laden with high explosive materials that undergo rapid nuclear reaction.

(B) It relies on the detonation of the explosive and metal casing fragmentation as killing mechanism.

(C) These are heavy (several tonnes) warheads that are automatically triggered.

(D) None of the above

Answer: (B)

Conventional warhead is laden with high explosive materials and undergo rapid chemical reaction, accompanied by release of energy. Most widely used and usual warhead in missiles. Employed when a swift and precise destruction of target is required

**QUESTION )** Fertile material although not itself fissionable but can be converted into a fissile material by neutron absorption and subsequent nuclei conversions. Which of the following are the natural occurring fertile materials?

(1) Thorium - 232

(2) Uranium - 234

(3) Uranium - 238

(4) Plutonium - 238

Codes:

(A) 1, 2 and 3

(B) 2, 3 and 4

(C) 2 and 4

(D) All

Answer: a)

Naturally occurring fertile materials that can be converted into a fissile material by irradiation in a reactor include:

- Thorium-232 which converts into uranium- 233.

- \* Uranium- 234 converts to Uranium – 235.

- Uranium-238 which converts into plutonium-239.

Artificial isotopes formed in the reactor which can be converted into fissile material by one neutron capture include:

- Plutonium-238 which converts into plutonium-239.

- Plutonium-240 which converts into plutonium-241

**QUESTION )** Which of the following statement correctly defines the term "grey goo" in the nanotechnology?

(A) It is a scenario in which out-of-control self-replicating robots will consume all biomass on Earth while building more of them.

(B) It is a process of increasing the safety of cars by improving the adhesion of tyres to the road.

(C) It is a process of improving the food security of the world by use of nanomaterials.



## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(D) None of the Above.

Answer: (A)

Grey goo is a hypothetical end-of-the-world scenario involving molecular nanotechnology in which out-of-control self-replicating robots consume all biomass on Earth while building more of themselves, a scenario that has been called ecophagy ("eating the environment", more literally "eating the habitation"). The original idea assumed machines were designed to have this capability, while popularizations have assumed that machines might somehow gain this capability by accident

**QUESTION )** GM Crops are the important contribution to biotechnology. Which of the following statements is/are true about GM Crops?

(1) Both Bt Cotton and Bt Brinjal are known to contain gene derived from *Bacillus thuringiensis* bacteria however its effect differ.

(2) In India Department of Science & Technology is responsible for approving the introduction of GM crops.

Codes:

(A) Only 1

(B) Only 2

(C) Both

(D) None

Answer: D

In India, Ministry of Environment through its Department of Genetic Engineering Appraisal Committee gives the concerned approval

**QUESTION )** With reference to the Omega fatty acids, consider the following statements:

(1) Both Omega-3 and Omega-6 are classes of polyunsaturated fatty acids.

(2) The major sources of Omega-3 are plant oils and marine oils.

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

Answer: (C)

Statement 1 is correct: The two major classes of polyunsaturated fatty acids (PUFAs) are the omega-3 and omega-6 fatty acids. Like all fatty acids, PUFAs consist of long chains of carbon atoms with a carboxyl group at one end of the chain and a methyl group at the other. Statement 2 is correct: The three types of omega-3 fatty acids involved in human physiology are  $\alpha$ -linolenic acid (ALA), found in plant oils, and eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), both commonly found in marine oils. Marine algae and phytoplankton are primary sources of omega-3 fatty acids. Common sources of plant oils containing ALA include walnut, edible seeds, flaxseed oil, hemp oil, while sources of animal omega-3 fatty acids EPA and DHA include fish, fish oils, eggs from chickens and certain algae.

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

There is a strong evidence of correlation between intake of omega fatty acids and reduced risks of cancer, cardiovascular diseases and others.

**QUESTION )** With reference to the Nanomaterials, consider the following statements:

- (1) Nanoparticles are the particles, having at least one dimension in the nano scale.
- (2) Generally, biodegradable and inorganic nanomaterials are employed for the purpose of targeted drug delivery.

Which of the statements given above is/are correct?

- (A) 1 only
- (B) 2 only
- (C) Both 1 and 2
- (D) Neither 1 nor 2

Answer: (A)

Statement 1 is correct: Nanomaterials contain particles in the size scale range of 1 to 100 nm in at least in one dimension. A nanometer is a unit of spatial measurement that is  $10^{-9}$  meter, or one billionth of a meter. Statement 2 is not correct: The Nanomaterials can be categorized on the basis of their degradability. The basic difference between biodegradable and non-biodegradable is that biodegradable items decompose or break down naturally whereas non-biodegradable items do not. Similarly, Nanomaterials may be organic or inorganic in nature. Biodegradable nanoparticles have been used frequently as drug delivery vehicles due to

its improved bioavailability, better encapsulation, control release and reduction of toxic potential. Examples of biodegradable nanoparticles are PEG, albumin, PLA, PLGA, chitosan, gelatin, polycaprolactone, poly-alkyl-cyanoacrylates, etc. Similarly, Organic Nanomaterials have been primarily developed for drug delivery to reduce or overcome the risk of toxicity due to the intracellular and/or tissue sequestration there by increased bioavailability at the site of action.

**QUESTION )** With reference to the National Supercomputing Mission of India, consider the following statements:

- (1) The Mission is being jointly implemented by the Department of Science and Technology (DST) and the Ministry of Electronics and IT (MeitY).
- (2) It aims to connect national academic and R&D institutions of the country with a grid of over 70 high-performance computing facilities.
- (3) 'Pratyush' and 'Mihir' are the indigenously built super computers of the country under this mission.

Which of the statements given above is/are correct?

- (A) 1 and 2 only
- (B) 2 and 3 only
- (C) 1 and 3 only
- (D) 1, 2 and 3

Answer: (A) Statement 1 and 2 are correct: In the first phase of the National Supercomputing Mission, three supercomputer machines, to be fully designed, manufactured and assembled in India are being installed at IIT

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(BHU), IISER, Pune and IIT, Kharagpur. The government launched National Supercomputing Mission to connect national academic and R&D institutions with a grid of over 70 high-performance computing facilities at an estimated cost of Rs 4,500 crore in which Rs 2,800 crore will come from the Ministry of Science and Technology and the rest, about Rs 1,700 crore, from Ministry of Electronics and Information Technology (MeitY). It is being jointly implemented by the DST and MeitY. Statement 3 is not correct: In a major step towards R&D excellence and innovation, Prime Minister of India inaugurated National Supercomputing Mission's first indigenously build supercomputer 'Param Shivay' at Indian Institute of Technology, BHU, Varanasi. 'Pratyush' and 'Mihir' are the India's two fastest supercomputers built for weather forecasting. Pratyush and Mihir have recently broken into the top 100 list globally, surpassing the country's earlier ranking of 228 in November 2017.

**QUESTION )** With reference to the food adulteration in India, consider the following pairs:

Adulterants : Associated food products

- (1) TOCP (Tri-Ortho- Cresyl-Phosphate) — Honey
- (2) Papaya seeds — Black pepper
- (3) Lead chromate — Turmeric

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

- (A) 1 and 3 only
- (B) 2 and 3 only
- (C) 2 only

(D) 1, 2 and 3

Answer: (B) Adulteration is the process of adding unwanted substances to the food, with similar appearance/colour for making profits. Adulteration lowers the quality of food and sometimes, toxic chemicals are also added which can be hazardous to health. TOCP is usually added as adulterants in oils and fats Papaya seeds and Lead chromate are added to Black pepper and turmeric respectively. Additional Information: • Coffee seeds are adulterated with tamarind seeds, mustard seeds and also chicori. These adulterants are the main cause of diarrhoea. • Honey is commonly adulterated with molasses sugar. • Arhar dal is usually adulterated with metanil yellow

**QUESTION )** With reference to the genome editing technology, consider the following statements:

- (1) Genome editing technologies allow genetic material to be added, removed, or altered at particular locations in the genome.
- (2) USA scientists have developed a new variant of CRISPR-Cas9 by incorporating a new FnCas9 protein, for achieving high precision in the process.

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

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

Answer: (A) Statement 1 is correct: Genome editing (also called gene editing) is a group of technologies that give scientists the ability to change an organism's DNA. These technologies allow genetic material to be added, removed, or altered at particular locations in the genome. Several approaches to genome editing have been developed. A recent one is known as CRISPR-Cas9. Statement 2 is not correct: Indian scientists have developed a new variant of currently popular gene editing tool, CRISPR-Cas9, and have shown that this variant can increase precision in editing genome while avoiding unintended changes in DNA. The study has been done by researchers from the Delhi-based Institute of Genomics and Integrative Biology (IGIB) of the CSIR. One of the widely used Cas9 enzyme in gene editing is *Streptococcus pyogenes* Cas9 (SpCas9) and its engineered variants. They have been harnessed for several gene-editing applications across different platforms, but concerns remain regarding their off-targeting at multiple locations across the genome. To overcome these problems, Indian researchers used another naturally occurring Cas9 from a bacteria called *Francisella novicida*. This protein (FnCas9) has shown negligible binding affinity to off-targets.

**QUESTION )** With reference to different states of Matter, consider the following statements:

- (1) The BEC (Bose-Einstein Condensate) is formed by cooling a gas of extremely high density to super low temperatures.
- (2) The state of Plasma consists of super excited particles in the form of ionised gases.
- (3) Rydberg polaron has been claimed as the new state of matter.

Which of the statements given above is/are correct?

(A) 1 and 3 only

(B) 2 and 3 only

(C) 2 only

(D) 1, 2 and 3

Answer: (B) Statement 1 is not correct: In 1920, Indian physicist Satyendra Nath Bose had done some calculations for a fifth state of matter. Building on his calculations, Albert Einstein predicted a new state of matter – the Bose Einstein Condensate (BEC). The BEC is formed by cooling a gas of extremely low density, about one-hundred-thousandth the density of normal air, to super low temperatures. Statement 2 is correct: The state consists of super energetic and super excited particles. These particles are in the form of ionised gases. The fluorescent tube and neon sign bulbs consist of plasma. Statement 3 is correct: An international team of physicists have successfully created a “giant atom” and filled it with ordinary atoms, creating a new state of matter termed “Rydberg polarons”. These atoms are held together by a weak bond and is created at very cold temperatures

**QUESTION )** ‘Khalsa Swarupa’, the term that was recently seen in news, is:

(A) Name of the Khalsa established by Guru Gobind Singh.

(B) A traditional dress worn by Nihang Sikhs.

(C) Term used to refer Sikhism philosophy of oneness of God

(D) Code of conduct prescribed by the Guru Nanak for his disciples



## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

**Answer: (B)** In recent Ayodhya verdict, The Supreme Court mentioned that a group of Nihang Sikhs performed puja in the “mosque” in 1857. Nihang Sikhs are a particular sect of Sikhism. They were initially established by the later Sikh Guru prophets to defend against Mughal empire and to guard Sikh Gudwara temples. Traditional Nihang dress is known as Khalsa Swarupa. This comprises: • full attire of super electric blue. • edged bracelets of iron round their wrists (jangi kara). • quoits of steel (chakram) tiered in their lofty conical blue turbans, together with the traditional dagger carried by all Sikhs (kirpan). • When fully armed a Nihang will also bear one or two swords (either the curved talwar or the straight khanda) on his right hip, a katar (dagger) on his left hip, a buckler made from buffalo-hide (dhala) on his back, a large chakram around his neck, and an iron chain.

**QUESTION )** Pacific Decadal Oscillation, recently seen in news, is related to:

- (A) The swapping of the warm and cold currents in the Pacific Ocean basin.
- (B) A gyre of marine debris particles in the Pacific Ocean.
- (C) A long-term Pacific Ocean fluctuation.
- (D) A strong El Nino event in the Pacific Ocean.

**Answer: (C)** The Pacific Decadal Oscillation (PDO) is a long-term ocean fluctuation of the Pacific Ocean. PDO is a long-lived, El Niño-like pattern of Pacific climate variability. Both PDO and ENSO have similar spatial climate fingerprints. Yet the major difference is that PDO persists for 20-30 years while the typical ENSO persists for 6 to 18 months. The PDO, like ENSO, consists of a warm and cool phase which alters upper level atmospheric winds. Northeast India, one of the wettest places on the Earth has been

experiencing rapid drying, especially in the last 30 years. The decreasing monsoon rainfall is associated with natural changes in the Pacific decadal oscillation (PDO).

**QUESTION )** Identify the following gaseous pollutant:

- (1) It is a colourless and odourless gas.
- (2) It binds to haemoglobin to form a complex, which is about 300 times more stable than the oxygenhaemoglobin complex.
- (3) It is mainly released into the air by automobile exhaust.

Select the correct answer using the code given below:

- (A) Methane
- (B) Sulphur Dioxide
- (C) Nitrous Oxide
- (D) Carbon monoxide

**Answer: (D)** Carbon monoxide (CO) is one of the most serious air pollutants. It is a colourless and odourless gas, highly poisonous to living beings because of its ability to block the delivery of oxygen to the organs and tissues. It is produced as a result of incomplete combustion of carbon. Carbon monoxide is mainly released into the air by automobile exhaust. It binds to haemoglobin to form carboxyhaemoglobin, which is about 300 times more stable than the oxygen-haemoglobin complex. In blood, when the concentration of carboxyhaemoglobin reaches about 3–4 percent, the oxygen carrying capacity of blood is greatly reduced. This oxygen

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

deficiency, results into headache, weak eyesight, nervousness and cardiovascular disorder

**QUESTION )** With reference to Optical Conductivity, consider the following statements:

- (1) Optical conductivity of a material can indicate if the material is transparent or opaque.
- (2) Semi-Dirac materials offer high optical conductivity for electromagnetic waves of a specific frequency and specific polarisation.

Which of the statements given above is/are not correct?

- (A) 1 only
- (B) 2 only
- (C) Both 1 and 2
- (D) Neither 1 nor 2

**Answer: (D)** Statement 1 and Statement 2 are correct: • The optical conductivity of a material decides its response to electromagnetic waves, including light. • Optical conductivity of a material can indicate if the material is transparent or opaque. For instance, an increased optical conductivity would mean higher absorption of electromagnetic waves.

Semi-Dirac materials offer high optical conductivity for electromagnetic waves (light waves) of a specific frequency and specific polarization

It means that Semi-Dirac materials would be transparent to light of a given frequency and polarisation when it is incident along a particular direction. • The material would be opaque to the same light when it falls on it from a

different direction. • There are many known applications for transparent conducting films – the common example being touch screens used in mobiles.

**QUESTION )** With reference to Gravitational waves, consider the following statements:

- (1) They are ripples in space time caused by massive accelerating objects.
- (2) They travel at speed of light.
- (3) Their existence was predicted by Einstein in general theory of relativity.

Which of the following statements is/are correct?

- (A) 1 and 2 only
- (B) 1 and 3 only
- (C) 2 and 3 only
- (D) 1, 2 and 3

**Answer: (D)** Statement 1 and 3 are correct: Gravitational waves are ripples in space-time caused by some of the most violent and energetic processes in the Universe. Albert Einstein predicted the existence of gravitational waves in 1916 in his general theory of relativity. Einstein's mathematics showed that massive accelerating objects (such as neutron stars or black holes orbiting each other) would disrupt space-time in such a way that 'waves' of distorted space would radiate from the source (like the movement of waves away from a stone thrown into a pond). Statement 2 is correct: These ripples caused by gravitational waves travel at the speed of



## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

light through the Universe, carrying with them information about their cataclysmic origins, as well as clues to the nature of gravity itself.

**QUESTION )** With reference to Solar activity phenomena, consider the following statements:

- (1) Sun spots are relatively cool areas on sun's surface where magnetic field is particularly weak.
- (2) Solar flare is sudden explosion of energy due to crossing of magnetic field lines near sunspots.
- (3) Coronal Mass Ejections (CMEs) are large expulsions of plasma and magnetic field from the Sun.

Which of the following statements is/are correct?

- (A) 1 and 2 only
- (B) 1 and 3 only
- (C) 2 and 3 only
- (D) 1, 2 and 3

**Answer: (C)** Statement 1 is not correct: Sunspots are areas that appear dark on the surface of the Sun. They appear dark because they are cooler than other parts of the Sun's surface. Sunspots form at areas where magnetic fields are particularly strong. These magnetic fields are so strong that they keep some of the heat within the Sun from reaching the surface. Statement 2 is correct: Solar flare is sudden explosion of energy due to crossing of magnetic field lines near sunspots. Thus, Solar flares can temporarily alter the upper atmosphere creating disruptions with signal transmission from

a GPS satellite to Earth. Statement 3 is correct: Coronal mass ejection is huge bubbles of radiation and particles from Sun which explode into space at high speed when Sun's magnetic field lines reorganize

**QUESTION )** With reference to Longitudinal and transverse waves, consider the following statements:

- (1) In longitudinal wave, particles of medium move perpendicular in direction of wave medium.
- (2) In transverse wave, the displacement of the particles and propagation of the wave are in the same direction.
- (3) While transverse waves form only in fluids, the longitudinal waves can form in solid, liquid and gas.

Which of the following statements is/are correct?

- (A) 1 and 2 only
- (B) 1 and 3 only
- (C) 1 only
- (D) 3 only

**Answer: (D)** Waves can be of different types. These may be mechanical or electromagnetic. Mechanical waves are those waves that require a medium for travelling. An electromagnetic wave results from acceleration of charge. It doesn't require a medium to travel. Mechanical waves can be either transverse or longitudinal while the electromagnetic wave is only transverse. Statement 1 and 2 are not correct: In transverse wave, particles of medium move perpendicular in direction of wave medium. While in

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

longitudinal wave, the displacement of the particles and propagation of the wave are in the same direction. Statement 3 is correct: While transverse waves form only in fluids (air and liquid), the longitudinal waves can form in solid, liquid and gas. Examples of transverse waves include vibrations on a string and ripples on the surface of water. Examples of longitudinal waves include: sound waves; ultrasound waves and seismic P-waves.

**QUESTION )** Which of the following is/are classified under the category of Plants?

- (1) Angiosperms
- (2) Bryophytes
- (3) Pteridophytes

Select the correct answer using the code given below:

- (A) 1 only
- (B) 2 and 3 only
- (C) 1 and 3 only
- (D) 1, 2 and 3

Answer: (D) All options are correct: Plants are divided into five groups: Thallophytes, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms. Thallophytes are plants with non-well differentiated body. Most of the plants are aquatic. Examples - cladophora, Chara etc.

Bryophytes are called amphibians of the plant kingdom because these plants can live in soil but are dependent on water for sexual reproduction. The plant body is commonly differentiated to form stem and leaf-like

structures. However, there is no specialized tissue for the conduction of water and other substances from one part of the plant body to another. Pteridophytes are plants where the plant body is differentiated into roots, stem and leaves and has specialized tissue for the conduction of water and other substances from one part of the plant body to another. Some examples are marsilea, ferns and horse-tails. Gymnosperms are flowerless plants that produce cones and seeds. The term gymnosperm literally means “naked seed,” as gymnosperm seeds are not encased within an ovary. Rather, they sit exposed on the surface of leaf-like structures called bracts

Angiosperms are vascular plants. They have stems, roots, and leaves. Unlike gymnosperms such as conifers and cycads, angiosperm’s seeds are found in a flower. Angiosperm eggs are fertilized and develop into a seed in an ovary that is usually in a flower.

**QUESTION )** Which of the following statements best describe the term “Quantum Supremacy”?

- (A) It is a demonstration that a programmable quantum device can solve a problem that classical computers practically cannot.
- (B) It is harnessing and exploiting the laws of quantum mechanics to process information.
- (C) It is applying the principles of quantum mechanics to encrypt messages in a way that it is never read by anyone outside of the intended recipient.
- (D) It is running workloads remotely over the internet in a commercial provider’s data.

Answer: (A)

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

Option (A) is correct: In quantum computing, quantum supremacy is the goal of demonstrating that a programmable quantum device can solve a problem that classical computers practically cannot. In near future, Quantum Computers could leave standard computers in the dust on a variety of problems, such as database searches, chemistry calculations and machine-learning tasks. Option (B) is not correct: Harnessing and exploiting the laws of quantum mechanics to process information is the basic definition of Quantum Computing. Option (C) is not correct: Applying the principles of quantum mechanics to encrypt messages in a way that it is never read by anyone outside of the intended recipient, means Quantum cryptography, also called as quantum encryption. Option (D) is not correct: Running workloads remotely over the internet in a commercial provider's data is related to Cloud Computing. It is the "public cloud" model

**QUESTION )** With reference to artificial satellites, consider the following statements:

- (1) Satellites in Sun synchronous orbits have higher altitude than those in geosynchronous orbits.
- (2) Sun synchronous satellites arrive at the same latitude at the same time every day.
- (3) Geo synchronous satellites have same orbital period as period of rotation of earth.

Which of the statements given above is/are correct?

- (A) 2 only  
(B) 2 and 3 only

(C) 1 and 3 only

(D) 1, 2 and 3

Answer: (B) Statement 1 is not correct: Sun synchronous satellites have orbit at height of around 800 km while for geosynchronous satellites, altitude is around 36000 km. Thus, Satellites in geosynchronous orbits have higher altitude than those in sun synchronous orbits. Statement 2 is correct: Sun synchronous satellite arrives at the same latitude at the same time every day. During repeated crossing, the satellite can scan the whole earth as it spins about its axis. Such satellites are used for collecting data for weather prediction, monitoring floods, crops, bushfires, etc. Statement 3 is correct: Geo-synchronous satellites have the same orbital period as the period of rotation of the earth, equal to 24 hours. Since their orbital period matches that of the earth, they appear to be hovering above the same spot on the earth. A combination of such satellites covers the entire globe, and signals can be sent from any place on the globe to any other place. Since a geo-synchronous satellite observes the same spot on the earth all the time, it can also be used for monitoring any peculiar happening that takes a long time to develop, such as severe storms and hurricanes.

**QUESTION )** With reference to bile juice in human digestive system, consider the following statements:

- (1) It is secreted by the liver.
- (2) It is an acidic liquid containing hydrochloric acid.
- (3) It contains digestive enzymes which aid in digestion of food.

Which of the statements given above is/are correct?

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(A) 1 only

(B) 2 and 3 only

(C) 1 and 3 only

(D) 1, 2 and 3

**Answer:** (A) Statement 1 is correct: Bile is a yellowish, green liquid secreted by liver. The yellowish green colour of the bile is due to the pigments biliverdin and bilirubin produced by the breakdown of the dead and worn out RBCs (Red Blood corpuscles). These pigments are excreted in faeces (solid or semi-solid waste and undigested food) that is thrown out through the anus. Statement 2 is not correct: Bile is an alkaline liquid (pH about 8). It consists of (i) water (98%), (ii) sodium carbonate in large quantity which neutralizes the acid of the chyme (semi digested food) received from stomach; makes it alkaline, and (iii) bile salts (sodium glycocholate and sodium taurocholate) which emulsify fats. Statement 3 is not correct: Bile has no digestive enzymes. It simply emulsifies fats.

**QUESTION )** With reference to lipoproteins, consider the following statements:

(1) High density lipoprotein is called 'bad cholesterol' while low density lipoprotein is called 'good cholesterol'.

(2) Low density lipoprotein carries cholesterol from other parts of body back to liver from where it is removed.

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

**Answer:** (D) Statements 1 and 2 are not correct: Lipoproteins are a combination of fat (lipid) and protein. The lipids need to be attached to the proteins so they can move through the blood. HDL stands for high-density lipoprotein. It is sometimes called "good" cholesterol because it carries cholesterol from other parts of body back to liver.

Liver then removes the cholesterol from your body. LDL stands for low-density lipoprotein. It is sometimes called "bad" cholesterol because a high LDL level leads to the buildup of plaque in your arteries.

**QUESTION )** Early diagnosis and understanding its pathophysiology is very important for effective treatment of a disease.

Which of the following techniques are widely used for early diagnosis?

(1) Serum analysis

(2) Recombinant DNA technology

(3) Polymerase Chain Reaction (PCR)

(4) Enzyme Linked Immuno-sorbent Assay (ELISA)

Select the correct answer using the code given below:

(A) 1 and 2 only

(B) 1, 2 and 3 only

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(C) 2, 3 and 4 only

(D) 1, 2, 3 and 4

Answer: (C) For effective treatment of a disease, early diagnosis and understanding its pathophysiology is very important. Using conventional methods of diagnosis (serum and urine analysis, etc.) early detection is not possible. Recombinant DNA technology, Polymerase Chain Reaction (PCR) and Enzyme Linked Immuno-sorbent Assay (ELISA) are some of the techniques that serve the purpose of early diagnosis.

**QUESTION )** With reference to nuclear reactions, consider the following statements:

- (1) In nuclear fission, a heavy nucleus breaks into two or more smaller fragments.
- (2) A chain reaction is made possible because more neutrons are produced in the single reaction than are consumed.
- (3) Fusion of Hydrogen nuclei into Helium nuclei is the source of energy of all stars including our sun.

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

Answer: (D)

Statement 1 is correct: When a free neutron hits the nucleus of a fissile atom like uranium-235 ( $^{235}\text{U}$ ), the uranium splits into two smaller atoms called fission fragments, plus more neutrons. Energy is released when less tightly bound nuclei are transmuted into more tightly bound nuclei. Statement 2 is correct: Fission can be self-sustaining because it produces more neutrons with the speed required to cause new fissions. This creates the chain reaction. The chain reaction is uncontrolled and rapid in a nuclear bomb explosion. It is controlled and steady in a nuclear reactor. In a reactor, the value of the neutron multiplication factor  $k$  is maintained at (1) Statement 3 is correct: In fusion, lighter nuclei combine to form a larger nucleus. Fusion of hydrogen nuclei into helium nuclei is the source of energy of all stars including our sun.

**QUESTION )** Recently, Indian Army launched e-cars to curb air pollution. With reference to introduction of E-Cars to Indian market, consider the following statements:

- (1) The initiative is in partnership with Ministry of New and Renewable Energy.
- (2) The FAME-2 scheme is launched by Ministry of Heavy Industries and will help in increasing the fleet of electric vehicles in the country.
- (3) The increased usage of e-vehicles can lead to reduced current account deficit. Which of the statements given above is/are correct?

- (A) 2 and 3 only
- (B) 1 and 2 only
- (C) 1 and 3 only

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(D) 3 only

Answer: (A) Statement 1 is not correct: The initiative is in partnership with Energy Efficiency Services Ltd (EESL) and is a joint venture of the central PSUs under the Ministry of Power. Statement 2 is correct: FAME-2 scheme, to boost electric mobility and increase the number of electric vehicles in commercial fleets. Statement 3 is correct: India can save 64% of anticipated road-based mobility-related energy demand and 37% of carbon emissions in 2030 by pursuing a shared, electric, and connected mobility future. This would result in reduction of 156 million tonnes of oil equivalent (mtoe) in diesel and petrol consumption for that year and net saving of approximately \$60 billion in 2030 at present oil prices.

**QUESTION )** With reference to the Bureau of Energy Efficiency, consider the following statements:

- (1) It is a body under the Ministry of New and Renewable Energy.
- (2) Energy Conservation Building Code (ECBC) and 'Performance Achieve Trade' (PAT) are its flagship programmes.

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

Answer: (B) Statement 1 is not correct: The Government of India set up Bureau of Energy Efficiency (BEE). in 2002 under the provisions of the

Energy Conservation Act, 2001, under the Ministry of Power. Statement 2 is correct: Energy Conservation Building Code (ECBC), Star label, 'Performance- Achieve Trade' (PAT), Demand Side Management (DSM) are its flagship programmes

**QUESTION )** With reference to the Malaria Vaccine RTS, S consider the following statements:

- (1) RTS, S is the world's first malaria vaccine that provide complete protection against malaria in young children.
- (2) The vaccine is designed to prevent the parasite from entering the human body.

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

Answer: (D) Government of Malawi recently launched the world's first malaria vaccine in a landmark pilot programme. It has been developed by British pharmaceutical company GlaxoSmithKline in partnership with the PATH Malaria Vaccine Initiative (a non-profit organisation). Statement 1 is not correct: RTS, S is the world's first malaria vaccine shown to provide partial protection against malaria in young children. RTS,S aims to trigger the immune system to defend against the first stages of malaria when the Plasmodium falciparum parasite enters the human host's bloodstream through a mosquito bite and infects liver cells. Statement 2 is not correct:





## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

The vaccine is designed to prevent the parasite from infecting the liver, where it can mature, multiply, re-enter the bloodstream, and infect red blood cells, which can lead to disease symptoms.

**QUESTION )** Which of the following is the main objective of NASA's TESS satellite?

- (A) Discovering exo-planets
- (B) Accurate weather prediction
- (C) Identifying the space debris
- (D) Studying the outer atmosphere of Sun

Answer:A

Explanation:

TESS is an MIT-led NASA mission, an all-sky survey for transiting exo-planets. TESS anticipates the discovery of thousands of exo-planets of all sizes around a variety of star types. It has committed to delivering 50 planets of size less than 4 Earth radii with measured masses to the community.

**QUESTION )** Consider the following statements

- (1) Gravitational lensing refers to the phenomena of the bending of light by extreme gravity.
- (2) Albert Einstein was among the first few scientists who predicted gravitational lensing.

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

Answer: C

Statement 1 is correct- Gravitational lensing refers to the phenomena of the bending of light by extreme gravity. The effects of gravitational lensing is extremely difficult to detect as it requires a distant star, black hole and the observer on earth to be well-aligned.

Statement 2 is correct- Albert Einstein was among the first few scientists who predicted gravitational lensing. Albert Einstein had shown that the fabric of space-time itself was curved because of presence of massive objects like stars and planets, and that light travelling in a straight line will follow these curves and appear bent.

**QUESTION )** With reference to Li-Fi, consider the following statements:

- (1) It uses visible light for transmission of data.
- (2) It provides better bandwidth and security than Wi-Fi.
- (3) It involves the transfer of data through any light bulb.

Which of the statements given above are correct?

- (A) 1 and 2 only
- (B) 1 and 3 only

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(C) 2 and 3 only

(D) 1, 2 and 3

Answer: A

Statement 1 is correct: Li-Fi is a wireless optical networking technology that uses light emitting diodes (LEDs) for transmission of data. The term Li-Fi refers to visible light communication (VLC) technology that uses light as medium to deliver high-speed communication in a manner similar to Wi-Fi.

Statement 2 is correct: Li-Fi provides better bandwidth, efficiency, connectivity and security than Wi-Fi and has already achieved high speeds larger than 1 Gbps under the laboratory conditions.

Statement 3 is not correct: Li-Fi is the transfer of data through light by taking fibre out of fibre optics and sending data through LED light bulb.

**QUESTION )** Consider the following statements about fifth generation technology(5G):

- (1) It will provide better communications with high latency.
- (2) It can be used in the fields of healthcare and agricultural sectors.
- (3) The spectrum auction of this technology will be conducted under the Cabinet Committee on Economic Affairs.

Which of the statements given above is/are correct?

(A) 1 only

(B) 2 and 3 only

(C) 2 only

(D) 1, 2 and 3

Answer: C

Statement 1 is incorrect : It is the next generation cellular technology that will provide faster and more reliable communication with ultra-low latency. Latency is the amount of time data takes to travel between its source and destination.

Statement 2 is correct : As per a Government panel report the technology will extend the use of wireless technologies — for the first time — across completely new sectors of the economy from industrial to commercial, educational, health care, agricultural, financial and social sectors.

Statement 3 is incorrect In India, Department of Telecommunications conducts the Spectrum Auction.

**QUESTION )** Consider the following statements about Gaganyaan program:

- (1) It is India's Human Space Flight Mission to be conducted in the year 2022.
- (2) NASA will provide technological advice for this mission.

Which of the statements given above is/are correct?

(A) 1 only

(B) 2 only

(C) Both 1 and 2

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(D) Neither 1 nor 2

Answer: A

Explanation:

Statement 1 is correct: The Gaganyaan Mission will carry Indian astronaut to space in 2022. It coincided with India's 75th anniversary of Independence.

Statement 2 is incorrect : India's strategic partner Russia will transfer critical technology for Gaganyaan project besides other futuristic space programmes and partner Delhi for joint collaborations including presence at the prestigious International Space Station (ISS)

Russia has promised all assistance for India's Human Space Flight Mission Gaganyaan.

**QUESTION )** Mr. X was being tested for his knowledge in defence sector. He was given few hints and on the basis he rightly identified the missile. The Hints were:

- (1) It is an all weather and all terrain missile
- (2) It uses solid-fuel propellant
- (3) Its range was around 25-30 km

From the code given below select the answer as given by Mr.X

- (A) Prahaar
- (B) QRSAM
- (C) Dhanush

(D) None of the above

Answer: B

Option b is correct: The all-weather and all-terrain missile, which can be mounted on a truck and stored in a canister, is equipped with electronic counter measures against jamming by aircraft radars. QRSAM uses solid-fuel propellant and has a range of 25-30 km.

**Dhanush Missile:** India also possesses an estimated two ship-launched 350-km range Dhanush SRBMs, which could be fitted with nuclear warheads. It has been developed for the Indian Navy. Dhanush is capable of carrying both conventional as well as nuclear warheads with a payload capacity of 500 kg- 1000 kg and can strike targets in the range of 350 km.

**Prahaar Missile:** Prahaar is a solid-fuel road-mobile tactical ballistic missile developed by the DRDO. Prahaar is expected to replace the Prithvi-I short-range ballistic missile in Indian service. This solid-fuelled missile can be launched within 2–3 minutes without any preparation, providing significantly better reaction time than liquid-fuelled Prithvi ballistic missiles and act as a gap filler in the 150 km range.

**QUESTION )** Consider the following statements about LIDAR:

- (1) LiDAR is limited in night-time and bad weather conditions, whereas RADAR is not sensitive to different environments.
- (2) It uses light in the form of a pulsed laser to measure ranges.

Which of the statements given above is/are correct?

- (A) 1 only

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(B) 2 only

(C) Both 1 and 2

(D) Neither 1 nor 2

Answer: C

Statement 1 and 2 are correct: LIDAR, which stands for Light Detection and Ranging is a remote sensing method that uses light in the form of a pulsed laser to measure ranges (variable distances) to the Earth. Radar uses radio waves for its signal, LIDAR uses a pulse of light.

LiDAR is limited in night-time and bad weather conditions, whereas RADAR is not sensitive to different environments.

**QUESTION )** Consider the following Statements regarding A-SAT missile test

(1) A-SAT is a part of Mission Shakti.

(2) India is signatory to Outer space Treaty.

(3) Target in Low earth Orbit (LEO) was used as pre-defined target.

Which of the statements given above are not correct?

(A) 1 and 3 only

(B) 1 and 2 only

(C) 2 and 3 only

(D) None of the above

Answer: D

Statement 1 is correct: India becomes the 4th country to conduct A-SAT missile test —Mission Shakti successfully. India has proved its capability of defending its outer space assets after Defence Research and Development Organisation (DRDO) has conducted a successful Anti-Satellite (A-SAT) missile test —Mission Shakti. This is India's first successful Anti-Satellite (A-SAT) missile test.

Statement 2 is correct: The principal international Treaty on space is the 1967 Outer Space Treaty, which prohibits only weapons of mass destruction in outer space, not ordinary weapons. India is a signatory to this treaty. So, adhering to this, this test was just a credible deterrence against threats to India's space based assets.

Statement 3 is correct: The target was hit by the DRDO developed Ballistic Missile Defence (BMD). Interceptor Missile, in Low Earth Orbit (LEO) in a —Hit to Kill mode at a height of 300 km from the earth's surface.

The satellite used as target in the mission was one of India's existing satellites.

**QUESTION )** Recently, there is an increased focus on the Neutrino detectors in various parts of the world. In this context, consider the following applications

(1) Neutrino can help in identifying mineral / oil deposits.

(2) Faster global communication.

(3) Communication with extraterrestrial life

Which of the above given applications are plausible?



## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(A) 1 only

(B) 2 and 3 only

(C) 1 and 3 only

(D) 1, 2 and 3

Statement 1 is correct: Neutrinos change the way they spin depending on how far they have traveled and how much matter they have passed through. So geophysicists have proposed that analyzing the way a beam of neutrinos are spinning after passing through pockets of of the Earth could reveal where mineral deposits are.

Statement 2 is correct: It would be faster to send the message through it rather than over it.

Statement 3 is correct: Encoded neutrinos could be beamed into space and these can travel continuously.

**QUESTION )** With reference to optical communication (OC), consider the following statements:

(1) In optical communication, signal in the form of light waves is transmitted through metal wires to the remote end.

(2) OC signal can be transmitted through medium of electrical channel.

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

Answer: A

Statement 1 is correct: Optical communication is in which light is used to carry the signal to the remote end. Optical communication relies on optical fibers to carry signals to their destinations.

Statement 2 is incorrect: OC signal can be transferred through either OFC or by Light guided medium, OC signal can't guide through conventional electrical medium. For such purposes optical fibers have largely replaced copper wire communications in core networks to boost optical communication.

**QUESTION )** Consider the following pairs:

Goods : Demand Elasticities

(1) Complements : positive cross elasticity

(2) Substitute : negative cross elasticity

(3) Independent : zero cross elasticity

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

(A) 3 only

(B) 2 and 3 only

(C) 1 and 3 only

(D) 1, 2 and 3

Answer: A

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

Pair 1 is incorrect:

**Complements:** Two goods that complement each other have a negative cross elasticity of demand: as the price of good Y rises, the demand for good X falls.

Pair 2 is incorrect:

**Substitutes:** Two goods that are substitutes have a positive cross elasticity of demand: as the price of good Y rises, the demand for good X rises.

Pair 3 is correct:

**Independent:** Two goods that are independent have a zero cross elasticity of demand: as the price of good Y rises, the demand for good X stays constant.

**QUESTION )** Consider the following statements with reference to Internet of Things (IoT):

(1) IoT is a network of interconnected physical objects which collect and exchange data over the internet.

(2) In manufacturing, the IoT becomes the Industrial Internet of Things (IIoT), also known as Industry 4.0.

(3) IoT acts as an enabler in the development of Smart Cities.

Which of the statements given above is/are correct?

(A) 1 only

(B) 1 and 2 only

(C) 2 and 3 only

(D) 1, 2 and 3

Answer: D

**Statement 1 is correct:** The Internet of Things is the inter networking of physical devices, vehicles, buildings and other items embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.

**Statement 2 is correct:** In manufacturing, the IoT becomes the Industrial Internet of Things (IIoT) – also known as the Industrial Internet or Industry 4.0 or ThelloT uses machine to machine (M2M) technology to support everything from remote monitoring and telemetry to predictive maintenance.

**Statement 3 is correct:** Internet of Things (IoT) applications are enabling Smart City initiatives worldwide. With a large volume of sensor-based infrastructure, citizen-centric solutions and big data analytics solutions being taken up in most smart cities, the Internet of Things (IoT) ecosystem provides the right platform to manage and monitor modern urban landscape.

**QUESTION )** Consider the following statements about the plausible applications of Quantum Dots

(1) Controlling its size can also control the colour of light emitted by it.

(2) These could be used in the communication sector for high speed data transfer

Which of the statements given above is/are correct?

(A) 1 only



## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(B) 2 only

(C) Both 1 and 2

(D) Neither 1 nor 2

Answer: C

Statement 1 is correct: Quantum dots emit light when excited, with smaller dots emitting higher energy light. Manufacturers can accurately control the size of a quantum dot and as a result they are able to 'tune' the wavelength of the emitted light to a specific color.

Statement 2 is correct: Quantum dots are being used to produce miniature lasers for use in communications devices. The advantage of these lasers will be high speed data transfer with low power consumption.

**QUESTION )** Consider the following statements about Parker Solar Probe:

(1) It is an initiative of ISRO in collaboration with European Space Agency.

(2) It aims to determine the structure and dynamics of the plasma and magnetic fields at the source of the solar wind.

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

Answer: B

Statement 1 is incorrect- The Parker Solar Probe is part of the NASA Living with a Star Program (or LWS), meant to explore aspects of the Sun-Earth system that directly affect life and society. The Living with a Star (LWS) program focuses on the science necessary to understand aspects of the Sun and Earth's space environment that affect life and society.

Statement 2 is correct- Parker Solar Probe aims to provide new data on solar activity and make critical contributions to our ability to forecast major space-weather events that impact life on Earth. Parker Solar Probe has the following

objectives:

- Trace the flow of energy that heats and to explore what accelerates the solar corona and solar wind.

- Determine the structure and dynamics of the plasma and magnetic fields at the sources of the solar wind.

- Explore mechanisms that accelerate and transport energetic particles.

**QUESTION )** With reference to the SpaceX Crew-3 mission, consider the following statements:

(1) The Crew-3 mission is part of NASA's contract with SpaceX, under its Commercial Crew Programme, as per which SpaceX will provide six crew missions to the ISS for NASA astronauts.

(2) Raja Chari is among the three astronauts selected by the National Aeronautics and Space Administration (NASA) and the European Space Agency (ESA) to fly to the International Space Station (ISS) as part of the SpaceX Crew-3 mission.

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

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

Answer: C

Raja Chari is among the three astronauts selected by the National Aeronautics and Space Administration (NASA) and the European Space Agency (ESA) to fly to the International Space Station (ISS) as part of the SpaceX Crew-3 mission. The Indian-American will command the mission, which is expected to launch in the fall of 2021.

Earlier this year in January, Chari became one of the 11 astronauts to join NASA's ranks. The new graduates completed more than two years of basic training and became the first to graduate from NASA's Artemis programme. Under the programme, NASA wants to send the next man and first woman to the Moon by 2024.

The Crew-3 mission is part of NASA's contract with SpaceX, under its Commercial Crew Programme, as per which SpaceX will provide six crew missions to the ISS for NASA astronauts.

The idea is to provide reliable, safe and cost-effective crew access to the space station and the low-Earth orbit.

The crew members will spend six months at the ISS.

Hence both statements are correct.

**QUESTION )** With reference to the Yogasana, consider the following statements:

- (1) It is an integral and important component of Yoga, which is psycho-physical in nature and popular across the globe for its efficacy in fitness and general wellness.
- (2) The Ministry of AYUSH and Ministry of Youth Affairs and Sports announced the formal recognition of Yogasana as a competitive sport.

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

Answer: C

The Ministry of AYUSH and Ministry of Youth Affairs and Sports announced the formal recognition of Yogasana as a competitive sport at a joint press conference.

The origins of Yogasana competitions can be traced to the Indian Yoga tradition, where such competitions have been held for centuries.

Yogasana is an integral and important component of Yoga, which is psycho-physical in nature and popular across the globe for its efficacy in fitness and general wellness.

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

Competitions that will arise out of the recognition of Yogasana as a sport will enhance interest in Yoga among people around the globe.

Government of India is planning to include Yogasana as a Sport discipline in National Games, Khelo India and international sports events.

Hence both statements are correct.

**QUESTION )** With reference to the PSLV-C50 /CMS-01, consider the following statements:

(1) CMS-01 is envisaged to provide services in the extended-C Band of the frequency spectrum that will cover the Indian mainland, the Andaman and Nicobar and Lakshadweep Islands.

(2) It was India's 10th communication satellite with a mission life of over seven years.

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

Answer: A

India's communication satellite CMS-01 was successfully launched by PSLV-C50 on December 17, 2020 from the Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota.

CMS-01 is envisaged to provide services in the extended-C Band of the frequency spectrum that will cover the Indian mainland, the Andaman and Nicobar and Lakshadweep Islands.

It was India's 42nd communication satellite with a mission life of over seven years.

The satellite will be placed in the specified slot in the geosynchronous orbit. Subsequently, it will function as the continuation of GSAT11 launched 11 years back.”

PSLV-C50 is the 52nd flight of PSLV and 22nd flight of PSLV in 'XL' configuration (with 6 strap-on motors).

**QUESTION )** With reference to the Lancet Citizens' Commission on Reimagining India's Health System, consider the following statements:

(1) It is a cross-sector initiative to develop a citizens' roadmap to achieving universal health coverage (UHC) in India over a period of ten years, was launched online.

(2) The mission of the Commission is to lay out the path to achieving UHC in India in the coming decade, working with all stakeholders.

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

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

Answer: C

The Lancet Citizens' Commission on Reimagining India's Health System, a cross-sector initiative to develop a citizens' roadmap to achieving universal health coverage (UHC) in India over a period of ten years, was launched online.

It was a first-of-its-kind participatory, countrywide initiative, in collaboration with world's leading health journal The Lancet and the Lakshmi Mittal and Family South Asia Institute, Harvard University.

The mission of the Commission is to lay out the path to achieving UHC in India in the coming decade, working with all stakeholders.

The Commission will be guided by four principles: first, UHC covers all health concerns;

secondly, prevention and long-term care are key;

Thirdly, the concern is financial protection for all health costs, and

finally, aspiring for a health system that can be accessed by all who enjoy the same quality.

Hence both statements are correct.

**QUESTION )** With reference to the Advanced Towed Artillery Gun System (ATAGS), consider the following statements:

(1) It was developed by Hindustan aeronautics limited.

(2) The user trials of the indigenous Advanced Towed Artillery Gun System (ATAGS) will be completed by mid-2021

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

Answer: B

User trials of the indigenous Advanced Towed Artillery Gun System (ATAGS) developed by the Defence Research and Development Organisation (DRDO) jointly with private industry are scheduled to be resumed later this month and the trials will be completed by mid-2021.

**QUESTION )** With reference to the Fordow Fuel Enrichment Plant (FFEP), consider the following statements:

(1) It is an Iranian underground uranium enrichment facility located 20 miles northeast of the Iranian city of Qom, near Fordow village.

(2) It is the first Iranian uranium enrichment facility.

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

Answer: A

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

According to satellite images, Iran has begun construction on a site at its underground nuclear facility at Fordow amid tensions with the U.S. over its atomic programme.

Fordow Fuel Enrichment Plant (FFEP) is an Iranian underground uranium enrichment facility located 20 miles northeast of the Iranian city of Qom, near Fordow village.

It is the second Iranian uranium enrichment facility, the other one being that of Natanz.

Iran has not publicly acknowledged any new construction at Fordow, whose discovery by the West in 2009 came in an earlier round of brinkmanship before world powers struck the 2015 nuclear deal with Tehran.

**QUESTION )** With reference to the Shigellosis, or shigella infection, consider the following statements:

- (1) It is a contagious intestinal infection caused by a genus of bacteria known as shigella(A)
- (2) The infection is known to spread person-to-person when the bacteria is swallowed accidentally

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

Answer: C

Explanation :

Health officials in Kozhikode district of Kerala kicked in preventive measures last week after six cases of shigella infection and nearly two dozen suspected cases were detected.

Shigellosis, or shigella infection, is a contagious intestinal infection caused by a genus of bacteria known as shigella.

The bacteria is one of the prime pathogens responsible for causing diarrhoea, fluctuating between moderate and severe symptoms, especially in children in African and South Asian regions.

The bacteria, after entering the body through ingestion, attacks the epithelial lining of the colon resulting in inflammation of the cells and subsequently the destruction of the cells in severe cases.

The common symptoms are diarrhoea (often bloody and painful), stomach pain, fever, nausea and vomiting.

The infection is known to spread person-to-person when the bacteria is swallowed accidentally. Spread through contaminated food and water is the most common form of transmission across the world.

Prevention: It's important to wash hands with soap especially after dealing with a child's diaper and before preparing/eating food.

Hence both statements are correct.

**QUESTION )** With reference to the Status of Leopards report, consider the following statements:

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

(1) The highest concentration of the leopard in India is estimated to be in Kerala.

(2) There are 12,852 leopards in India as of 2018 as compared to the previous estimate of 7910 conducted 2014, an increase of 60% in 4 years.

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

Answer: B

Explanation :

Union Minister for Environment Prakash Javadekar released the Status of Leopards report.

The leopard population has been estimated using camera trapping method.

There are 12,852 leopards in India as of 2018 as compared to the previous estimate of 7910 conducted 2014, an increase of 60% in 4 years.

The highest concentration of the leopard in India is estimated to be in Madhya Pradesh (3,421) followed by Karnataka (1,783) and Maharashtra (1,690).

Recent meta-analyses of leopard status and distribution suggest 48–67% range loss for the species in Africa and 83–87% in Asia.

In India, leopards have experienced a possibly human-induced 75-90% population decline in the last ~120-200 years.

In Indian subcontinent poaching, habitat loss, depletion of natural prey and conflict are major threats to leopard populations. All these have resulted in changing the species status from 'Near Threatened' to 'Vulnerable' by the International Union for Conservation of Nature (IUCN).

As for region-wise distribution, the highest number of 8,071 leopards were found in central India and eastern ghats. In the northeast hills, there are just 141 leopards.

The leopard was estimated across forested habitats in tiger range areas of the country but other leopard occupied areas such as non-forested habitats, higher elevations in the Himalayas, arid landscapes and majority of North East landscape were not sampled.

Therefore, the population estimation should be considered as minimum number of leopards in each of the landscapes.

Hence only statement 2 is correct.

**QUESTION )** With reference to the “Electricity (Rights of Consumers) Rules, 2020”, consider the following statements:

(1) Consumers across the country will now have the right to a minimum standard of service for supply of electricity.

(2) A new connection has to be given within a maximum time period of seven days in metro cities, 15 days in other municipal areas, and 30 days in rural areas.

(3) Electricity is a state subject.



## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

Which of the statements given above is/are correct?

- (A) 1 and 2 only
- (B) 2 and 3 only
- (C) 1 and 3 only
- (D) 1, 2 and 3

Answer: A

Union Government has for the first time laid down Rights to the Electricity Consumers through “Electricity (Rights of Consumers) Rules, 2020”

Consumers across the country will now have the right to a minimum standard of service for supply of electricity. DISCOMs have to ensure minimum standard of service under the rules.

This will also include the right to round-the-clock electricity supplies, unless stated otherwise for a specific category, such as an agricultural connection.

These rules provide for rights of consumers and obligations of distribution licensees, release of new connection and modification in existing connection, metering arrangement, billing and payment, among others.

An automatic compensation mechanism will be put in place. It will include no supply to a consumer beyond a particular duration and certain number of interruptions in supply, which will be specified by the regulatory commission.

A new connection has to be given within a maximum time period of seven days in metro cities, 15 days in other municipal areas, and 30 days in rural areas.

The rules recognise consumer as a prosumer as well, where prosumers will maintain consumer status and have the same rights as a general consumer. They will also have right to set up renewable energy generation unit, including rooftop solar photovoltaic systems — either on their own or through a service provider.

Electricity is a concurrent subject and the Centre has the power to make rules that have to be enforced by all.

Hence, option (A) is the correct answer.

**QUESTION )** With reference to the Medium Range Surface to Air Missile (MRSAM), consider the following statements:

- (1) Army version of MRSAM is a surface to Air Missile developed jointly by DRDO, India and IAI, Israel for use of the Indian Army.
- (2) MRSAM Army weapon system comprises of Command post, Multi-Function Radar and Mobile Launcher system.

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

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

Answer: C

Defence Research and Development Organisation (DRDO) achieved a major milestone with the maiden launch of Medium Range Surface to Air Missile (MRSAM), Army Version from Integrated Test Range, Chandipur, off the Coast of Odisha around 1600 hrs.

The missile completely destroyed a high speed unmanned aerial target which was mimicking an aircraft with a direct hit.

Army version of MRSAM is a surface to Air Missile developed jointly by DRDO, India and IAI, Israel for use of the Indian Army.

MRSAM Army weapon system comprises of Command post, Multi-Function Radar and Mobile Launcher system.

Hence both statements are correct

**QUESTION )** With reference to the Merger of Five Film Media Units, consider the following statements:

(1) Union Cabinet has approved Merger of Five Film Media Units, namely Films Division, Directorate of Film Festivals, National Film Archives of India, and Children's Film Society, India with the National Film Development Corporation (NFDC) Ltd.

(2) National Film Development Corporation is a Central Public Sector Undertaking, incorporated in the year 1975.

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

Union Cabinet has approved Merger of Five Film Media Units, namely Films Division, Directorate of Film Festivals, National Film Archives of India, and Children's Film Society, India with the National Film Development Corporation (NFDC) Ltd.

The merger of Film Media Units under one corporation will lead to convergence of activities and resources and better coordination, thereby ensuring synergy and efficiency in achieving the mandate of each media unit.

Films Division, a subordinate office of M/o I&B, was established in 1948, primarily to produce documentaries and news magazines for publicity of Government programmes and cinematic record of Indian history.

Children's Film Society, India, an autonomous organisation, was founded in 1955 under the Societies Act with the specific objective of providing children and young people value-based entertainment through the medium of films.

National Film Archives of India, a subordinate office of M/o I&B, was established as a media unit in 1964 with the primary objective of acquiring and preserving Indian cinematic heritage.

Directorate of Film Festivals, as attached office of M/o I&B was set up in 1973 to promote Indian films and cultural exchange.

## EKLAVYA 360°PRELIMS PROGRAM – TEST 12 Explanation

NFDC is a Central Public Sector Undertaking, incorporated in the year 1975 with the primary object of planning and promoting an organized, efficient and integrated development of the Indian Film Industry.

The Union Cabinet also approved the appointment of a Transaction Advisor and Legal Advisor to advise on the transfer of assets and employees and to oversee all aspects of operationalization of the merger.

With more than 3000 films produced in a year, India is the largest film producer in the world with an industry led by the private sector.

Hence both statements are correct.

**QUESTION )** Consider the following statements regarding Hypersonic Technology Demonstrator Vehicle (HSTDV):

- (1) It is an unmanned scramjet demonstration aircraft that can travel at hypersonic speed.
- (2) It is indigenously developed by DRDO.
- (3) It can be used to launch satellites at low cost & will help add to India's ballistic missile defence capabilities.

Select the correct codes given below:

- (A) 1 and 2 only
- (B) 2 and 3 only
- (C) 1 and 3 only
- (D) 1, 2 and 3

Ans: (d) 1, 2 and 3

HSTDV is an unmanned scramjet demonstration aircraft.

HSTDV is dual-use technology and can have multiple civilian applications. It can be used for launching satellites at low cost and can also be available for long-range cruise missiles of the future.

DRDO recently conducted the maiden test of an indigenously developed Hypersonic Technology Demonstrator Vehicle (HSTDV).