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1. Geography

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1. Which of the following statements are incorrect with respect to Ocean Currents?

1. The speed of currents decreases with depth.
2. Cold currents are usually found on the west coast of continents in low and middle latitudes.
3. Ocean currents move in a clockwise direction in Southern hemisphere and anticlockwise in northern hemisphere.

Select the correct code.

- A. 3 and 4 only
- B. 2 and 3 only
- C. 3 only
- D. 1, 2 and 3 only

Answer: C

Explanation

- Ocean currents are general movement of a mass of surface water in a fairly defined direction and the speed of the current has nothing to do with the depth of the current. It is a persistent, mostly horizontal flow of oceanic water.
- Cold currents are usually found on the west coast of the continents in the low and middle latitudes (true in both hemispheres) and on the east coast in the higher latitudes in the Northern Hemisphere.
- The tropical deserts found on the western margins of the continent owe their existence to these cold currents.
- The Ocean Currents move in a clockwise direction in Northern Hemisphere and anticlockwise direction in Southern Hemisphere.

- Warm ocean currents are wide and shallow while cold ocean currents are narrow and deep.

2. Consider the following statements

1. This layer of earth's crust makes up about 85% of the volume of the earth.
2. Its density varies between 3.4-3.5 g/ cubic cm to 5.5 g/ cubic cm.
3. It contains dense, coarse grained igneous rocks mostly made of minerals like olivine and pyroxene.

Which layer of earth is explained in above statements?

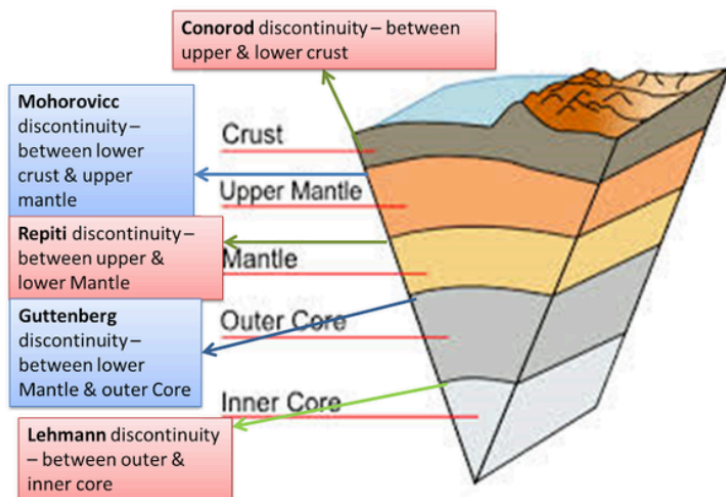
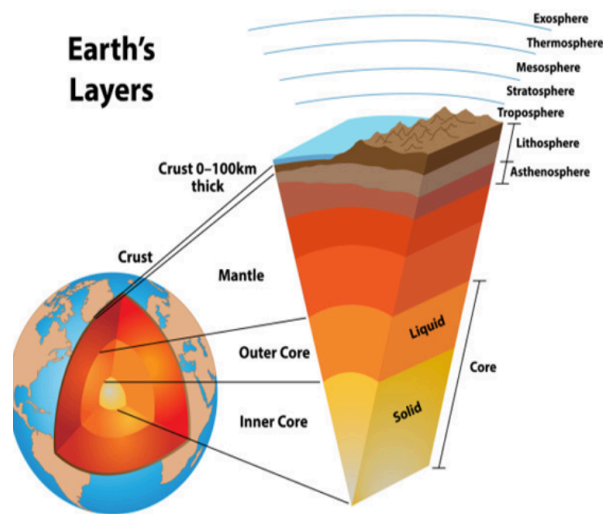
- A. Crust
- B. Mantle
- C. Outer core
- D. Inner core

Answer: B

Explanation

- The mantle extends from Moho's discontinuity (35 km) to a depth of 2,900 km (Moho-Discontinuity to the outer core).
- The crust and the uppermost part of the mantle are called lithosphere. Its thickness ranges from 10-200 km.
- The lower mantle extends beyond the asthenosphere. It is in solid state.
- The density of mantle varies between 2.9 and 3.3. The density ranges from 3.3 to 5.7 in the lower part. It is composed of solid rock and magma.
- It forms 83 per cent of the earth's volume.

- The outer layer of the mantle is partly simatic while the inner layer is composed of wholly simatic ultra-basic rocks.



3. Consider the following statements with respect to International North South Transport Corridor.

1. Azerbaijan and Russia are included in this corridor.
2. It will synchronize with the Ashgabat agreement.

Which of the above statements is/are correct?

- A. 1 only
- B. 2 only
- C. Both 1 and 2

D. None of the above

Answer: C

Explanation



- International North-South Transport Corridor (INSTC) is a multi modal transportation established in 2000 for the purpose of promoting transportation cooperation among the Member States.

- This corridor connects India Ocean and Persian Gulf to the Caspian Sea via Iran, Islamic Rep., and is then connected to Saint Petersburg and North European via Russia.

- Countries/Territories/Economies associated with this Initiative:

✓ Armenia ; Azerbaijan ; Belarus ; Bulgaria ; India ; Iran, Islamic Republic of ; Kazakhstan ; Kyrgyz Republic ; Oman ; Russian Federation ; Syrian Arab Republic ; Tajikistan ; Turkey ; Ukraine.

- Ashgabat Agreement envisages facilitation of transit and transportation of goods between Central Asia and the Persian Gulf.
- India's accession to the Agreement would diversify India's connectivity options with Central Asia and have a positive influence on India's trade and commercial ties with the region.

- Upon receipt of approval of the Union Cabinet for India's accession to the Ashgabat Agreement, India had deposited the Instrument of Accession with Turkmenistan in April 2016.

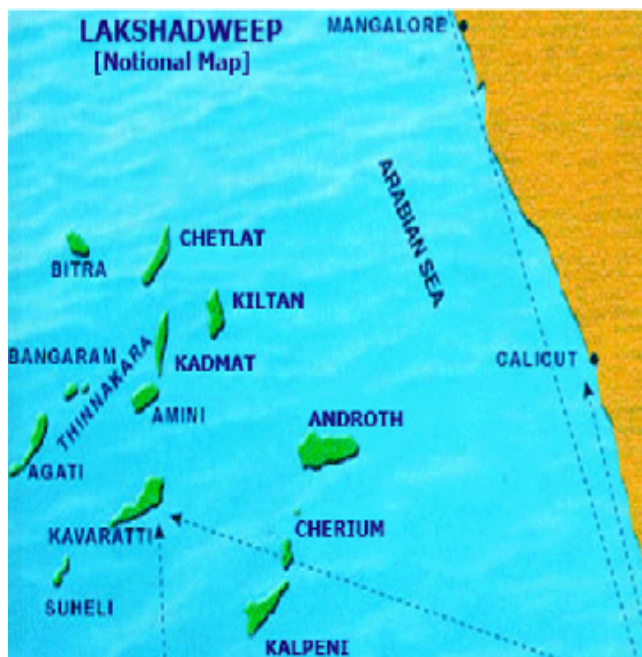
4. Agatti island are located in which of the following territories?

- A. Lakshadweep
- B. Andaman & Nicobar
- C. Tamil Nadu
- D. Orissa

Answer: A

Explanation

- Agatti Island is a 7.6 km long island, situated on a coral atoll called Agatti atoll in the Union Territory of Lakshadweep.



5. There are various type of erosions as one seen in making of Chambal Badland topography. Which of the following erosion is the deepest?

- A. Splash erosion
- B. Sheet erosion
- C. Rill erosion
- D. Gully erosion

Answer: D

Explanation

- Gully erosion refers to the cutting of narrow channels called gullies. The gullies can be caused by small channels of approximately 3 to 12 inches deep. Gullies may be one to several feet deep.
- Gully erosion cuts deep and removes the surface soil as well as deeper soil that may still have substantial amounts of total nutrients but less compared to the surface soil.
- Gully erosion needs to be prevented, as it is difficult to check once started. Gully erosion is common on steep slopes. Gullies deepen with rainfall, cut the agricultural lands into small fragments and make them unfit for cultivation.
- A region with a large number of deep gullies or ravines is called badland topography.

2. History & Culture

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1. Consider the following statements about the Lord Lytton's tenure as Viceroy in India :

1. The Arms Act, passed in 1878, prevented the Indians to keep arms without appropriate license.
2. The system of decentralisation of finance that had begun in the time of Lord Mayo was abolished during the time of Lord Lytton.

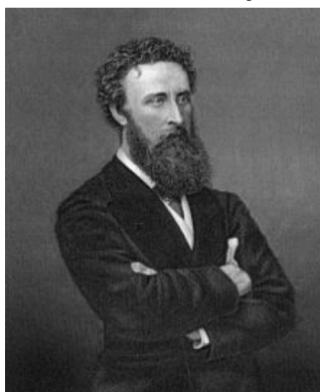
Which of the above statements is/are correct?

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

Answer: A

Explanation

Robert Bulwer -Lytton



6th Viceroy of India (1876-80)

- Vernacular Press Act, 1878

- Arms Act, 1878
- Abolished tax on cotton for British traders
- Maximum age to take up civil services exam lowered from 21 to 19
- In the year 1878, the Arms Act was passed.
 - ✓ This Act prevented the Indians to keep arms without appropriate license. Its violation would be a criminal offence.
 - ✓ The Europeans and the Anglo-Indians were exempted from the operation of these legislations.
- The system of decentralisation of finance that had begun in the time of Lord Mayo was continued during the time of Lord Lytton.
- The provincial governments were empowered with some control over the expenditure of all provincial matters like land-revenue, excise, stamps, law and justice.
- Lytton wanted to encourage the provinces in collecting the revenue and thereby strengthen the financial power and position of the provinces.

2. Which of these Mughal Emperors did not engage in a conflict with the Sikhs?

1. Akbar
2. Jahangir
3. Humayun
4. Aurangzeb

Select the correct answer using the codes given below

- A. 1 only
B. 1 and 3 only
C. 1 and 4 only
D. 1, 3 and 4 only

Answer: B

Explanation

- Jahangir martyred Guru Arjan Dev, 5th Sikh Guru.
✓ He later imprisoned the 6th guru, Guru Hargobind at Gwalior, but released him after a number of years when he no longer felt threatened.
- Shah Jahan, took offence at Guru Hargobind's "sovereignty" and after a series of assaults on Amritsar forced the Sikhs to retreat to the Sivalik Hills.
- Aurangzeb martyred the 9th Sikh guru, Guru Teg Bahadur and then engaged in battle with Guru Gobind Singh, the 10th Sikh guru.

- Akbar, on the other hand, supported religious freedom and after visiting the langar of Guru Amar Das got a favourable impression of Sikhism.

✓ As a result of his visit he donated land to the langar and the Mughals did not have any conflict with Sikh gurus until his death in 1605.

3. Consider the following statements with respect to Charvaka School of Indian Philosophy.

1. It rejects supernatural concepts like God and soul, but accepts metaphysical concepts like afterlife and moksha.
2. It evolved around in 6th-7th CE.
3. They held perception and direct experiments to be the valid and reliable source of knowledge.

Which of the above statements is/are incorrect?

- A. 1 only
B. 1 and 2 only
C. 3 only
D. 2 and 3 only

Answer: B

Explanation

- Charvaka/Lokyata is an ancient school of Indian materialism, one of the popular belief system in Ancient India. (Traditional name of Charvaka is Lokyata)
- Founder - Brihaspati - Brihaspati Sutra (lost)
- Time Period - Around 5-6th century BCE.
- Rejects supernatural concepts like God and soul and also metaphysical concepts like afterlife (or reincarnation) and moksha.
- In Charvaka Philosophy, Perception is of 2 types - External and Internal.

4. Which of the following describes Qissa & Var?

- A. It was the mystical poetry of Kashmiri Saints.
- B. An account of Mewar Rajput's by bards.
- C. Love ballads & Heroic poetry in Punjabi.
- D. Stories related to Buddhist tanka cults.

Answer: C

Explanation

- The word Qissa, which is Arabic in origin, means a tale. In Punjabi the Qissa developed under the influence of Persian poetry.

- It is interesting to note that the Persian poets have used the word Mathnavi (a poem in rhyming distichs) for their long narratives in verse, instead of the word Qissa.
- In fact the word Qissa is used in Arabic, Persian and Urdu for a long tale in prose.
- There are certain genres that are popular in Punjabi literature such as 'Qissa' (tale/legend) 'Var' (Epic) and 'Dhola' (ballad).

5. Consider the following statements with respect to Khajuraho temples.

1. These are dedicated to only one religion.
2. They are specimens of Nagara style of temple building.

Which of the above statements is/are correct?

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

Answer: B

Explanation

- The Khajuraho Group of

- Monuments is a group of Hindu and Jain temples in Madhya Pradesh, India, about 175 kilometers (109 mi) southeast of Jhansi.
- They are one of the UNESCO World Heritage Sites in India.
- The temples are famous for their nagara-style architectural symbolism and their erotic sculptures. Most Khajuraho temples were built between 950 and 1050 by the Chandela dynasty. These are dedicated to Shiva, Vishnu and Jain Tirthankaras.

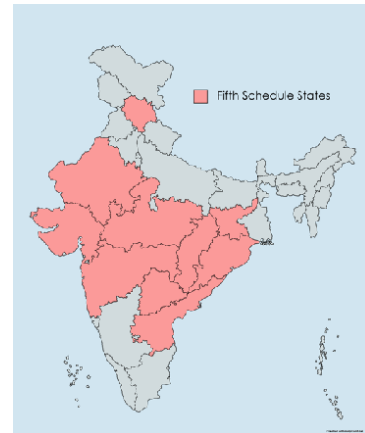


3. Polity & Governance

Click [here](#) to watch the following questions on YouTube

1. Under which schedule of the Constitution of India can the transfer of tribal land to private parties for mining be declared null and void?

- A. Third Schedule
- B. Fifth Schedule
- C. Ninth Schedule
- D. Twelfth Schedule



Answer: B

Explanation

- In the Article 244(1) of the Constitution, expression Scheduled Areas means such areas as the President may by order declare to be Scheduled Areas.
- The Constitution provides autonomy to tribal areas in matters of governance under the Fifth and Sixth Schedules, which is further fortified by the Samatha v. State of Andhra Pradesh & Ors (1997) judgment where the Supreme Court declared that the transfer of tribal land to private parties for mining was null and void under the Fifth Schedule.
- The Fifth Schedule designates tribal majority areas in ten tribal minority states within peninsular India including, Andhra Pradesh, Telangana, Gujarat, Jharkhand, Chhattisgarh, Himachal Pradesh, Madhya Pradesh, Maharashtra, Odisha, and Rajasthan.

2. Which of the following is correct regarding the President's Rule?

- 1. It may be imposed whenever a state fails to comply with or to give effect to any direction from the Centre.
- 2. The proclamation needs to approved only by Lok Sabha within 1 month from the date of its issue.
- 3. If approved by both the Houses of Parliament, the President's Rule continues for six months.
- 4. It cannot be extended for a period of more than two years with the approval of the Parliament, every six months.

Select the correct code.

- A. 1 and 2 only
- B. 2 and 3 only
- C. 1 and 3 only
- D. 1, 2 and 3 only

Answer: C

Explanation

- The President's Rule can be proclaimed under Article 356 on two grounds—one mentioned in Article 356 itself and another in Article 365:
 - ✓ Article 356: A situation has arisen in which the government of a state cannot be carried on in accordance with the provisions of the Constitution.
 - ✓ Notably, the president can act either on a report of the governor of the state or otherwise too (ie, even without the governor's report).
 - ✓ Article 365: Whenever a state fails to comply with or to give effect to any direction from the Centre.
 - ✓ A proclamation imposing President's Rule must be approved by both the Houses of Parliament within two months from the date of its issue.
 - ✓ If approved by both the Houses of Parliament, the President's Rule continues for six months.
 - ✓ It can be extended for a maximum period of three years with the approval of the Parliament, every six months.

3. Consider the following statements:

1. The Constitution of India defines its 'basic structure' in terms of federalism, secularism, fundamental rights and democracy.
2. The Constitution of India provides for 'judicial review' to safeguard the 'citizens' liberties and to preserve the ideals on which the constitution is based.

Which of the statements given above is/are correct?

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

Answer: B

Explanation

- The phrase 'basic structure' itself cannot be found in the Constitution.
- The Supreme Court recognised this concept for the first time in the historic Kesavananda Bharati case in 1973.
- Article 13 in fact provides for the judicial review of all legislations in India, past as well as future.



- This power has been conferred on the High courts and the Supreme court of India which can declare a law unconstitutional if it is inconsistent with any of the provisions of part 3rd of the constitution.

4. Consider the following statements with respect to Essential Defence Services Bill, 2021.

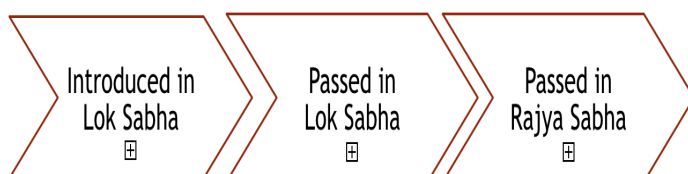
- 1. Under the Bill, the central government may prohibit strikes, lock-outs, and lay-offs in units engaged in essential defence services.**
- 2. Employers violating the prohibition order through illegal lock- outs or lay-offs will be punished with up to one year imprisonment or Rs 10,000 fine, or both.**
- 3. Fundamental right to form an association can be restricted under Article 19(4) for armed forces and police.**

Which of the above statements is/are correct?

- A. 1 and 2 only
- B. 3 only
- C. 2 and 3 only
- D. 1, 2 and 3

Answer: D

Explanation



- The Bill allows the central government to prohibit strikes, lock- outs, and lay-offs in units engaged in essential defence services.
- The Bill amends the Industrial Disputes Act, 1947 to include essential defence services under public utility services.
- Under the Act, in case of public utility services, a six-week notice must be given before: (i) persons employed in such services go on strike in breach of contract or (ii) employers carrying on such services do lock-outs.
- Essential defence services include any service in:
 - ✓any establishment of the armed forces or connected with them or defence.
 - ✓These also include services that, if ceased, would affect the safety of the establishment engaged in such services or its employees.
- In addition, the government may declare any service as an essential defence service if its cessation would affect the:
 - ✓Production of defence equipment or goods,
 - ✓Operation or maintenance of industrial establishments or units engaged in such production, or
 - ✓Repair or maintenance of products connected with defence.

5. If any of the fundamental rights is violated, a person can approach the Supreme Court as per the provisions mentioned under which one of the following articles?

- A. Article 44
- B. Article 32
- C. Article 15
- D. Article 226

Answer: B

Explanation

- Article 32 deals with the 'Right to Constitutional Remedies', or affirms the right to move the Supreme Court by appropriate proceedings for the enforcement of the rights conferred in Part III of the Constitution.

- It states that the Supreme Court "shall have power to issue directions or orders or writs, including writs in the nature of habeas corpus, mandamus, prohibition, quo warranto and certiorari, whichever may be appropriate, for the enforcement of any of the rights conferred by this Part".
- The right guaranteed by this Article "shall not be suspended except as otherwise provided for by this Constitution".

4. Economy

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1. Consider the following statement with reference to the structure of India's debt:

1. The public debt to GDP ratio, which was around 66-68 per cent for many years, is now expected to jump to 80 per cent plus in 2020-21.
2. The external debt to GDP ratio increased to 21.1 per cent at end-March 2021.
3. The state government is responsible for 20% of India's total debt.

Which of the statements given above is/are correct?

- A. 1 and 2 only
- B. 2 and 3 only
- C. 3 only
- D. 1, 2 and 3 only

Answer: A

Explanation

- At end-March 2021, India's external debt was placed at US\$ 570.0 billion, recording an increase of US\$ 11.5 billion over its level at end-March 2020.

Structure Of India's Debt

- At end-March 2021, long-term debt (with original maturity of above one year) was placed at US\$ 468.9 billion, recording an increase of US\$ 17.3 billion over its level at end-March 2020.

- The share of short-term debt (with original maturity of up to one year) in total external debt declined to 17.7 per cent at end-March 2021 from 19.1 per cent at end-March 2020.

What is Debt-to-GDP ratio?

- The debt-to-GDP ratio indicates how likely the country can pay off its debt.
- Investors often look at the debt-to-GDP metric to assess the government's ability of finance its debt. Higher debt-to-GDP ratios have fueled economic crises worldwide.
- The Government's debt portfolio is characterized by very low foreign exchange risk as the external debt is only 2.7 percent of GDP (5.9 per cent of total Central Government liabilities).

Is there an acceptable level of debt-to-GDP?

- The NK Singh Committee on FRBM had envisaged a debt-to- GDP ratio of 40 per cent for the central government and 20 per cent for states aiming for a total of 60 per cent general government debt-to-GDP.
- Of the total public debt, 70 per cent is held by the Centre and 30 percent by the states.

2. Which one of the following State subjects has the 15th Finance Commission recommended moving to the Concurrent List of the 7th Schedule?

- A. Health
- B. Agriculture
- C. Public Order
- D. Betting and Gambling

Answer: A

Explanation

- Fifteenth Finance Commission Chairman N.K. Singh said that health should be shifted to the Concurrent list under the Constitution. Presently, 'Health' is under the State List. Additional info:
- The subject-wise distribution of legislative power is given in the three lists of the Seventh Schedule of the Constitution:
 - ✓ List-I- the Union List
 - ✓ List-II- the State List
 - ✓ List-III- the Concurrent List
- Both, the Parliament and state legislature can make laws with respect to any of the matters enumerated in the Concurrent List.
- It includes the matters on which uniformity of legislation throughout the country is desirable but not essential.
- However State legislation operates to the extent that it is not in conflict with the Central legislation.

- At times, the very presence of a central legislation can negate the state's ability to legislate.
- The 42nd Amendment Act of 1976 transferred five subjects to Concurrent List from State List i.e. education, forests, weights and measures, protection of wild animals and birds, and administration of justice; constitution and organisation of all courts except the Supreme Court and the High Courts.

3. Consider the following statements.

1. An IMF member has to agree to conditions or pay a service fee to access reserve tranche.
2. The interest rate on SDRs or (SDRi) is the interest paid to members on their SDR holdings.

Which of the above statements is/are correct?

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

Answer: B

Explanation

- Reserve Position in the International Monetary Fund implies a portion of the required quota of currency each member country must provide to the IMF that can be utilized for its own purposes.

- The reserve tranche is basically an emergency account that IMF members can access at any time without agreeing to conditions or paying a service fee.
- Special Drawing Rights is an international reserve asset, created by the IMF in 1969 to supplement its member countries' official reserves.
- The SDR is neither a currency nor a claim on the IMF. Rather, it is a potential claim on the freely usable currencies of IMF members.
- SDRs can be exchanged for these currencies.
- The value of the SDR is calculated from a weighted basket of major currencies, including the US dollar, the euro, Japanese yen, Chinese yuan, and British pound.
- The interest rate on SDRs or (SDRi) is the interest paid to members on their SDR holdings.
- India's Forex Reserve include: Foreign Currency Assets; Gold reserves; Special Drawing Rights; Reserve position with the International Monetary Fund (IMF).
- 1 Special drawing Right
✓ 105.58 Indian Rupee

4. Which of the following statements is incorrect with reference to Green Bonds?

- A. These instruments are designed specifically for funds to support specific projects benefiting the environment.
- B. The World Bank issued the first official green bond in 2009.
- C. State Bank of India had issued the first Green Infrastructure Bonds (GIBs) in India.
- D. None of the above

Answer: C

Explanation

About Green Bonds

- It is a debt instrument just like any other normal bond, issued by an issuer for raising funds.
- The only difference is that these instruments are designed specifically for funds to support specific projects benefiting the environment.
- Green bonds typically come with tax incentives to enhance their attractiveness to investors.
- The World Bank issued the first official green bond in 2009.
- Green Bonds in India:
 - ✓ Yes Bank was the first Indian Bank to issue Green Infrastructure Bonds (GIBs) in India in 2015.
 - ✓ SEBI has allocated the following eight categories with the tag of green projects:
 - ♣ renewable energy

- ❖ clean transportation
- ❖ sustainable water management
- ❖ climate change
- ❖ energy efficiency
- ❖ sustainable waste management and
- ❖ land use and
- ❖ biodiversity conservation.

5. Which one of the following committee was set up for restructuring of loans impacted by the Covid-19 pandemic?

- A. Kamath Committee
- B. Parekh Committee
- C. Manoharan Committee
- D. Bhanwala Committee

Answer: A

Explanation

- RBI had formed a five member committee under the chairmanship of former ICICI Bank CEO KV Kamath to make recommendations on the financial parameters to be considered for the one-time restructuring of loans impacted by the Covid 19 pandemic.
- The KV Kamath committee has selected 26 sectors which will require restructuring based on its analyses of financial parameters hit due to the economic crash caused by the Covid-19 pandemic.
- In its report the five member committee said power, construction, iron and steel, roads, real estate, wholesale trading, textiles, consumer durables, aviation, logistics, hotels, restaurants and tourism, mining are among the sectors that will need restructuring.

5. Environment

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1. Consider the following statements with respect to Coral Reefs.

1. Coral reefs are naturally colorful because of algae, which lives inside of the coral, providing them with food.
2. Coral reefs cover less than 1% of the ocean but are home to almost 25% of all known marine species.
3. ReefWatch Marine Conservation is an agency under Ministry of Environment, Forest and Climate Change working on marine conservation since 1993.

Which of the above statements is/are correct?

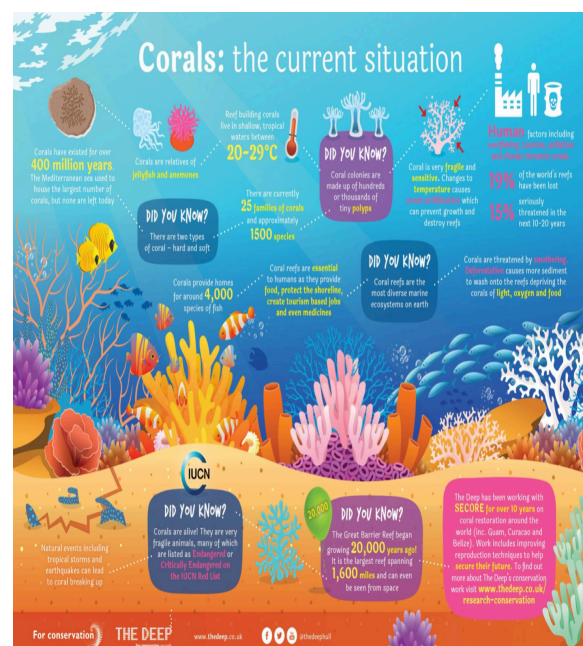
- A. 1 only
- B. 2 and 3 only
- C. 1 and 2 only
- D. 1 and 3 only

Answer: C

Explanation

- Coral reefs are unique and the most diverse marine ecosystems on Earth. They are believed to have existed for about 200 million years. It is estimated that it took corals about 50 million years to reach their present level of diversity.
- They play a crucial role in supporting the flora and fauna in the marine ecosystem.

- They have, since time immemorial, provided us with food, pleasure and protection from storm and other natural calamities.
- Known as “rainforests of the sea,” coral reefs cover less than 1% of the ocean but are home to almost 25% of all known marine species.
- Coral reefs are the largest structures on earth of biological origin.
- Coral reefs are naturally colorful because of algae, which lives inside of the coral, providing them with food.
- The three main types of coral reefs are fringing reefs, barrier reefs, and coral atolls.
- ReefWatch Marine Conservation is an Indian NGO in the Andaman islands working on marine conservation since 1993.



2. Which of the following is true about Limiting Factors in Ecology?

1. Limiting factor causes competition between individuals of a species population.
2. Extreme Sunlight in the rain forest is a limiting factor.
3. Moisture in the rain forest is a limiting factor.

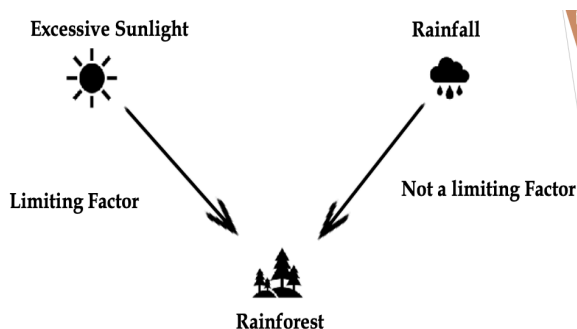
Choose the correct code.

- A. 1 and 3 only
- B. 1 and 2 only
- C. 2 and 3 only
- D. All are correct

Answer: B

Explanation

- In ecology, common limiting factor resources are environmental conditions that limit the growth, abundance, or distribution of an organism or a population of organisms in an ecosystem.
- The limiting factor also causes competition between individuals of a species population.
- For example, space is a limiting factor, Sunlight in the rain forest is a limiting factor for plants at the floor, etc. But moisture in the rain forest is not a limiting factor as it fairly abundant.



3. Recently few species were spotted for the first time in India. Consider the following pairs with respect to the same.

Species : First sighted in

1. Himalayan serow : Jammu and Kashmir
2. The Striped Hairstreak : Arunachal Pradesh
3. Willow warbler : Eastern Ghats

Which of the above pairs are incorrect?

- A. 1 and 2 only
- B. 2 and 3 only
- C. 1 and 3 only
- D. 1, 2 and 3

Answer: C

Explanation

- A Himalayan serow has been sighted for the first time in the Himalayan cold desert region.



- A biologist has described a Himalayan serow as resembling a cross between a goat, a donkey, a cow, and a pig.
- It's a medium-sized mammal with a large head, thick neck, short limbs, long, mule-like ears, and a coat of dark hair.
- Himalayan serows are herbivores, and are typically found at altitudes between 2,000 metres and 4,000 metres (6,500 to 13,000 feet).

- They are known to be found in eastern, central, and western Himalayas, but not in the Trans Himalayan region.
- The Striped Hairstreak (Yamamotozephyrus kwangtugenesis) was located in Vijaynagar (Arunachal Pradesh) bordering Myanmar.
- It was first recorded by Japanese entomologists in Hainan province of China.



- India now has 1,327 species of butterflies, up from 1,318 in 2015.
- Willow warbler has been sighted for the first time in the country in Thiruvananthapuram.
- It is the longest migrating bird in the 10 gms Warblers weight category.
- Willow Warbler is very difficult to identify as it is quite small and the plumage colour changes twice a year.



4. Ramadevarabetta Vulture Sanctuary, India's only vulture sanctuary is present in which of the following states?

- A. Madhya Pradesh
- B. Tamil Nadu
- C. Kerala
- D. Karnataka

Answer: D

Explanation

- India's only vulture sanctuary, Ramadevarabetta Vulture Sanctuary in Ramanagara district of Karnataka, has finally got its much-needed protective barrier and notified as an eco-sensitive zone (ESZ).
- Being very close to Bengaluru, the granite rocky hills have witnessed an indiscriminate expansion of industries and real estate activity in the last few years.
- The Central Government has notified an area from 1.30 metres to 1.80 km from the boundary of the 346- hectare area sanctuary.
- The total geographical area of the ESZ is 7.08 sq km and covers a total of six villages and one hamlet.
- It is the only place in Karnataka where the critically endangered and endemic Indian white backed vulture and long-billed vultures are found and breed naturally in the entire South.
- A rescue centre for vultures will be set up in the Bihar's Valmiki Tiger reserve's Ganauli range to increase the number of vultures.

5. In recent years, The Himalayan trillium has become one of the most traded commercial plants of the Himalayan region, due to which one of the following reason?

- A. Use in textile fibre
- B. Use in Bio-diesel
- C. Pulp for paper industry
- D. High medicinal quality

Answer: D

Explanation

- The Himalayan trillium – found across India, Bhutan, Nepal and China – is a natural source of steroidal saponins which are important components of steroidal drugs.
- The plant is popular in traditional Chinese medicine.
- The Himalayan trillium, a common herb of the Himalayas was declared 'endangered' by the International Union for Conservation of Nature (IUCN).
- Increased demands over the last decade has made its illegal collection from the wild a rather lucrative business in India: a kilogram fetches about Rs.3,000-5,000.



6. Science & Technology

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1. Recently, the Department of Space (DoS) has signed an MoU with geospatial technology company, CE Info Systems Pvt Ltd. Consider the following statements with respect to the same.

1. The collaboration will enable them to jointly identify and build a holistic geospatial portal utilising earth observation datasets.
2. Bhuvan is a data repository for all the meteorological missions of ISRO and deals with weather-related information, oceanography, and tropical water cycles.

Which of the above statements is/are correct?

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

Answer: A

Explanation

- Department of Space entered into an MoU with M/s CE Info Systems Pvt Ltd., an Indian Geospatial Technology company developing location based Software Service and AI based solutions.
- Through the MoU, the combined geospatial expertise of the Department and CE Info Systems will be leveraged through their respective Geoportals.

- The collaboration will enable them to jointly identify and build a holistic geospatial portal utilising earth observation datasets, 'NavIC', Web Services and APIs (application programming interface) available in Mapmy India,
- The geospatial portals will be called 'Bhuvan', 'VEDAS' and 'MOSDAC'.
- Indian Regional Navigation Satellite System also known as NavIC (Navigation with Indian Constellation), is an indigenous navigation system, developed by ISRO.
- Bhuvan is the national geo-portal developed and hosted by ISRO comprising geospatial data, services, and tools for analysis.
- VEDAS (Visualisation of Earth observation Data and Archival System) is an online geo processing platform that uses optical, microwave, thermal, and hyper-spectral EO data covering applications particularly meant for academia, research and problem solving, ISRO said.
- MOSDAC (Meteorological and Oceanographic Satellite Data Archival Centre) is a data repository for all the meteorological missions of ISRO and deals with weather-related information, oceanography, and tropical water cycles.

2. NASA and ISRO are collaborating on developing a satellite called NISAR. Consider the following statements with respect to the same.

1. NISAR will be launched from Kennedy Space Center, Florida.
2. It will scan the globe every 12 days over the course of its seven-year mission.

Which of the above statements is/are incorrect?

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

Answer: C

Explanation

- Using advanced radar imaging that will provide an unprecedented, detailed view of Earth, the NASA-ISRO Synthetic Aperture Radar, or NISAR, satellite is designed to observe and take measurements of some of the planet's most complex processes.
- These include ecosystem disturbances, ice-sheet collapse, and natural hazards such as earthquakes, tsunamis, volcanoes and landslides.
- Data collected from NISAR will reveal information about the evolution and state of Earth's crust, help scientists better understand our planet's processes and changing climate, and aid future resource and hazard management.

3. Which of the following countries have their own self-developed space station in service?

1. Japan
2. China
3. Russia

Select the correct code.

- A. 1 and 2 only
- B. 3 only
- C. 2 only
- D. 2 and 3 only

Answer: C

Explanation

- China launched the first astronauts to its self-developed space station's core module Tianhe for a three-month mission.
- The new multi-module Tiangong station is set to be operational for at least 10 years.
- Tianhe is one of three main components of what would be China's first self-developed space station, rivalling the only other station in service – the ISS.
- Tianhe will act “the management and control hub of the space station”.
- The ISS consists of Canada, Japan, the Russian Federation, the United States, and eleven Member States of the European Space Agency.
- Aside from the ISS, three nations (U.S., Russia and China) have independently launched and operated space stations.

✓ Soviet Space Program Salyut 1, 3-7: Beginning with Salyut 1 in 1971, the Soviet Space Program launched and operated six more stations, culminating in Salyut 7, which operated for nearly 9 years.

✓ NASA Skylab: The United States' first space station, Skylab was visited three times from 1973-1979.

✓ Soviet Space Program Mir: Mir was the first modular space station. Beginning in 1986, it remained in use for 15 years, first by the Soviet Space Program and later by the Russian space program.

✓ CNSA Tiangong 1 and 2: China's first experimental space stations launched in 2011 and 2016, respectively.

4. **The Canadian Hydrogen Intensity Mapping Experiment (CHIME) has detected 535 new fast radio bursts during its first year of operation. Consider the following statements with respect to the same.**

1. FRBs are radio pulses that look like light flashes and last for a fraction of a millisecond, and which can glow anytime.
2. CHIME has successfully traced the origin of FRBs to black holes.
3. CHIME is located at Dominion Radio Astrophysical Observatory in British Columbia.

Which of the above statements is/are correct?

A. 1 and 2 only

B. 3 only

C. 1 and 3 only

D. 2 and 3 only

Answer: C

Explanation

- Located at the Dominion Radio Astrophysical Observatory in British Columbia in Canada, scientists used the radio telescope Canadian Hydrogen Intensity Mapping Experiment (CHIME) to carry out its maiden sky scanning after it became operational in 2018.
- FRBs are oddly bright flashes of light, registering in the radio band of the electromagnetic spectrum, which blaze for a few milliseconds before vanishing without a trace.
- These brief and mysterious beacons have been spotted in various and distant parts of the universe, as well as in our own galaxy.
- Their origins are unknown and their appearance is highly unpredictable.

5. **Which of the following has been selected by ESA as its next orbiter that will visit Venus sometime in the 2030s?**

- A. Venus Express
- B. Venera 15
- C. EnVision
- D. Mariner 10

Answer: C

Explanation

- EnVision will be ESA's next Venus orbiter, providing a holistic view of the planet from its inner core to upper atmosphere to determine how and why Venus and Earth evolved so differently.
- The mission was selected by ESA's Science Programme Committee on 10 June as the fifth medium-class mission in the Agency's Cosmic Vision plan, targeting a launch in the early 2030s.
- It will be an ESA led mission with contributions from NASA.
- It will be launched on an Ariane 6 rocket, the spacecraft will take about 15 months to reach Venus and will take 16 more months to achieve orbit circularisation.