PRELIMS TEST SERIES 2019

TEST 2 Answers- Geography,Current Affairs

PD GURUKUL

Learn India....Lead India

Detail Answers

1) C. 1, 2, 3 and 4

Answer Justification :

Xinjiang is a provincial-level autonomous region of China in the northwest of the country.
It is the largest Chinese administrative division and the eighth largest country subdivision in the world, spanning over 1.6 million km2.
Xinjiang contains the disputed territory of Aksai Chin, which is administered by China and claimed by Indi
Xinjiang borders the countries of Mongolia, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, Afghanistan, Pakistan Occupied Kashmir(POK) and India. The rugged Karakoram, Kunlun, and Tian Shan mountain ranges occupy much of Xinjiang's borders, as well as its western and southern regions.
Xinjiang also borders Tibet Autonomous Region and the provinces of Gansu and Qinghai. The most well-known route of the historical Silk Road ran through the territory from the east to its northwestern border.
In recent decades, abundant oil and mineral reserves have been found in Xinjiang, and it is currently China's largest natural gas-producing region.

2) B. 2 only

Answer Justification:

Statement 1: The three agreements — Logistics Support Agreement (LSA), Communications Interoperability and Security Memorandum of Agreement (CISMOA) and Basic Exchange and Cooperation Agreement for Geo-spatial Cooperation (BECA) are referred to as the foundational agreements which the U.S. signs with countries with which it has close military ties.
They are meant to build basic ground work and promote interoperability between militaries by creating common standards and systems. They also guide sale and transfer of high-end technologies.

LEMOA gives access, to both countries, to designated military facilities on either side for the

purpose of refuelling and replenishment. India and the U.S. already hold large number of joint exercises during which payments are done each time, which is a long and tedious process.
There will be no basing of the U.S. troops or assets on Indian soil. This is purely a logistical agreement.

Statement 2: Aggregate worth of defence acquisition from U.S. Defence has crossed over US$ 13 billion.
India and the United States have launched a Defence Technology and Trade Initiative (DTTI) aimed at simplifying technology transfer policies and exploring possibilities of co-development and co-production to invest the defence relationship with strategic value.
The DTTI Working Group and its Task Force will expeditiously evaluate and decide on unique projects and technologies which would have a transformative impact on bilateral defence relations and enhance India's defence industry and military capabilities.

3) D. 1, 2 and 3

Answer Justification:

The proposed regulations will prescribe the labeling requirements of pre-packaged foods and display of essential information on premises where food is manufactured, processed, served and stored.
The draft Regulation also states that HFSS (high in fat, sugar or salt) food products shall not be advertised to children in any form.
It also introduces labelling of genetically modified (GM) food.
Learning: The other key highlighted revisions of the draft regulations include:
The full revision of the "Nutritional Information" labeling requirement. There is a mention of food categories that do not require nutritional information labeling (unless a nutritional health claim is made on the label). An example of food falling under these categories are food which are single ingredient products (water, sugar, spices), non-nutritive products (coffee, tea, condiments), and packaged fresh produce;
Mandatory declaration requirements of principle display panel of the package or container: requires specific essential information to be declared on the Front of Package (FOP) of the packaged food (e.g. name of food, declaration regarding vegetarian or non-vegetarian, and nutritional information related to RDA (recommended dietary allowance));
Schedule IV of the regulations lays down the list of ingredients/additives in the prepackaged food that must be displayed with the "mandatory declaration" on the label, as well as the specific requirements/restrictions on methods of labeling certain types of foods (e.g. infant food, edible oil and fats, milk and milk products, GMOs, alcoholic beverages);
Declaration of food additives in reference to the Food Safety and Standards (Food Product Standards and Food Additives) Regulation 2011;
Specific requirements are established for food contact materials in non-retail containers and packaged food additives for retail sale; and
Certain exemptions such as labeling for small packages, food with a short shelf-life, and food

served for immediate consumption.

4) C. Kerala

Answer Justification:

Learning: Gujarat is third state in India to grant religious minority status to Jews after West Bengal and Maharashtra.
Jews there will get benefits of welfare schemes formulated for religious minority communities.
Six religious communities, viz. Muslims, Christians, Sikhs, Buddhists, Zoroastrians (Parsis) and Jains have been notified in Gazette of India as minority communities by Union Government all over India.
Constitution of India has not defined word 'Minority' and only refers to 'Minorities' but it speaks of those 'based on religion or language' and rights of minorities have been spelt out in Constitution in detail.

5) A. 1 only

Answer Justification:

Statement 1: The Gravity Recovery and Climate Experiment Follow-on (GRACE-FO) mission is a partnership between NASA and the German Research Centre for Geosciences (GFZ).

- GRACE-FO is a successor to the original GRACE mission, which began orbiting Earth on March 17, 2002. The GRACE missions measure variations in gravity over Earth's surface, producing a new map of the gravity field every 30 days.
- GRACE-FO will carry on the extremely successful work of its predecessor while testing a new technology designed to dramatically improve the already remarkable precision of its measurement system.
- GRACE-FO will continue the work of tracking Earth's water movement to monitor changes in underground water storage, the amount of water in large lakes and rivers, soil moisture, ice sheet and glaciers, and sea level caused by the addition of water to the ocean. These discoveries provid a unique view of Earth's climate and have far-reaching benefits to society and the world's population.

Statement 2: RAMA (Reconstituting Asteroids into Mechanical Automata) project has been designed to leverage the advancing trends of additive manufacturing (AM) and in-situ resource utilization (ISRU).
The project aims to enable asteroid rendezvous missions in which a set of technically simple robotic processes convert asteroid elements into very basic versions of spacecraft subsystems (GNC, Propulsion, Avionics).
Upon completion, the asteroid will be a programmed mechanical automata carrying out a given mission objective; such as relocation to an Earth-Moon liberation point for human rendezvous.

Significance:

- This technique could some day create an affordable and scalable way for NASA to achieve future roadmap items for exploring the solar system.
- These techniques could be beneficial to scientific goals for understanding the solar system and its formation, as it is estimated that an order of magnitude increase in NEO targets could be explored for the same mission cost compared to the SOA.
- RAMA would enable this by removing the need to launch all spacecraft subsystems and instead converting the asteroid material in-situ.

6) B. 2 only

Answer Justification :

Statement 1: This was in 2010. You need to remember the period because India and Russia have had a longstanding and time-tested partner. Such a status must have come for both countries a long time ago.
Since the signing of "Declaration on the India-Russia Strategic Partnership" in October 2000 (during the visit of Russian President H.E. Mr. Vladimir Putin to India), India-Russia ties have acquired a qualitatively new character with enhanced levels of cooperation in almost all areas of the bilatera relationship including political, security, trade and economy, defence, science and technology, and culture.

Statement 2: Under the Strategic Partnership, several institutionalized dialogue mechanisms operate at both political and official levels to ensure regular interaction and follow up on cooperation activities. During the visit of the Russian President to India in December 2010, the Strategic
Partnership was elevated to the level of a "Special and Privileged Strategic Partnership." Political Relations. Annual Summit between the Head of Government of both nations is the highest cooperative platform.

7) A. 1 only

Answer Justification :

It was established by the Government of India in 1955.
It falls under Ministry of Micro, Small & Medium Enterprises of India.
NSIC is the nodal office for several schemes of Ministry of MSME such as Performance & Credit Rating, Single Point Registration, MSME Databank, National SC ST Hub, etc.
NSIC operates through countrywide network of offices and Technical Centres in the Country.
Government of India to promote small and budding entrepreneurs of post independent India,

decided to establish a government agency which can mediate and provide help to small scale industries (SSI). As such they established National Small Industries Corporation with objectives to provide machinery on hire purchase basis and assisting and marketing in exports.

8) B. Sitting judge of the Supreme Court of India

Answer Justification :

Learning: NGT has been established under the National Green Tribunal Act 2010 for effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources.
The tribunal deals with matters relating to the enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property.
Sanctioned strength: currently, 10 expert members and 10 judicial members (although the act allows for up to 20 of each).

Selection: Members of the National Green Tribunal (NGT) are chosen by a selection committee (headed by a sitting judge of the Supreme Court of India) that reviews their applications and conducts interviews. The Judicial members are chosen from applicants who are serving or retired judges of High Courts.

Chairman: is the administrative head of the tribunal, also serves as a judicial member and is required to be a serving or retired Chief Justice of a High Court or a judge of the Supreme Court of India. Expert members are chosen from applicants who are either serving or retired bureaucrats not below the rank of an Additional Secretary to the Government of India (not below the rank of Principal Secretary if serving under a state government) with a minimum administrative experience of five years in dealing with environmental matters. Or, the expert members must have a doctorate in a related field

9) C. Article 21

Answer Justification :

Learning: Invoking Article 21 of the Constitution, the court said: “Article 21 of the Constitution, while safeguarding the rights of humans, protects life and the word ‘life’ means animal world”.
The court cited a 2014 Supreme Court judgment to say any disturbance from the “basic environment which includes all forms of life, including animals life, which are necessary for human life fall within the meaning of Article 21 of the Constitution”.
The move aims to ensure “greater welfare” of animals.
The entire animal kingdom, including avian and aquatic ones, are declared as legal entities having a distinct persona with corresponding rights, duties and liabilities of a living person.
A legal entity means an entity which acts like a natural person but only through a designated

person, whose acts are processed within the ambit of law. This means the animal kingdom could be represented by a custodian.

10) A. Sulphur

Answer Justification :

Background: The BS — or Bharat Stage — emission standards are norms instituted by the government to regulate the output of air pollutants from internal combustion engine equipment, including motor vehicles. India has been following the European (Euro) emission norms, though with a time-lag of five years.
ICAT has completed the first BS-VI certification for a heavy-duty engine model for M/s Volvo Eicher Commercial Vehicle Limited.
The International Centre for Automotive Technology (ICAT) is a division of NATRiP implementation society (NATIS), under the administrative control of the Ministry of Heavy Industries & Public Enterprises, Government of India.
Justification: The newly introduced fuel is estimated to reduce the amount of sulphur released by 80%, from 50 parts per million to 10 ppm. As per the analysts, the emission of NOx (nitrogen oxides) from diesel cars is also expected to reduce by nearly 70% and 25% from cars with petrol engines.

11) A. It is a celestial body that is accelerating particles to high energies some of which may reach the earth as cosmic rays

Answer Justification :

Learning: It is the most luminous and massive stellar system within 10,000 light-years from earth.
It is located about 7,500 light-years away in the southern constellation of Carina.
It is famous for a 19th century outburst that briefly made it the second-brightest star in the sky.
It is accelerating particles to high energies some of which may reach the earth as cosmic rays.
Option B and D: Betelgeuse (alpha Orionis) is the second-brightest star in the constellation Orion and one of the brightest stars in the sky.
It is a supergiant star, reddish in color, and over 600 million miles in diameter (almost 1,000 times bigger than the Sun but cooler than the Sun). Betelgeuse is about 14,000 times brighter than the Sun.
If Betelgeuse were at the center of our Solar System, it would extend beyond the orbit of Jupiter. It is 52 light-years from Earth. It is a variable star, varying in magnitude from 0.3 to 1.2 over a period of about 7 years, averaging about 0.70.

12) C. 1 and 2 only

Answer Justification :

Background: NHPS is a new Centrally Sponsored mission having central sector component under Ayushman Bharat Mission anchored in the MoHFW.

The scheme has the benefit cover of Rs. 5 lakh per family per year. The target beneficiaries of the proposed scheme will be more than 10 crore families belonging to poor and vulnerable population based on SECC database.

AB-NHPM will subsume the on-going centrally sponsored schemes –Rashtriya Swasthya Bima Yojana (RSBY) and the Senior Citizen Health Insurance Scheme (SCHIS).

Justification: Statement 1: Benefits of the scheme are portable across the country and a beneficiary covered under the scheme will be allowed to take cashless benefits from any public/private empanelled hospitals across the country.

Statement 2 and 3: The benefit cover will also include pre and post-hospitalisation expenses. All pre-existing conditions will be covered from day one of the policy. A defined transport allowance per hospitalization will also be paid to the beneficiary.

Statement 4: This cover will take care of almost all secondary care and most of tertiary care procedures

Statement 5: To ensure that nobody is left out (especially women, children and elderly) there will be no cap on family size and age in the scheme.

Statement 6: AB-NHPM will be an entitlement based scheme with entitlement decided on the basis of deprivation criteria in the SECC database.

The different categories in rural area include families having only one room with kucha walls and kucha roof; families having no adult member between age 16 to 59; female headed households with no adult male member between age 16 to 59; disabled member and no able bodied adult member in the family; SC/ST households; and landless households deriving major part of their income from manual casual labour.

Learning: To control costs, the payments for treatment will be done on package rate (to be defined by the Government in advance) basis.

The package rates will include all the costs associated with treatment. For beneficiaries, it will be a cashless, paper less transaction. Keeping in view the State specific requirements, States/ UTs will have the flexibility to modify these rates within a limited bandwidth.

One of the core principles of AB-NHPM is to co-operative federalism and flexibility to states. There is provision to partner the States through co-alliance.

This will ensure appropriate integration with the existing health insurance/ protection schemes of various Central Ministries/Departments and State Governments (at their own cost), State Governments will be allowed to expand AB-NHPM both horizontally and vertically.

States will be free to choose the modalities for implementation. They can implement through insurance company or directly through Trust/ Society or a mixed model.

For giving policy directions and fostering coordination between Centre and States, it is proposed to set up Ayushman Bharat National Health Protection Mission Council (AB-NHPMC) at apex level Chaired by Union Health and Family Welfare Minister.

Additional background: In-patient hospitalization expenditure in India has increased nearly 300% during last ten years. (NSSO 2015).

More than 80% of the expenditure are met by out of pocket (OOP). Rural households primarily depended on their 'household income / savings' (68%) and on 'borrowings' (25%), the urban households relied much more on their 'income / saving' (75%) for financing expenditure on hospitalizations, and on '(18%) borrowings. (NSSO 2015).

Out of pocket (OOP) expenditure in India is over 60% which leads to nearly 6 million families getting into poverty due to catastrophic health expenditures.

AB-NHPM will have major impact on reduction of Out Of Pocket (OOP) expenditure on ground of:

Increased benefit cover to nearly 40% of the population, (the poorest & the vulnerable)

Covering almost all secondary and many tertiary hospitalizations (except a negative list)

Coverage of 5 lakh for each family, (no restriction of family size)

13) C. 3 only

Answer Justification :

Justification: Government recently declared 6 educational 'Institutions of Eminence'; 3 Institutions fro Public Sector and 3 from Private Sector shortlisted.
Each 'Public Institution' selected as 'Institution of Eminence' will get financial assistance up to Rs. 100 Crore over a period of five years.
These Institutions shall be provided with greater autonomy to admit foreign students up to 30% of admitted students; to recruit foreign faculty upto 25% of faculty strength; to offer online courses upto 20% of its programmes.
They will also be allowed to enter into academic collaboration with top 500 in the world ranking Institutions without permission of UGC; free to fix and charge fees from foreign students without restriction; complete flexibility in fixing of curriculum and syllabus, among others.
At the same time, they will get more opportunity to scale up their operations with more skills and quality improvement so that they become World Class Institutions in the field of education.

14) C. 1 only

Answer Justification :

Justification: DIPP, Ministry of Commerce and Industry in collaboration with the World Bank conducted an annual reform exercise for all States and UTs under the Business Reform Action Plan (BRAP).

The aim of this exercise is to improve delivery of various Central Government regulatory functions and services in an efficient, effective and transparent manner.

The reform plan includes 372 recommendations for reforms on regulatory processes, policies, practices and procedures spread across 12 reform areas including labour regulation enablers; contract enforcement; registering property; inspection reform enablers; single window system; land availability and allotment; construction permit enablers etc.

BRAP 2017 includes two new sectors i.e. Healthcare and Hospitality.

Performance of states:

- The top rankers are Andhra Pradesh, Telangana and Haryana. Jharkhand and Gujarat stood fourth and fifth respectively.
- Delhi is placed at 23rd among 34 states and Union territories. Its rank also worsened from18th in 2016.
- Karnataka has occupied the eighth spot, against 13th in 2016.

15) C. Both 1 and 2

Answer Justification :

Justification: Statement 1: In 1971 Professor V.K.R.V. Rao, the then Minister of Education/Ministr of Human Resource Development (Government of India) and Chairman of the Central Sanskrit Board, planned the First International Sanskrit Conference.

- The two themes he suggested for the proposed Sanskrit Conference were the contribution of the various regions of the world to Sanskrit Studies and the contribution of Sanskrit to the advancement of knowledge in different regions of the world. This first Conference had to be postponed to 1972.
- At the 29th International Congress of Orientalists, held in Paris in 1973, Sanskritists from various countries endorsed the formation of the International Association of Sanskrit Studies and drafted its constitution.
- The main task of the IASS was agreed to be the organizing of a World Sanskrit Conference at different venues around the world.
- Members of the IASS are registered on an individual basis by paying a membership fee, either directly to the IASS (see "Download Membership Form" below), or through their membership of a national association that is a affiliated to the IASS.

- The 1972 International Sanskrit Conference in New Delhi was recognised retrospectively as the First World Sanskrit Conference.

Statement 2: By the middle of the 1970s workers in the field of Buddhist studies were experiencing more and more urgently the acute need for an international academic organisation wholly dedicated t the pursuit and furtherance of the study of Buddhism in one or several of its many aspects.

IABS With this end in view, a small meeting was convenced in 1976 by two scholars who were leading historians of ancient India, professor A. L. Basham and A. K. Narain, and it was agreed by those present that a learned society having this purpose should be founded.

The first organised conference of the International Association of Buddhist Studies (IABS) was then held on 15-17 September 1978 under the auspices of Columbia University (New York).

16) C. 2 only

Answer Justification :

Justification: Statement 1: Formaldehyde, in its basic form, is a gas. Most people think of formaldehyde as a liquid. The liquid is actually a mixture of formaldehyde gas and water. The most common concentration used is a 37% solution.

- To prevent polymerization of formaldehyde solution, about 10 - 15% of methyl alcohol is added. It is the addition of methyl alcohol that causes the substance to be called formalin as opposed to formaldehyde.
- Formalin is a toxic, colourless solution that is derived by dissolving formaldehyde gas in water.
- It is a cancer-inducing chemical used to preserve fish is used as a disinfectant. It is used in the manufacture of pesticides, fertilisers, glue, paper and paint, among other products.
- Formalin causes irritation in the eyes, throat, skin and stomach. In the long run continued exposure causes harm to the kidneys, liver and can even cause cancers.

Statement 2: Fish samples in Chennai test positive for formalin. This is the first time samples of fish in Tamil Nadu have tested positive for toxic formalin.
This is because Formalternate can be disposed of via the sanitary sewer system. But, formalin must be disposed though the hazardous chemical waste disposal program because it is toxic.
Formalternate can be used in lieu of formaldehyde in the storage (NOT FIXATION) of biological specimens.
Statement 3: Formaldehyde is a highly reactive, flammable gas, which means it can become a fire hazard when exposed to flame or heat.
Formaldehyde solutions can be flammable when there are high concentrations of formaldehyde or methanol.

17) B. 1, 2 and 3

Answer Justification :

Justification: DNA profiling (also called DNA fingerprinting) is the process of determining an individual's DNA characteristics, which are as unique as fingerprints. DNA analysis intended to identify a species, rather than an individual, is called DNA barcoding.

information from DNA samples can reveal not just how a person looks, or what their eye colour or skin colour is, but also more intrusive information like their allergies, or susceptibility to diseases. As a result, there is a greater risk of information from DNA analysis getting misused.

DNA profiling is commonly used as a forensic technique in criminal investigations, for example comparing one or more individuals' profiles to DNA found at a crime scene so as to assess the likelihood of their involvement in the crime.

It is also used in parentage testing, to establish immigration eligibility (based on their family lineage), and in genealogical and medical research. DNA profiling has also been used in the study of animal and plant populations in the fields of zoology, botany, and agriculture.

18) C. 2, 3 and 4 only

Answer Justification :

Justification and Learning: Species already included in the recovery programme: Snow Leopard, Bustard (including Floricans), Dolphin, Hangul, Nilgiri Tahr, Marine Turtles, Dugongs, Edible Nest Swiftlet, Asian Wild Buffalo, Nicobar Megapode, Manipur Brow-antlered Deer, Vultures, Malabar Civet, Indian Rhinoceros, Asiatic Lion, Swamp Deer and Jerdon's Courser.

The species recovery programme of the Union Environment Ministry is implemented under Integrated Development of Wildlife Habitats — a centrally sponsored umbrella scheme for management and conservation of parks, wildlife habitats and conservation.

Started in 2008-09, IDWH is meant for providing support to protected areas (national parks, wildlife sanctuaries, conservation reserves and community reserves except tiger reserves), protection of wildlife outside protected areas and recovery programmes for saving critically endangered species and habitats.

National Board for Wildlife (NBWL) recently added four species into the center's recovery Programme for critically endangered species - Northern River Terrapin, Clouded Leopard, Arabian Sea Humpback Whale and Red Panda.

This decision will lead to targeted conservation of these species whose population is on the decline.

19) C. Both 1 and 2

Answer Justification :

Justification: It is the first major agreement of the post-2015 development agenda, with seven targets an four priorities for action.

It was endorsed by the UN General Assembly following the 2015 Third UN World Conference on Disaster Risk Reduction (WCDRR).

The Framework is for 15-year. It is a voluntary and non-binding agreement which recognizes that the State has the primary role to reduce disaster risk but that responsibility should be shared with other stakeholders including local government, the private sector and other stakeholders.

The new Framework is the successor instrument to the Hyogo Framework for Action (HFA) 2005-2015 Building the Resilience of Nations and Communities to Disasters.

20) A. Future space manned missions

Answer Justification :

Learning: PAT (pad abort test) is the first in a series of tests to qualify a crew escape system technology of a manned mission in the future.

Crew Escape System is an emergency escape measure to quickly pull the astronaut cabin along with cre out to a safe distance from launch vehicle during a launch abort.

ISRO recently conducted the first 'pad abort' test critical for a future human space mission. The Pad Abort Test demonstrated the safe recovery of the crew module in case of any exigency at the launch pad

21) B. Switzerland

Answer Justification :

View the EU Map.

22) A. Rotational velocity of the Moon

Answer Justification :

Justification: The moon moves around the earth in about 27 days. It takes exactly the same time to complete one spin. As a result, only one side of the moon is visible to us on the earth.

Option B: Even if the earth was not tilted, you would be able to see only one side of the moon. The geoid shape of earth has nothing to do with our view of the Moon. Even if the earth were to become slightly flatter or rounder, the sight of the moon won't change much.

23) C. 1 only

Answer Justification :

Justification: The motions of the liquid iron and nickel outer core of the earth are thought to create the earth's magnetic field. This magnetic field resembles a dipole as if a giant bar magnet was embedded inside.

S1 and 2: However, the axis of the dipole is not aligned with the rotational axis of the earth. Neither is i centered in the earth. The magnetic dipole axis of the earth is tilted about 11½° from the rotation axis.

The magnetic poles of the earth are defined as the location of the strongest vertical magnetic field.

This places the magnetic north pole just west of northern Greenland (about N80° W70°) and the magnetic south pole near the coast of Antarctica south of Australia (about S75° E150°), as the following diagram shows.

S3: The magnetic equator is defined as the line around the earth where the magnetic field is horizontal, or parallel to the earth's surface. It does not circle the earth as a smooth line like the geographic equator, but instead it meanders north and south, as shown.

Magnetic field lines of the earth enter the north geographic pole and exit the south geographic pole, as the following diagram indicates. So as the earth turns, its magnetic dipole axis wobbles around the rotational axis.

S4: The magnetic dipole of the earth is not centered on the earth's core, but instead is offset by about 700 kilometers towards the direction of southeastern Asia. This creates two features in the magnetic field at the earth's surface.

24) A. A is correct, and R is an appropriate explanation of A.

Answer Justification :

Justification: If certain organisms became extinct at a time, say due to severe drought or interglacial shifts, this is recorded in sedimentary fossils as an event of a mass disappearance. Scientists can predict collapse of certain species due to climate change this way.

Based on the above reasoning, sedimentary rocks will contain record of oceanic environments or glacial environments or deserts.

This information can be decoded by studying various layers of sedimentary rocks and their arrangement in layers deep down the crust.

25) A. 1 only

Answer Justification :

Justification: In the beginning, all matter forming the universe existed in one place in the form of a "tiny ball" (singular atom) with an unimaginably small volume, infinite temperature and infinite density.

- At the Big Bang the "tiny ball" exploded violently. This led to a huge expansion. It is now generally accepted that the event of big bang took place 13.7 billion years before the present. The expansion continues even to the present day. As it grew, some energy was converted into matter. Therefore, A is correct.

- Within 300,000 years from the Big Bang, temperature dropped to 4,500 K and gave rise to atomic matter. The universe became transparent. So, S2 is wrong. The actual reason for expansion of Universe has not been fully established by the science community even till date.

26) A. 3 only

Answer Justification :

Justification: Statement 1: Infant Mortality Rate has declined from 58 per 1,000 live births in 2005 to 37 per 1,000 live births in 2015, which is a decline of 21 points (36.2 per cent).

Statement 2: Maternal Mortality Rate: it was 254 per 1,00,000 live births in 2004-05, which hasbeen reduced to 167 per 1,00,000 live births in 2013. It has decreased by 87 points (34.2 per cent).
Statement 3: U5MR is around 26.

27) C. Norway

Answer Justification :

Learning: Norway has the second longest coastline in the World, and the longest in Europe.

With 202,080 km of coastline, Canada is also the country with largest water area in the world, and th second largest country in the world.

However, based on different estimates, rankings vary.

28) A. 1 Only

Answer Justification :

Justification: The mid-day sun is exactly overhead at least once a year on all latitudes in between th Tropic of Cancer and the Tropic of Capricorn. This area, therefore, receives the maximum heat and i called the Torrid Zone.
The mid-day sun never shines overhead on any latitude beyond the Tropic of Cancer and the Tropic of Capricorn. The angle of the sun's rays goes on decreasing towards the poles.
Every longitude starts from a pole and meets the other pole. It is latitude that matters in distribution of solar insolation, not the longitude.

29) B. 1 and 3 only

Answer Justification :

Justification: The Arctic Ocean is located within the Arctic Circle and surrounds the North Pole. It i connected with the Pacific Ocean by a narrow stretch of shallow water known as berring strait.

The International Date Line runs around the Bering strait.

This strait separates the United States and Russia by around 85 km, with a water depth that measures only 30–50 meters!

In the last few decades some factions have discussed the construction of a bridge over the strait, however, financial and weather concerns have continually stalled the project.

30) D. None

Answer Justification :

Justification: From south to north, India extends between 8°4'N and 37°6'N latitudes. From west to east, India extends between 68°7'E and 97°25'E longitudes.

So, the north-south extent from Kashmir to Kanyakumari is about 3,200 km. And the east-west extent from Arunachal Pradesh to Kuchchh is about 2,900 km.

31) A. 1 Only

Answer Justification :

Justification: A comet tail—and coma—are features visible in comets when they are illuminated by the Sun and may become visible from Earth when a comet passes through the inner Solar System.

As a comet approaches the inner Solar System, solar radiation causes the volatile materials within the comet to vaporize and stream out of the nucleus, carrying dust away with them. Separate tails are formed of dust and gases, becoming visible through different phenomena; the dust reflects sunlight directly and the gases glow from ionisation. So, 1 is correct.

Statement 2: In the outer Solar System, comets remain frozen and are extremely difficult or impossible to detect from Earth due to their small size.

As they get closer to the Sun, ice starts to melt and the glow increases. So, 2 is wrong.

32) B. East European Plain

Answer Justification:

Learning: Go through EU Map

33) A. 1, 2 and 3 only

Answer Justification:

Justification: The South China sea carries tremendous strategic importance; one-third of the world's shipping passes through it carrying over $3 trillion in trade each year, it contains lucrative fisheries that are crucial for the food security of millions in Southeast Asia, and huge oil and gas reserves are believed to lie beneath its seabed.

These nations are Brunei, the People's Republic of China (PRC), Republic of China (Taiwan), Malaysia, Indonesia, the Philippines, and Vietnam.

The disputes include the islands, reefs, banks, and other features of the South China Sea, including th Spratly Islands, Paracel Islands, and various boundaries in the Gulf of Tonkin. There are further disputes, including the waters near the Indonesian Natuna Islands, which many do not regard as part of the South China Sea.

Claimant states are interested in retaining or acquiring the rights to fishing areas, the exploration and potential exploitation of crude oil and natural gas in the seabed of various parts of the South China Sea, and the strategic control of important shipping lanes.

To promote this, several states, including the United States, conduct "freedom of navigation" operations.

34) A. 1 only

Answer Justification :

Justification: Statement 1: The image below explains statement 1. Notice how on Summer equinox, Tropic of Cancer receives direct overhead rays of the Sun, while in Winter solstice, it is the Tropic o Capricorn.

On an equinox, when days and nights are equal in duration, Sun is directly overhead the equator, causing equal days and nights.

35) B. Icy dust, large rocks and moons of the planets

Answer Justification :

Learning: The composition of ring particles varies; they may be silicate or icy dust. Larger rocks an boulders may also be present. Sometimes rings will have small moons that orbit near the inner or outer edges of rings or within gaps in the rings.

For e.g. the ring swirling around Saturn consists of chunks of ice and dust.

Recent evidence suggests that ring systems may be found around other types of astronomical objects including minor planets, moons, and brown dwarfs.

36) D. None

Answer Justification :

Justification: Statement 1: It is the case presently when earth rotates from west to east. If the opposite happens, places west of Greenwich will be ahead in time and places east will lag behind in time.

Statement 2: Time varies across a longitude, not latitude.

For e.g. when the Prime Meridian of Greenwich has the sun at the highest point in the sky, all the places along this meridian will have mid-day or noon, whether the place is southwards or northwards

This is independent of the direction of rotation of the earth. So, 2 is incorrect.

37) B. Ural Mountains

Answer Justification :

Justification: Statement 1: The diagram below shows it.

38) C. Both 1 and 2

Answer Justification :

Justification: Statement 1: A shield volcano on Mars, Olympus Mons, is the largest volcano in the Solar System.

- It is three times taller than Mount Everest and about five hundred km in diameter.
- The surface of Venus is dominated by volcanic features and has more volcanoes than any other planet in the Solar System.
- Mercury is quiter as compared to these two planets, but volcanoes do exist on it.

Statement 2: There is evidence for the existence of ice, as well as water, on the surface of planets other than earth.

- In 2012, NASA's Messenger confirmed the discovery of ice in permanently shadowed craters near Mercury planet's North pole.
- Astronomers have detected that the atmosphere of Venus as well as of Mars contains water vapour.
- But, there isn't any water on the surface of Venus, in form of rivers, lakes or oceans.

39) B. 1 and 3

Answer Justification:

Justification: Geoglogy of India can be categorized in following eras, in increasing chronological order.

- Precambrian super-eon
- Phanerozoic
    1. Palaeozoic
    2. Lower Paleozoic
    3. Upper Paleozoic
- Mesozoic
- Cenozoic
    1. Tertiary period
    2. Quaternary period

Option (c): The alluvium which is found in the Indo-Gangetic plain belongs to the Quaternary perio It was eroded from the Himalayas by the rivers and the monsoons. Since Himalayas were formed aft Deccan traps, and are very young, (c) can't be the answer.

The Deccan plateau in India is one of the oldest plateaus in India made mainly from igneous rocks.

40) B. China

Answer Justification :

Learning: As the most populous country in the world and third largest in area, China also has the largest number of neighbours (14) sharing its 22,000km land borders namely: North Korea, Russia, Mongolia, Kazakhstan, Kyrgyzstan, Tajikistan, Afghanistan, Pakistan, India, Nepal, Bhutan, Myanmar, Laos and Vietnam.

Brazil shares its borders with 10 nations, almost all of them in South America.

41) A. 1 only

Answer Justification :

Justification: Statement 1: Frictional heating is caused by denser core material sinking to the center o the planet caused due to gravitation.

As material slides against each other, heat generated is retained deep within the earth and temperatur remains high.

Statement 2: It is estimated that about 50% of the heat given off by the Earth is generated by the radioactive decay of elements such as uranium and thorium, and their decay products.

Further discussion becomes technical and is outside the purview of our syllabus.

42) B. 2 only

Answer Justification :

Justification: **Statement 1:** It can be easily discarded. Jovian planets (Jupiter, Saturn etc) are bigger in size than terrestrial planets (earth, Venus etc).

Statement 2: Gravity of a planet depends on its mass and size. Since the terrestrial planets were small, gravity force was less and it could not keep the gases in tact with the planet. Hence, gases escaped causing loss of atmosphere.

The terrestrial planets were formed in the close vicinity of the parent star where it was too warm for gases to condense to solid particles. Moreover, the solar wind was most intense nearer the sun; so, it blew off lots of gas and dust from the terrestrial planets causing loss of atmosphere.

43) A. 1, 3 and 4 only

Answer Justification:

Please go through EU MAP

44) B. Madhya Pradesh

Answer Justification :

Justification and Learning: Option A: Delhi does not have a happiness department or happiness Index. It has introduced Happiness curriculum in schools though recently.

The curriculum involves a "happiness period" of 45 minutes and five minutes of meditation before each class. It will include meditation, moral values and mental exercises.

Option B: Madhya Pradesh, which is in the process of developing a happiness index to find out how happy its population is, has decided to introduce on pilot basis happiness-based activities in 10 schools, five each in Bhopal and Jabalpur. Keeping the emotional needs of students in mind, an effor will be made to develop their personalities to help them lead a meaningful life.

After the idea of a happiness department was floated by the MP Chief Minister in 2017, the state government signed an MoU with IIT Kharagpur to assess and develop the Happiness index.

The 14 domains were arrived at after reviewing global, country and city indices with which happines is associated while the sub-domains and their indicators were chosen after study of various reports or the basis of ground realities that emerged from primary unstructured and domain-specific interviews with 600 respondents from 10 districts of the state.

45) C. English Channel

Answer Justification :

Justification: The English Channel is the body of water that separates southern England from northern France and links the southern part of the North Sea to the Atlantic Ocean. It is the busiest shipping area in the world.

It is about 560 km long and is the smallest of the shallow seas around the continental shelf of Europe

46) A. 2 and 3 only

Answer Justification :

Justification & Learning: The crust overlies the solidified and uppermost layer of the mantle.

Oceanic crust is the result of erupted mantle material originating from below the plate, cooled and in most instances, modified chemically by seawater.

It is primarily composed of mafic rocks, or sima, which is rich in iron and magnesium.

It is thinner than continental crust, or sial, generally less than ten km thick; however Oceanic crust is denser. So, both A and R are incorrect.

47) D. 1, 2, 3 and 4

Justification: Statement 1: It causes plate movements (tectonics), results in volcanic eruptions and therefore a significant factor in the evolution of landforms on earth.

Statement 2: If Vegetation cover is high, it protects the surface from rain splash as root mass is sufficient to stabilize the materials on the slope.

Even surface runoff become less effective in carving out landforms in areas where there is dense vegetation, since there is little scope for soil erosion.

Statement 3: Self-explanatory. For e.g. all the plains that you are the result of active erosion and deposition by water.

Statement 4: When water freezes to ice, its volume increases. Under specific circumstances, this expansion is able to displace or fracture rocks where water exist in its pores. Repeated frost action thus weathers (breaks) the rocks.

- In some mountains, there are permanently frozen rivers of ice. They are called glaciers. Glaciers move at a very slow rate. When they do, they erode the soil beneath them.
- Also, formation of glaciers and their retreat affects the soil profile of the region and thus the landforms.

48) C. Norway

Answer Justification :

Learning: Norway has the second longest coastline in the World, and the longest in Europe.

With 202,080 km of coastline, Canada is also the country with largest water area in the world, and th second largest country in the world.

49) A 1 only

Explanation :-

2nd statement is wrong
Imaginary line running on the globe divides it into two equal parts. This line is known as the equator The northern half of the earth is known as the Northern Hemisphere and the southern half is known a the Southern Hemisphere . They are both equal halves. Therefore, the equator is an imaginary circula line and is a very important reference point to locate places on the earth.

All parallel circles from the equator up to the poles are called parallels of latitudes. Latitudes are measured in degrees.
The equator represents the zero degree latitude.

50) A 48 minutes ahead of Greenwich time

As the earth rotates from west to east, those places east of Greenwich will be ahead of Greenwich Time and those to the west will be behind it.
The rate of difference can be calculated as follows.
The earth rotates 360° in about 24 hours, which means 15° an hour or 1° in four minutes. Thus, when it is 12 noon at Greenwich, the time at 15° east of Greenwich will be 15*4 = 60 minutes, i.e., 1 hour ahead of Greenwich Time, which means 1 p.m.
But at 15° west of Greenwich, the time will be behind Greenwich time by one hour, i.e., it will be 11.00 a.m. Similarly, at 180°, it will be midnight when it is 12 noon at Greenwich.
In the question, it is asked for 12° east of Greenwich Time, so answer will be 48 minutes ahead of Greenwich Time.

51) B 1 and 2 only

- Big Bang Theory or the expanding earth theory given by Edwin Hubble. According to it, in the beginning, all matters forming the universe existed in one place in form of a "tiny ball" with an unimaginable small volume, infinite temperature and infinite density. At the Big Bang, that took place 13.7 billion years before the present, the "tiny ball" exploded and thereafter the universe continues to expand. This is the most widely accepted theory. Hence, option 1 is correct.
- The Steady-state theory was first put forward in 1948 by British scientists Sir Hermann Bondi, Thomas Gold, and Sir Fred Hoyle as an alternative to the big-bang hypothesis. According to it, the universe is always expanding but maintaining a constant average density, with matter being continuously created to form new stars and galaxies at the same rate that old ones become unobservable as a consequence of their increasing distance and velocity of recession. A steady-state universe has no beginning or end in time, and from any point within it the view on the grand scale—i.e., the average density and arrangement of galaxies—is the same. Galaxies of all possible ages are intermingled. Hence, option 2 is correct.
- The Big Splat Theory: It is related to the formation of Moon as a satellite to earth. According to it, a body of the size one to three times that of Mars collided into the Earth sometimes shortly after earth was formed. It blasted a large part of the earth into space. This continued to orbit around the earth and eventually formed the present moon around 4.44 billion years ago. Hence, option 3 is not correct.

52) C 2 only

- Statement 1 is not correct: All planets orbit around the sun in a counter-clockwise direction, except for Uranus and Venus which rotate in clockwise direction.

- Statement 2 is correct: Earth has the highest density with density of 5.517 gm/cm3. Second highest is Mercury with density of 5.44 gm/cm3.
- Statement 3 is not correct: All planets, except Mercury and Venus, have atleast one natural satellite. Like Earth has one, Mars has two, Jupiter has 16 and so on.
- Other Information about Solar system:
- Jupiter is the largest planet by size.
- All planets have density above density of water (1 gm/cm3), except Saturn (0.7 gm/cm3). So if Satur is placed in a very large pool of water, it will float, while all other planets will sink.

53) D 1, 2 and 3

- The Earth revolves around the Sun on an elliptical path at speed of 18.5 miles per second or 66,600 miles per hour. One complete revolution takes 365.25 days.
- The axis of the earth is inclined to the plane of the ecliptic (plane on which the earth orbits the sun) a an angle of 66.5 degree. Due to this inclination, as the earth revolves around the sun, the sun's overhead/ midday position keeps oscillating between the Tropic of Cancer and Tropic of Capricorn. This leads to variation in length of day and night. Like on Equinoxes, all parts of earth will have equa days and nights, while in summer solstice, the northern hemisphere will have its longest day and shortest night. Hence, **statement 1 and 2 are correct.**
- Earth revolves around the sun in elliptical path, due to this the relative distance between sun and earthkeeps on changing. This, along with other factors like cloudiness, variation is solar flare intensit etc, impacts the solar insolation (amount of solar radiation incident on the earth's surface). Like at Perihelion (when the Earth is closest to Sun) the solar insolation is higher compared to Aphelion (when Earth is farthest from Sun). Hence, statement 3 is correct.

54) C Both 1 and 2

- The brief period between sunrise and full daylight is called Dawn and that between sunset and complete darkness is called Twilight.
- It takes place when the earth receives diffused or refracted light from the sun whilst it is still below the horizon. Hence, statement 1 is correct.
- The time duration is directly related to the obliquity of the sun's rays. Like, at poles where the sun's rays have a highly oblique path, the time duration of dawn and twilight is largest. While at the equator, where the sun's rays are almost vertical, the time duration is small. This is due to the fact tha with increase in obliquity, the period of refracted light increases. Hence, **statement 2 is correct.**

55) C 2-1-3

- The earth was initially a barren, rocky, and hot object with a thin atmosphere of hydrogen and heliun The earth evolved as a layered structure due to density differentiation, that is, heavier materials sank

towards the centre and lighter ones moved towards surface, forming layers like Crust, Mantle, Outer Core and Inner Core.

- The atmosphere also evolved from a thin atmosphere of hydrogen and helium to the present form wit abundance of nitrogen and oxygen. It occurred in three phases (in sequence):
    - Loss of primordial atmosphere: The early atmosphere, with Hydrogen and Helium, is supposed to have been stripped of as a result of solar winds.
    - Degassing: During the cooling of the Earth, the gases were outpoured from the interior of the earth such as Carbon Dioxide, Methane, Ammonia etc.
    - Modification by Photosynthesis which added Oxygen to the atmosphere.

56) B. full moon day

- A lunar eclipse can occur only at full moon. A total lunar eclipse can happen only when the sun, Eart and moon are perfectly lined up — anything less than perfection creates a partial lunar eclipse or no eclipse at all.
- Because the moon's orbit around Earth lies in a slightly different plane than Earth's orbit around the sun, perfect alignment for an eclipse doesn't occur at every full moon.

57) B. 2020

- A "Leap" Day is an extra day on February 29 which is added nearly every 4 years to today's Gregorian calendar.
- Here are the rules for leap year, just to set the record straight.
- A year is a leap year if it is divisible by 4, but century years are not leap years unless they are divisible by 400.
- So, the years 1700, 1800, and 1900 were not leap years, but the year 2000 was.

58) C 1 and 3

Igneous Rocks

Igneous rocks are the oldest type of rocks on the earth. All the other types of rocks are formed from igneous rocks. Igneous rocks are formed when magma (molten materials) rise from the earth's interior. Igneous rocks can be sub classified further according to their depth of formation. The rocks that form below the earth surface are called as intrusive igneous rocks, and rocks that form on the earth surface ar called extrusive igneous rocks (volcanic rocks). These rocks contain silica 40% to 80%. Magnesium and iron are important among others. Granite, pegmatite, gabbro, dolerite, and basalt are some examples fo igneous rocks.

Metamorphic Rocks

Metamorphic rocks are formed due to metamorphism from existing igneous or sedimentary rocks, or even from existing metamorphic rocks. When existing rocks undergo changes due to high pressure and/or high temperature and/or high shearing stresses, metamorphic rocks are formed. Usually metamorphic rocks are formed deep in the earth. Heat comes from magma, while pressure comes from the layer of rocks on top of the other layers. Metamorphic rocks are classified based on foliation as foliated rocks and non-foliated rocks. Foliation means the existence of series of parallel surface. These rocks usually contain crystal. Gneiss, slate, marble, and quartzite are some of the metamorphic rocks.

What is the difference between Igneous Rocks and Metamorphic Rocks?

- Igneous rocks are the oldest rocks, while metamorphic are being derivative of igneous rocks and sedimentary rocks.
- Igneous rocks are the major proportion (nearly 95%) of the total rocks, while metamorphic rocks are found in a very small percentage.
- Igneous rocks are made up of two or more minerals, while metamorphic rocks are usually made u of only one mineral.
- Igneous rocks have no fossils, while, metamorphic rocks rarely have fossils.
- Metamorphic rocks are harder than igneous rocks.
- Resistance to weathering and erosion is less to metamorphic rocks compared to igneous rocks.
- Tendency to react with acids is higher to metamorphic rocks when compared to igneous rocks.

59) C. Fe in the core

Earth's magnetic field , also known as the geomagnetic field , is the magnetic field that extends from the Earth's interior to where it meets the solar wind, a stream of charged particles emanating from the Sun. Its magnitude at the Earth's surface ranges from 25 to 65 microteslas (0.25 to 0.65 gauss).

Roughly speaking it is the field of a magnetic dipole currently tilted at an angle of about 10 degrees with respect to Earth's rotational axis, as if there were a bar magnet placed at that angle at the center of the Earth.

Unlike a bar magnet, however, Earth's magnetic field changes over time because it is generated by a geo dynamo (in Earth's case, the motion of molten iron alloys in its outer core).

60) D Sun, 8 planets, satellites, asteroids and meteoroids

The sun, eight planets, satellites and some other celestial bodies known as asteroids and meteoroids form the solar system. It also includes comets. We often call it a solar family, with the sun as its Head.

Note- Pluto is not a planet now. It is declared as dwarf planet.

Pluto is a dwarf planet. A dwarf planet travels around, or orbits, the sun just like other planets. But it is much smaller.

Do you know?

- Pluto is very, very cold. It is much colder than Antarctica. It is so cold that Earth's air would freez into a kind of snow there.
- Pluto has less gravity than Earth. This means a person would weigh much less on Pluto than on Earth.

THINK!

- Dwarf planet
- Kuiper belt

61) D All of the above

Statement 1 – tropic of cancer (23½ °) lies in northern hemisphere.

Statement 2 – tropic of Capricorn (23½ °) lies in southern hemisphere.

Torrid Zone –

- Lies between the area of tropic of cancer and tropic of Capricorn.
- It receives maximum heat as sun rays strikes directly.
- Mid-day sun shines overhead at least once a year on all latitudes between tropic of cancer and tropic of Capricorn

Temperate Zone –

- In northern hemisphere it lies between tropic of cancer and arctic circle while in southern hemisphere it lies between tropic of Capricorn and Antarctic circle
- It receives moderate heat as sun rays are slanting.
- Mid-day sun never shines overhead between any latitude beyond the tropic of cancer and tropic o Capricorn

Frigid Zone –

- In northern hemisphere it lies between arctic circle and north pole while in southern hemisphere lies between tropic of Capricorn and south pole
- They are the coldest places on Earth and have extreme weather conditions
- These Polar Regions experience a midnight sun, when the sun is above the horizon for 24 hours, and a polar night, when the sun does not rise for 24 hours.
- The centres of both Frigid Zones, where the north and south poles are located, have six months o daylight and six months of night.
- Prime meridian – meridian which passed through Greenwich

- Its value is 0° longitude
- From this meridian we count 180° eastward and 180° westward

62) B 1, 2, 3 and 4

- All the given factors are responsible for the aridity of deserts.
    - Interior location in the continent or continentally - for example Gobi desert. It lies in the interiors of China. Moisture bearing wind shed their moisture before reaching to such regions.
    - Cold ocean currents reduce the humidity in the atmosphere. Example Atacama Desert under the influence of Peru Current.
    - Leeward location - example Patagonian Desert on the leeward side of Andes Mountains
    - Location along horse latitudes (around 30 Degrees N & S). These are regions of descending air thus experience high pressure which is not a favorable condition for rainfall.

63) B Tillite

- Tillite is the sedimentary rock formed out of deposits of glaciers. The Gondawana system of sediments from India is known to have its counter parts in six different landmasses of the Southern Hemisphere. At the base the system has thick tillite indicating extensive and prolonged glaciation. Counter parts of this succession are found in Africa, Falkland Island Madagascar, Antarctica and Australia besides India.
- Overall resemblance of the Gondawana type sediments clearly demonstrates that these landmasses had remarkably similar histories. The glacial tillite provides unambiguous evidence o palaeoclimates and also of drifting of continents. Hence, (b) is the correct answer.
- Pumice is a very light and porous volcanic rock formed when a gas-rich froth of glassy lava solidifies rapidly. Hence, it is an igneous rock. Marble is a metamorphic rock composed of recrystallized carbonate minerals, most commonly calcite or dolomite. Quartzite is a metamorphi rock formed when quartz-rich sandstone or chert has been exposed to high temperatures and pressures.

64) B Mizoram

- Mizoram which is also known as the 'Molassis basin'. It is made up of soft unconsolidated deposits.

65) C Both 1 and 2

- Different types of earthquake waves travel in different manners. As they move or propagate, they cause vibration in the body of the rocks through which they pass.
- Statement 1 is correct: Primary waves (P-waves) vibrate parallel to the direction of the wave. This exerts pressure on the material in the direction of the propagation. As a result it creates density differences in the material leading to stretching and squeezing of the material.
- Statement 2 is correct: Density difference is created by P-waves (see the above explanation). The direction of vibrations of secondary waves (S-waves) is perpendicular to the wave direction in the vertical plane, hence they create troughs and crests in the material.

66) C 2 only

- Pair 1 is not correctly matched: Hamada is a rocky desert. This consists of large stretches of bare rocks, swept clear of sand and dust by the wind. The exposed rocks are thoroughly smoothed and polished. The region is bare and sterile.
- Pair 2 is correctly matched: Reg or stony desert. This is composed of extensive sheets of angular pebbles and gravels which the winds are not able to blow off. In Libya and Egypt the term serir is used; elsewhere in Africa, stony deserts are called reg.
- Pair 3 is not correctly matched: Erg or sandy desert. This is a sea of sand which typifies the popula idea of desert scenery. Winds deposit vast stretches of undulating sand dunes in the heart of the deserts. The intricate patterns of ripples on the dune surfaces indicate the direction of the winds.

67) C 2 and 3 only

- Kamchatka Peninsula: Kamchatka is a peninsula in Russian Far East lying between the Sea of Okhotsk on the west and the Pacific Ocean and Bering Sea on the east. Nineteen of Kamchatka's volcanoes constitute the "Volcanoes of Kamchatka" UNESCO World Heritage Site.
- Anatolain Peninsula: Anatolia or Asia Minor, is a peninsular landmass comprising the Asian portion of the modern Republic of Turkey. Geographically, the region is bounded by the Black Se to the north, the Caucasus to the northeast, the Aegean Sea to the west, the Mediterranean Sea to the south, Greater Syria (Upper Mesopotamia) to the southeast and Transcaucasia and the Iranian plateau to the east.
- Labrador Peninsula: a peninsular region of eastern Canada between Hudson Bay and the Labrador Sea; contains most of Quebec and the mainland part of Newfoundland and Labrador

68) C Strait

Strait - a narrow passage of water connecting two seas or two other large areas of water.

Eg. Strait of Gibraltar

Mountain Pass - In a group of hills or mountains , a pass is a path for crossing a mountain . It is usually a saddle point between two higher areas. Many of the world's mountain ranges have always made travel difficult so passes have been important throughout history in trade, war and migration.

Valley - A valley is a low area between hills, often with a river running through it. In geology, a valley or dale is a depression that is longer than it is wide. The terms U-shaped and V-shaped are descriptive terms of geography to characterize the form of valleys.

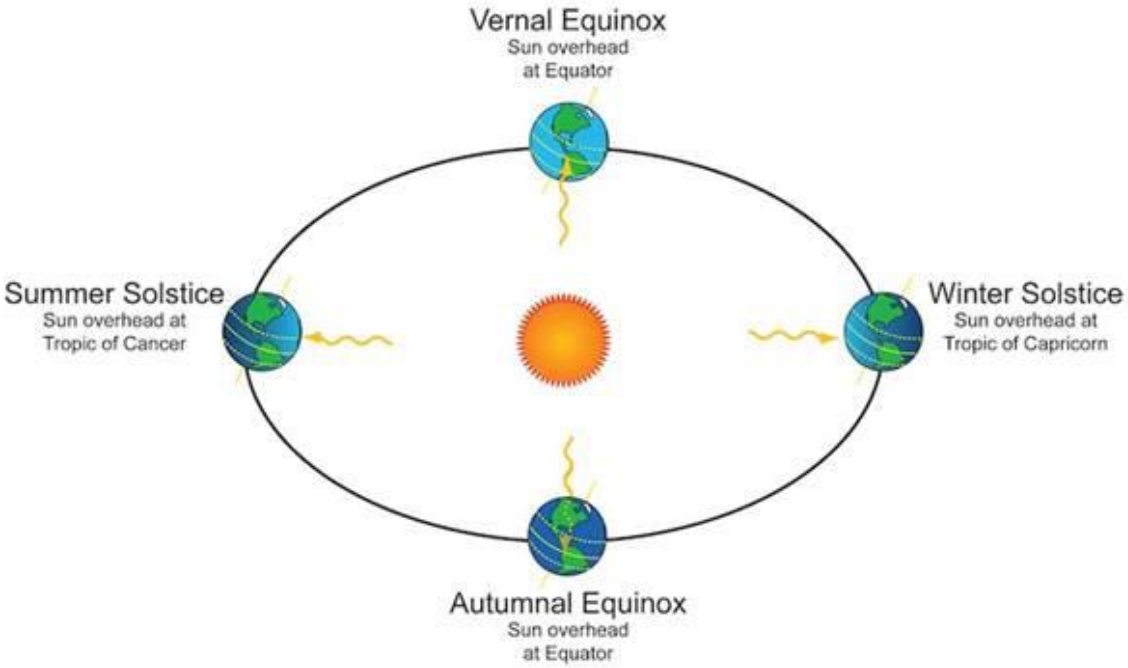
Peninsular - A peninsula is a piece of land surrounded by water on the majority of its border, while being connected to a mainland from which it extends.

69) A Summer Solstice

The Solstice occurs twice each year (around June 21 and December 22) as the Sun reaches its most northerly or southerly excursion relative to the celestial equator on the celestial sphere. The seasons o the year are directly connected to both the solstices and the equinoxes.

When the sun is directly overhead tropic of Cancer, it is called Summer Solstice and when it is directly overhead Tropic of Capricorn, it is called Winter solstice.

When the sun is directly overhead Equator, then the duration of day and night is equal, i.e 12 hours. I is called Equinox.



70) B 2 only

First Statement is wrong as 82 o 30’ East latitude is taken as the standard meridian of India.

- The longitudinal extent of India is 30 o .
- The sun rises in the east and sets in the west.
- It takes 4 minutes for the sun to move across 1 longitude. Thus, the eastern most point of India would be 2 hours ahead of the western most point (30 x 4 = 120 minutes), in accordance with the local time.
- This difference in time might create confusion in air and rail timings and so many other things across the two states. To avoid this confusion a longitude passing through the midpoint of 68 o 7' East (western most longitude) and 97 o 25' East (eastern most longitude) is taken as the standard prime meridian of India (i.e. 82 o 30').
- The time at the standard meridian 82 o 30' which passes through Mirzapur in UP is taken as the standard time of India, followed all over the country

Think!!

Standard time

71) D 3 and 4 only

- Lakes can be formed in various ways, such as by earth movement, by glaciation, by volcanic activity, etc.
- Rift valleys are formed due to faulting that leads to sinking of land between two parallel faults. It is deep, narrow and elongated in character. When water collects in these troughs rift valley lakes

are formed. Their floors are often below sea level. The best known example is the East Africa Ri Valley that includes Lake Tanganyika(the world's deepest lake), and the Dead Sea(the world's lowest lake).

- On the other hand due to the warping, sagging, bending and fracturing of the earth's crust, tectonic depressions occur. These give rise to lakes of immense depths and sizes. They include Lake Titicaca(the world's highest lake) and the Caspian Sea(the world's largest lake).

72) D 1, 2 and 3 only

- As shown in the adjoining figure, all three are correct. A line of dots in the central parts of the Atlantic Ocean runs almost parallel to the coastlines. It further extends into the Indian Ocean. It bifurcates a little south of the Indian subcontinent with one branch moving into East Africa and the other meeting a similar line from Myanmar to New Guiana. This line of dots coincides with the midoceanic ridges. The shaded belt showing another area of concentration coincides with th Alpine-Himalayan system and the rim of the Pacific Ocean. The map of volcanoes also shows similar pattern. The rim of the Pacific is also called rim of fire due to the existence of active volcanoes in this area. Hence, answer is (d).

73) D 1, 2 and 3

- When magma in its upward movement cools and turns into solid form it is called igneous rock. The process of cooling and solidification can happen in the earth‘s crust or on the surface of the earth. Hence, statement 1 is correct.
- As igneous rocks form out of magma and lava from the interior of the earth, they are known as primary rocks. The igneous rocks (Ignis –in Latin means ‗Fire‘) are formed when magma cools and solidifies. Hence, statement 2 is correct.
- They do not contain any fossils because when the ancient igneous rocks were formed due to cooling and solidification of molten rock materials at the time of the origin of the earth, there wa no life on newly born earth and since the igneous rocks are formed due to cooling and solidification of very hot and molten materials and hence any remains of plants or animals (fossils) are destroyed because of very high temperature.
- Granite, Pegmatite, Gabbro, tuff and Basalt are some examples of it. Hence statement 3 is correc

74) A 1 and 3 only

- A mountain is any natural elevation of the earth surface. Based on their mode of formation, four types of mountains can be distinguished - fold, block, volcanic, and residual mountains.
- Statement 1 is correct: When the earth's crust bends, folding occurs, but when it cracks faulting takes place. Faulting may be caused by tension or compression, forces which lengthen or shorten the earth's crust, causing a section of it to subside or to rise above the surrounding level. This faulting causes horsts or block mountains and their counterparts graben or rift valleys.

- Statement 2 is not correct and statement 3 is correct: The Rhine valley and the Vosges mountain in Europe are examples of block mountain systems. It is the fold mountains that are by far the most widespread types of mountains in the world.

75) A It is process of formation of rocks through compaction of sediments.

- The word _sedimentary‘ is derived from the Latin word sedimentum, which means settling. Rocks(igneous, sedimentary and metamorphic) of the earth‘s surface are exposed to denudationa agents, and are broken up into various sizes of fragments. Such fragments are transported by different exogenous agencies and deposited. These deposits through compaction turn into rocks. This process is called lithification.
- In many sedimentary rocks, the layers of deposits retain their characteristics even after lithification. Hence, we see a number of layers of varying thickness in sedimentary rocks like sandstone, shale etc.

76) A 1 only

- Option 1 is correct: Solifluction involves slow downslope flowing soil mass or fine grained rock debris saturated or lubricated with water.
- Option 2 is not correct: Earthflow is a rapid movement of water-saturated clayey or silty earth materials down low-angle terraces or hillsides.
- Option 3 is not correct: Slump is a type of landslide which is relatively rapid and perceptible movement. The materials involved are relatively dry. It is slipping of one or several units of rock debris with a backward rotation with respect to the slope over which the movement takes place.

77) B Oxygen> Silicon> Iron> Magnesium

The Major Elements of the Earth's Crust

Sl. No.	Elements	By Weight(%)
1.	Oxygen	46.60
2.	Silicon	27.72
3.	Aluminium	8.13
4.	Iron	5.00
5.	Calcium	3.63
6.	Sodium	2.83
7.	Potassium	2.59
8.	Magnesium	2.09
9.	Others	1.41

78) C. Bangladesh

Following are the lengths of the land boundary which India shares with its neighbours.

- Bangladesh:4,096.7 km
- China:3,488 km

- Pakistan:3,323 km
- Nepal:1,751 km
- Myanmar:1,643 km
- Bhutan: 699 km
- Afghanistan: 106 km
- Total :15,106.7 km

79) B 3-4-5-1-2

- The basic pattern of planetary circulation has seven surface components of pressure and wind, which are replicated north and south of the equator. They are:
  - Intertropical Convergence Zone (ITCZ) / Dolrums
  - Trade winds
  - Subtropical Highs / Horse Latitudes
  - Westerlies
  - Polar front (Subpolar lows)
  - Polar easterlies
  - Polar highs

80) C Both 1 and 2

- The temperate grasslands are found generally in the interiors of continents. These grasslands are so distinctive in their natural vegetation that, although those which occur in the southern hemisphere have a much more moderate climate, they are often dealt with together. Some examples are the Steppes and the Prairies in the northern hemisphere and the Pampas, Veld, and Downs in the southern hemisphere.
- In the northern hemisphere the grasslands are far more extensive and are entirely continental. In the southern hemisphere, due to the narrowness of the temperate portions of the southern continents, the grasslands are rather restricted and less continental.
- Winters are very cold in the continental steppes of Eurasia (northern hemisphere) because of enormous distance from the nearest sea. In contrast, the winters in the grasslands in the southern hemisphere are mild. This illustrates the moderating effect of oceans on the climates of the southern hemisphere.
- In the Eurasian steppes, the annual precipitation is light, with the average at around 20 inches, whereas in the southern hemisphere the annual precipitation is always more than 20 inches because of the warm ocean currents that wash the shores of the grasslands. This is another instance of maritime influence on the climate of the temperate grasslands in the southern hemisphere.

81) D 1, 2 and 3

- The air is set in motion due to the differences in atmospheric pressure. The air in motion is called wind. The wind blows from high pressure to low pressure. The wind at the surface experiences friction. In addition, rotation of the earth also affects the wind movement. The force exerted by the rotation of the earth is known as the Coriolis force. Thus, the horizontal winds near the earth surface respond to the combined effect of various forces:
    - Pressure gradient force
    - Frictional force
    - Coriolis force.
    - In addition, the gravitational force acts downward.

82) C 1 and 3 only

- Statement 1 is correct:The Cool Temperate Eastern Margin (Laurentian) Climate is an intermediate type of climate between the British and the Siberian types of climates. It has feature of both the maritime and the continental climates: cold dry winters and warm wet summers.
- Statement 2 is not correct: It is found in the north-eastern North America and in the eastern coastlands of Asia.
- Statement 3 is correct:In the North American region rain falls throughout the year, with a distinct summer maximum. In the Asiatic region, rainfall is less uniform and winters are very dry while summers are extremely wet. The heavy rainfall, the warm summers and the damp air from fogs a favour the growth of trees. So, the predominant vegetation of the Laurentian type of climate is cool temperate forest.

83) D 1, 2 and 3

- The cyclones developing in the mid and high latitude, beyond the tropics are called the middle latitude or extra tropical cyclones. The passage of front causes abrupt changes in the weather conditions over the area in the middle and high latitudes.The extra tropical cyclones:
    - Have a clear frontal system which is not present in the tropical cyclones
    - Cover a larger area
    - Can originate over the land and sea.
    - Affects a much larger area as compared to the tropical cyclone
    - Move from west to east but tropical cyclones, move from east to west.
    - Tropical cyclones originate only over the seas and on reaching the land they dissipate. The wind velocity in a tropical cyclone is much higher and it is more destructive.

84) C 1 and 3 only

- The Inter Tropical Convergence Zone (ITCZ) is a low pressure zone located at the equator where trade winds converge, and so, it is a zone where air tends to ascend. In July, the ITCZ is located

around 20oN- 25oN latitudes (over the Gangetic plain), sometimes called the monsoon trough. This monsoon trough encourages the development of thermal low over north and northwest India. Due to the shift of ITCZ due apparant movement of sun, the trade winds of the southern hemisphere cross the equator between 400 and 60oE longitudes and start blowing from southwest to northeast due to the Coriolis force. It becomes southwest monsoon. In winter, the ITCZ moves southward, and so the reversal of winds from northeast to south and southwest, takes place. They are called northeast monsoons. Hence, only statements 1 and 3 are correct.

85) A Relief Rainfall

- When the saturated air mass comes across a mountain, it is forced to ascend and as it rises, it expands; the temperature falls, and the moisture is condensed. The chief characteristic of this sort of rain is that the windward slopes receive greater rainfall. It is Orographic Rainfall which is also known as the relief rainfall.
- After giving rain on the windward side, when these winds reach the other slope, they descend, and their temperature rises. Then their capacity to take in moisture increases and hence, these leeward slopes remain rainless and dry. The area situated on the leeward side, which gets less rainfall is known as the rain-shadow area.
- Convectional rainfall- When the land warms up, it heats the air above it. This causes the air to expand and rise. As the air rises it cools and condenses. If this process continues then rain will fall Convectional precipitation is heavy but of short duration, highly localised and is associated with minimum amount of cloudiness. It occurs mainly during summer and is common over equatorial doldrums in the Congo basin, the Amazon basin and the islands of south-east Asia.
- Cyclonic Rainfall is convectional rainfall on a large scale. The precipitation in a tropical cyclone i of convectional type while that in a temperate cyclone is because of frontal activity.
- Monsoonal Rainfall type of precipitation is characterized by seasonal reversal of winds which carr oceanic moisture (especially the south-west monsoon) with them and cause extensive rainfall in south and southeast Asia.

86) A 1 and 2 only

The two terms are related to earthquake.

Earthquake – Whenever there is a movement in lithospheric plates, the surface of the earth above th plates vibrates. These vibrations can travel all-round the earth and are called as EARTHQUAKE.

OR

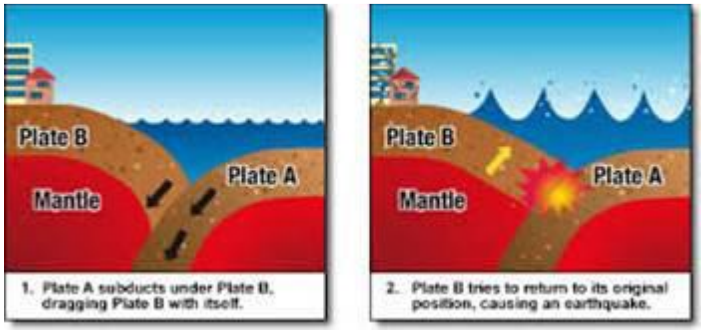
Earthquake involves a shock or series of shocks due to sudden movement of crustal rocks within the crust or mantle.

- earthquakes are generally associated with the boundaries of tectonic plates Causes of Earthquakes

- Release of stress along a fault, or fracture in the earth's crust

The tectonic plates are always slowly moving, but they get stuck at their edges due to friction.

When the stress on the edge overcomes the friction, there is an earthquake that releases energy in waves that travel through the earth's crust and cause the shaking that we feel.



- Volcanic activity
- Human induced activities
- weight of large amount of water stored in dams can cause breaking of plates
- explosions

Statement 1 & 3 – The point where the energy is released is called the focus of an earthquake, alternatively, it is called the hypocentre.

Statement 2 – The energy waves travelling in different directions reach the surface. The point on the surface, nearest to the focus, is called epicentre. It is the first one to experience the waves. It is a poin directly above the focus.

Greatest damage is usually closest to the epicentre and the strength of the earthquake decreases away from the centre.

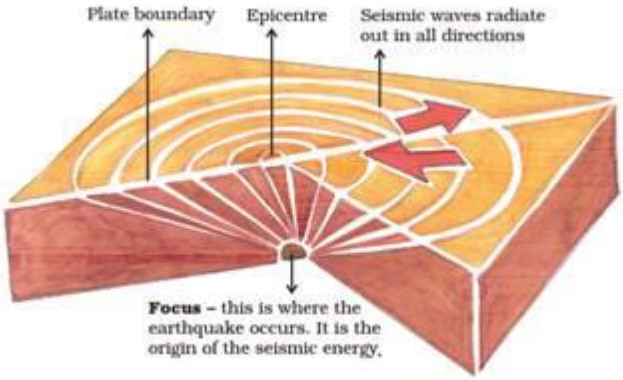


Fig. 3.3: Origin of an Earthquake

87) D All of the above

A landslide is the movement of rock, debris or earth down a slope. They result from the failure of the materials which make up the hill slope and are driven by the force of gravity. Landslides are known also as landslips, slumps or slope failure.

Reasons

1. Mainly occurs at steep slope like mountains, cliff, artificially steepened slopes like road

2. They may also occur because a steep slope is undercut by river or sea and falls by gravity

3. Earthquakes and volcanic disturbances may lose the rocks and start off landslide

- earthquakes adding loads to barely stable slope
- earthquake-caused liquefaction destabilizing slopes

4. Lubricating action of rain - one of main reason

- Water may collect in joints

5. Clearing of vegetation by man for agri, house (more penetration of water)

Natural causes of landslides include:

- groundwater (pore water) pressure acting to destabilize the slope
- loss or absence of vertical vegetative structure, soil nutrients, and soil structure (e.g. after a wildfire
  - a fire in forests lasting for 3–4 days)
- erosion of the toe of a slope by rivers or ocean waves
- weakening of a slope through saturation by snow melt, glaciers melting, or heavy rains

Do you know?

Landslides that occur undersea, or have impact into water, can generate tsunamis. Massive landslides can also generate mega tsunamis, which are usually hundreds of meters high. In 1958, one such tsunami occurred in Lituya Bay in Alaska

88) C. It refers to the balance between amount of heat received by earth and the amoun of heat radiated.

- Heat Budget of the Earth is the balance between incoming solar insolation and outgoing terrestrial radiation which maintains the average annual temperature of earth at 15 degree Celsius. The amount of insolation received is directly related to latitude. If it were not for the heat transfers within the atmosphere and the oceans, the tropical zones would get hotter and the polar zones would get colder through time.

89) D None of the above

All the given statements are correct about P-Waves. Since question asked to select incorrect, answer is (d)

Primary Waves (P waves)

- Also called as the longitudinal or compressional waves.
- Particles of the medium vibrate along the direction of propagation of the wave.
- P-waves move faster and are the first to arrive at the surface.
- These waves are of high frequency.
- They can travel in all mediums.
- Velocity of P waves in Solids > Liquids >Gases
- Their velocity depends on shear strength or elasticity of the material.

Do you know?

- Secondary Waves is called as transverse or distortional waves.
- A secondary wave cannot pass through liquids or gases.

90) A 3 and 5 only

Answer Justification :

Justification: Space exploration is governed by a complex series of international treaties and agreements which have been in place for years. The first and probably most important of them is the Outer Space Treaty. The treaty was initially signed by the United States of America, the United Kingdom and the Soviet Union on January 27, 1967 and it came into effect from October 10, 1967. The treaty was initially called 'Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial bodies.

Statement 1: The treaty forbids countries from deploying "nuclear weapons or any other kinds of weapons of mass destruction" in outer space. The term "weapons of mass destruction" is not defined but it is commonly understood to include nuclear, chemical, and biological weapons. The treaty, however, does not prohibit the launching of ballistic missiles, which could be armed with WMD warheads, through space.

91) B. Digital India programme

Answer Justification :

Justification: Even though it might be useful in all major schemes, it was seen as a strategic intervention for Digital India to succeed.

CSCs are the access points for delivery of various electronic services to villages in India, thereby contributing to a digitally and financially inclusive society.

CSCs enable the three vision areas of the Digital India programme:

- Digital infrastructure as a core utility to every citizen.
- Governance and services on demand.
- Digital empowerment of citizens.

Significance of CSCs:

CSCs are more than service delivery points in rural India. They are positioned as change agents, promoting rural entrepreneurship and building rural capacities and livelihoods. They are enablers of community participation and collective action for engendering social change through a bottom-up approach with key focus on the rural citizen.

The CSC project, which forms a strategic component of the National eGovernance Plan was approve by the Government in May 2006, as part of its commitment in the National Common Minimum Programme to introduce e-governance on a massive scale.

92) A. Gadgil formula in 1969

Answer Justification :

Learning: There is no provision of SCS in the Constitution; the Central government extends financia assistance to states that are at a comparative disadvantage against others. The concept of SCS emerged in 1969 when the Gadgil formula (that determined Central assistance to states) was approved.

Some prominent guidelines for getting SCS status:

- Must be economically backward with poor infrastructure.
- The states must be located in hilly and challenging terrain.
- They should have low population density and significant tribal population.
- Should be strategically situated along the borders of neighbouring countries.

What kind of assistance do SCS States receive?

- The SCS States used to receive block grants based on the Gadgil-Mukherjee formula, which effectively allowed for nearly 30 per cent of the Total Central Assistance to be transferred to SCS States as late as 2009-10.
- Following the constitution of the NITI Aayog (after the dissolution of the Planning Commission) and the recommendations of the Fourteenth Finance Commission (FFC), Centra plan assistance to SCS States has been subsumed in an increased devolution of the divisible pool to all States (from 32% in the 13th FC recommendations to 42%) and do not any longer appear in plan expenditure.

- The FFC also recommended variables such as “forest cover” to be included in devolution, wit a weightage of 7.5 in the criteria and which could benefit north-eastern States that were previously given SCS assistance. Besides, assistance to Centrally Sponsored Schemes for SCS States was given with 90% Central share and 10% State share.

93) A. 1 only

Answer Justification :

Justification: INDIGO, or IndIGO (Indian Initiative in Gravitational-wave Observations) is a consortium of Indian gravitational-wave physicists.

This is an initiative to set up advanced experimental facilities for a multi-institutional observatory project in gravitational-wave astronomy.

Since 2009, the IndIGO Consortium has been planning a roadmap for gravitational-wave astronomy and a phased strategy towards Indian participation in realizing a gravitational-wave observatory in th Asia-Pacific region. IndIGO is the Indian partner (along with the LIGO Laboratory in U.S.) in planning the LIGO-India project

The network includes the two LIGO detectors in the US (in Hanford and Livingston), the Virgo and GEO600 detectors in Europe, and the proposed KAGRA detector in Japan. By simultaneous detectio of the same event on these multiple detectors, a precise location in the sky can be pinpointed for the source of the detected waves.

For example, the first detected gravitational waves by LIGO could only pinpoint the location of the black hole merger source to a broad area of the southern hemisphere sky. Using triangulation, this location information could be improved if the signal was detected on more than two detectors.

Another important goal of IndIGO is to train scientists for successfully operating the LIGO-India detector, when commissioned. Previous studies have shown that a detector operational in India woul improve source localization significantly, by an order of magnitude or more, depending on the regio of the sky.

94) D. None

Answer Justification :

Justification: Statement 1: Under RISE, all centrally-funded institutes (CFIs), including entral universities, IITs, IIMs, NITs and IISERs, can borrow from a Rs 1,00,000 crore corpus over the next four years to expand and build new infrastructure. The initiative aims to step up investments in research and related infrastructure in premier educational institutions, including health institutions.

Statement 2: Higher Education Financing Agency (HEFA) would be suitably structured for funding this initiative. The manner in which investment in institutions is provided is likely to be the same as i practised in HEFA, but there may be different windows for different institutions.

The Union Cabinet had approved HEFA in September 2016 as a Special Purpose Vehicle with a public sector bank (Canara Bank). It would be jointly funded by the promoter/bank and the MHRD with an authorised capital of Rs. 2,000 crore. The government equity would be Rs.1,000 crore.

95) D. 2 and 3 only

Answer Justification :

Justification: The PCR will essentially provide a single-point and real-time source for financial liabilities of a person or entity. The decision is based on the report of RBI appointed task force led by YM Deosthalee.

Statement 1: Currently, there are multiple granular credit information repositories in India, each wit distinct objective and coverage. Within the RBI, CRILC is a borrower-level supervisory dataset with a threshold in aggregate exposure of Rs 5 crore. Also, there are four privately-owned credit information companies (CICs) in India.

The RBI has mandated all its regulated entity to submit credit information individually to all four CICs. CICs offer, based on this unique access to the credit data, value added services like credit scoring and analytics to the member credit institutions and to the borrowers.

Learning: The PCR will be the single point of mandatory reporting for all material events for each loan, notwithstanding any threshold in the loan amount or type of borrower. The PCR will serve as a registry of all credit contracts, duly verified by reporting institutions, for all lending in India and any lending by an Indian institution to a company incorporated in India.

Need for a public registry:

Credit information is spread over multiple systems in bits and pieces, making it difficult to get a comprehensive view of the financial liabilities of a person or entity. A PCR aims to remove information asymmetry to foster the level of access to credit, and to strengthen the credit culture in the economy.

Also, a comprehensive credit information repository covering all types of credit facilities (funded and non-funded) extended by all credit institutions – commercial banks, cooperative banks, NBFCs, MFI – and also covering borrowings from other sources, including external commercial borrowings and borrowing from market, is essential to ascertain the total indebtedness of a legal or natural person.

Benefits of having a PCR:

- A PCR can potentially help banks in credit assessment and pricing of credit as well as in making risk-based, dynamic and counter-cyclical provisioning.
- The PCR can also help the RBI in understanding if transmission of monetary policy is working, and if not, where are the bottlenecks.

- Further, it can help supervisors, regulators and banks in early intervention and effective restructuring of stressed bank credits.
- A PCR will also help banks and regulators as credit information is a 'public good' and its utility is to the credit market at large and to society in general.

96) B. China, France, Russia, the United States, Britain, Israel and India

Answer Justification :

Learning: At present, India has in its armoury the Agni series — Agni-1 with 700 km range, Agni-2 with 2,000 km range, Agni-3 and Agni-4 with 2,500 km to more than 3,500 km range.

With the Agni-V missile, India has joined an elite club of nations that possess the ICBM launch capability. Only the five permanent members of the United Nations Security Council – China, France Russia, the United States and Britain, along with Israel, have so far possessed such longrange missiles.

Agni-5 Ballistic Missile is a surface-to-surface missile which can carry nuclear warhead weighing 1. tonnes to a distance of over 5,000 km and is the longest missile in India's arsenal capable of reaching most parts of China.

The missile features many new indigenously-developed technologies, including the very high accuracy Ring Laser Gyro based Inertial Navigation System (RINS), and the most modern and accurate Micro Navigation System (MINS) which improves the accuracy of the missile.

97) C. Both 1 and 2

Answer Justification :

Justification: A group of 427 trained volunteers, called Ganga Praharis, are reaching to each and every house in areas along river Ganga to educate them about the importance of protecting river's Bihar and West Bengal.

They are new grassroot-level volunteers to protect the bio-diversity of river Ganga. They are ropedin by Wildlife Institute of India (WII), Dehradun as part of the "Biodiversity Conservation and Ganga Rejuvenation" project being sponsored by National Mission for Clean Ganga (NMCG) under the aegis of the Namami Gange programme.

Ganga Praharis are well trained in ecological monitoring of Ganga aqua life, plantation techniques, awareness creation and community mobilization. They are trained through a series of national, state and site level workshops in diverse skills such as ecological surveys, rescue and rehabilitation of aquatic species, awareness meetings, social interactions and green livelihood skills.

Roles and functions:

The Ganga Praharis will be linked to various local environmental authorities, non-governmental stakeholders in their respective states and various other national, academic and research institutions for their capacity development.

Not only do these Ganga Praharis performing the task of conserving the deteriorating biodiversity of river Ganga, they are also motivating other people to spread the clean Ganga message, thus, contributing in making clean Ganga mission a mass movement.

The Ganga Praharis will be the role models in inspiring other members of the community to join hands in the efforts for conservation of the biodiversity of river Ganga. Thus, each Prahari shall work on the model of 'Each One Make Ten'.

98) D. Combatant command of USA in Indo-Asia-Pacific region

Answer Justification :

Justification: Formerly known as United States Pacific Command, it is a unified combatant command of the United States Armed Forces responsible for the Indo-Asia-Pacific region. It is the oldest and largest of the unified combatant commands.

- The US military has renamed its Pacific Command to US-Indo Pacific Command, underlining th growing connectivity between India and Pacific Oceans. The symbolic move came in recognitio of the growing importance of the Indian Ocean in US strategic thinking.
- Also, renaming the combatant command is strategically significant, in that it reflects a recognitio within the U.S. government that East Asia and the Indian Ocean Region are gradually becoming single competitive space. It's also shrewd marketing — a way of reaffirming to New Delhi and t the rest of the world that India is, and ought to be, an indispensable pole of the future Asian orde
- Learning: U.S. Indo-Pacific Command is considered critical by the USA for "a region open to investment and free, fair and reciprocal trade, not bound by any nation's predatory economics or threat of coercion, for the Indo-Pacific has many belts and many roads."

99) C. A is incorrect, but R is correct.

Answer Justification :

Justification: Former Supreme Court judge Justice R K Agrawal has been recently appointed the President of the NCDRC.

The National Consumer Disputes Redressal Commission (NCDRC), India is a quasi-judicial commission in India which was set up in 1988 under the Consumer Protection Act of 1986. The commission is headed by a sitting or retired judge of the Supreme Court of India.

Statement R: Section 23 of Consumer Protection Act, 1986, provides that any person aggrieved by an order of NCDRC, may prefer an Appeal against such order to Supreme Court of India within a period of 30 days.

Section 21 of Consumer Protection Act, 1986 posits that the National Consumer shall have jurisdiction to entertain a complaint valued more than one crore and also have Appellate and Revisional jurisdiction from the orders of State Commissions or the District fora as the case may be.

100) B. 2 only

Answer Justification :

Concept: Ferromagnetism is the basic mechanism by which certain materials form permanent magnets, or are attracted to magnets.

So far, only three single elements were found to be ferromagnetic at room temperature: iron (Fe), cobalt (Co), and nickel (Ni); the rare earth element gadolinium (Gd) nearly misses by only 8 degrees Celsius.

Magnetic materials are very important in industry and modern technology and have been used for fundamental studies and in many everyday applications such as sensors, electric motors, generators, hard disk media, and most recently spintronic memories.

Justification: A platinum-group chemical element called ruthenium (Ru) is the fourth single elemen to have unique ferromagnetic properties at room temperature.

From an application perspective, Ru is interesting because it does not oxidize easily and theoretical predictions indicate it is particularly temperature-stable, which is an important property allowing scaling of magnetic memories.

Learning: Like the other metals of the platinum group, ruthenium is inert to most other chemicals.

Most ruthenium produced is used in wear-resistant electrical contacts and thick-film resistors.

A minor application for ruthenium is in platinum alloys and as a chemistry catalyst. A new application of ruthenium is as the capping layer for extreme ultraviolet photomasks.

Ruthenium is generally found in ores with the other platinum group metals in the Ural Mountains an in North and South America. Small but commercially important quantities are also found in pentlandite extracted from Sudbury, Ontario and in pyroxenite deposits in South Africa.