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Prelims
GS Paper–I

UPSC
Civil Services Examination

Previous 13 Years' (2008-20)

Topic-wise Solved Question Papers

Highlights

- Solutions as per the Official UPSC Answer Key
- Detailed Explanations for Comprehensive Coverage
- Unique Option Centric Approach
- Trend Analysis of Past 13 Years' Question Papers
- Detailed Analysis of 2020 Prelims GS Question Paper

UPSC CSE (PRELIMS) PREVIOUS 13 YEARS' SOLVED PAPERS (2008-2020)

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UPSC CSE (PRE) 2020
GS PAPER-I

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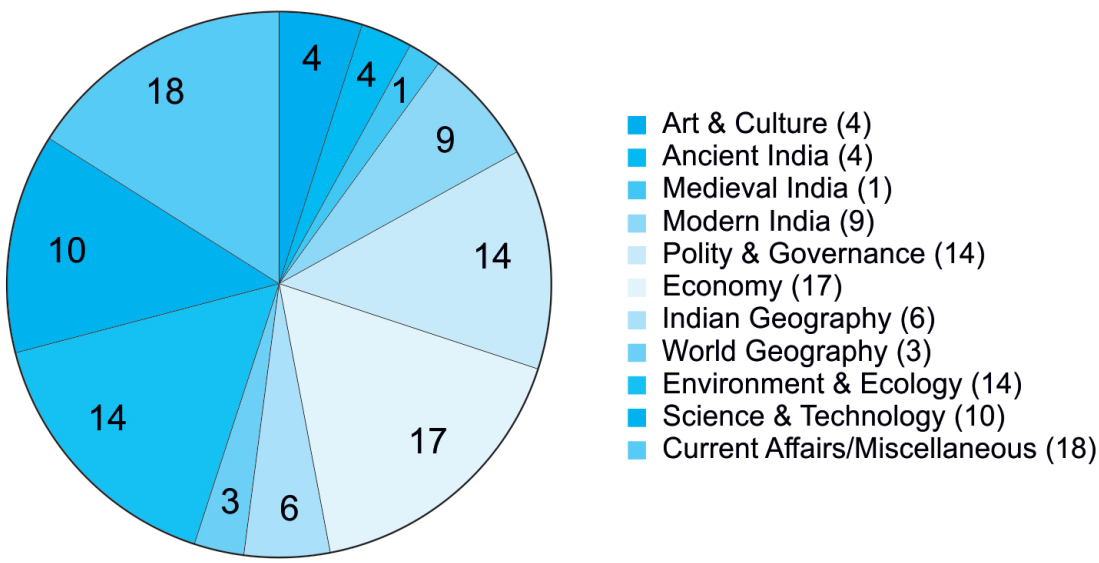


Subject-wise Distribution of Questions

UPSC CSE (PRE) 2020
GS PAPER-I

1. With reference to carbon nanotubes, consider the following statements:
   1. They can be used as carriers of drugs and antigens in the human body.
   2. They can be made into artificial blood capillaries for an injured part of human body.
   3. They can be used in biochemical sensors.
   4. Carbon nanotubes are biodegradable.

   Which of the statements given above are correct?
   (a) 1 and 2 only (b) 2, 3 and 4 only
   (c) 1, 3 and 4 only (d) 1, 2, 3 and 4

Ans: (d)

- Carbon nanotubes (CNTs) are cylindrical molecules consisting of a hexagonal arrangement of hybridized carbon atoms, which may be formed by rolling up sheet(s) of graphene.
- In recent years, carbon nanotubes have attracted many researchers as a drug delivery carrier. As carbon nanotubes have a high surface area, they go into the cell by the millions, and can have a very high efficiency of delivery to a specific cell. **Hence, statement 1 is correct.**
- Carbon nanotubes can be made into artificial blood capillaries for an injured part of the human body as they are promising drug delivery platforms that can be functionalized with a variety of biomolecules, such as antibodies, proteins, or DNA. **Hence, statement 2 is correct.**
- Recently, NASA has demonstrated Biochemical Sensors Using Carbon Nanotube Arrays. **Hence, statement 3 is correct.**
- Multiple types of microbes, including bacteria and fungi, have the ability to degrade carbon nanotubes (CNTs). **Hence, statement 4 is correct.**

Therefore, option (d) is the correct answer.

2. Consider the following activities:
   1. Spraying pesticides on a crop field
   2. Inspecting the craters of active volcanoes
   3. Collecting breath samples from spouting whales for DNA analysis

   At the present level of technology, which of the above activities can be successfully carried out by using drones?
   (a) 1 and 2 only (b) 2 and 3 only
   (c) 1 and 3 only (d) 1, 2 and 3

Ans: (d)

- Unmanned Aerial Vehicles (UAV) or drones are aircrafts that can be navigated without a human pilot on board. Drones can be navigated via control from the ground, using a GPS tracking system.
- Initially, drones have been developed mostly for military applications. However, its use has expanded to scientific, recreational, commercial and other applications including peacekeeping and surveillance, product delivery, aerial photography, agriculture, etc.
- They are now increasingly used to spray pesticides in agricultural fields to protect standing crops from pests. **Hence, statement 1 is correct.**
- Scientists have also been using drones to study active volcanoes. The drone can both collect breath samples and take high-resolution photos of the whales from the air to assess general health conditions. **Hence, statement 2 and 3 are correct.**

Therefore, option (d) is the correct answer.

3. "The experiment will employ a trio of spacecraft flying in formation in the shape of an equilateral triangle that has sides one million kilometres long, with lasers shining between the craft."
   The experiment in question refers to
   (a) Voyager-2
   (b) New Horizons
   (c) LISA Pathfinder
   (d) Evolved LISA

Ans: (d)

- Evolved Laser Interferometer Space Antenna (eLISA) is a spectacular plan of setting into space three spacecrafts, a mother and two daughter spacecrafts, which will fly in a triangular formation, trailing the earth in its orbit around the sun at a distance of over

50 million km. Each arm of the imaginary triangle, from the mother to each daughter spacecraft, will measure about a million km.

- eLISA seeks to measure gravitational waves in the frequency range from 0.1 mHz to about 100 mHz. To achieve this, it is necessary for the interferometers to have an arm length of a million kilometres and that is impossible to achieve with an earth based setup.

Therefore, option (d) is the correct answer.

4. Consider the following statements:
    1. Genetic changes can be introduced in the cells that produce eggs or sperms of a prospective parent.
    2. A person's genome can be edited before birth at the early embryonic stage.
    3. Human induced pluripotent stem cells can be injected into the embryo of a pig.

    Which of the statements given above is/are correct?
    (a) 1 only
    (b) 2 and 3 only
    (c) 2 only
    (d) 1, 2 and 3

Ans: (d)

- Germline gene therapy is the replacement of genes in egg or sperm cells with which an offspring inherits a new trait. It allows for the correction of disease-causing gene variants that are certain to be passed down from generation to generation. **Hence, statement 1 is correct.**
- CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) technology is employed to modify human embryos before they are transferred into women's uterus. Recently, researchers had successfully created the world's first genetically-edited baby. By using CRISPR technology, the genomes of embryos were edited to disable a gene, CCR5, which allows HIV to infect cells. **Hence, statement 2 is correct.**
- Due to certain anatomical and physiological features shared with humans, the pig is considered an important animal model of human diseases with unique advantages in surgery and xenotransplantation studies. **Hence, statement 3 is correct.**

Therefore, option (d) is the correct answer.

5. What is the importance of using Pneumococcal Conjugate Vaccines in India?
    1. These vaccines are effective against pneumonia as well as meningitis and sepsis.
    2. Dependence on antibiotics that are not effective against drug-resistant bacteria can be reduced.
    3. These vaccines have no side effects and cause no allergic reactions.

    Select the correct answer using the code given below:
    (a) 1 only
    (b) 1 and 2 only
    (c) 3 only
    (d) 1, 2 and 3

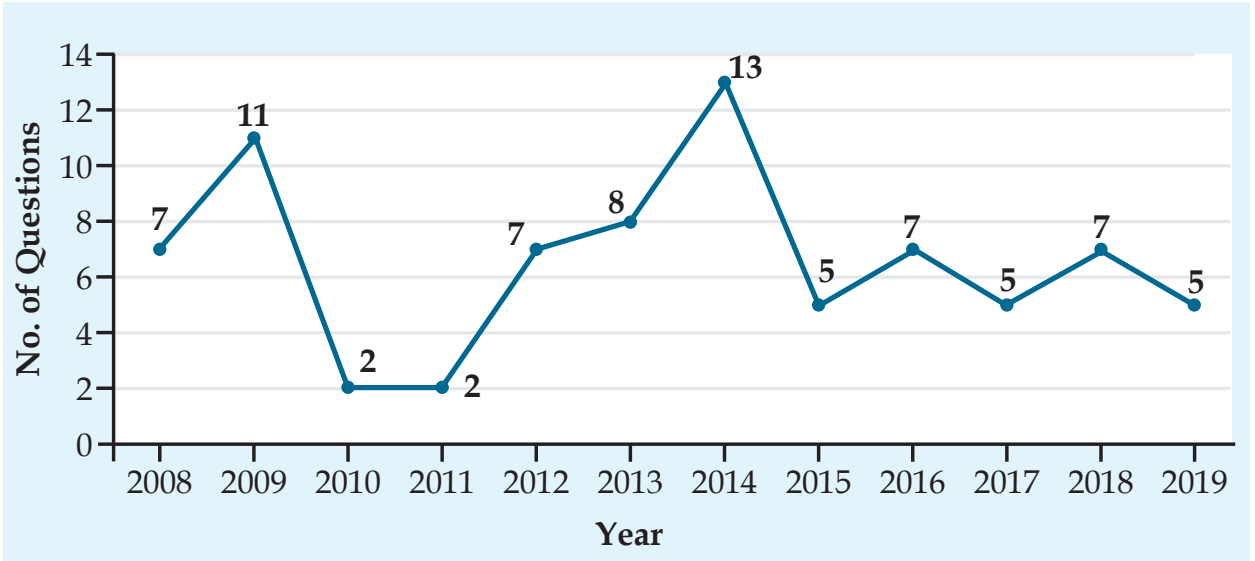
Ans: (b)

- Pneumococcal Conjugate Vaccines (PCVs) prevent pneumococcal diseases. Pneumococcal disease refers to any illness caused by pneumococcal bacteria. Streptococcus pneumoniae (pneumococcus) is a leading cause of bacterial pneumonia, meningitis and sepsis in children.
- PCVs could potentially prevent a substantial proportion of episodes of bacteremic disease, pneumonia, meningitis, sepsis and otitis media, especially in young children. **Hence, statement 1 is correct.**
- The growing resistance of pneumococcal bacteria to commonly used antibiotics underlines the urgent need for vaccines to be used to control pneumococcal disease. PCV prevents antibiotic resistant pneumococcal infections. **Hence, statement 2 is correct.**
- Redness, swelling, pain, or tenderness where the shot is given, and fever, loss of appetite, fussiness (irritability), feeling tired, headache and chills can happen. **Hence, statement 3 is not correct.**

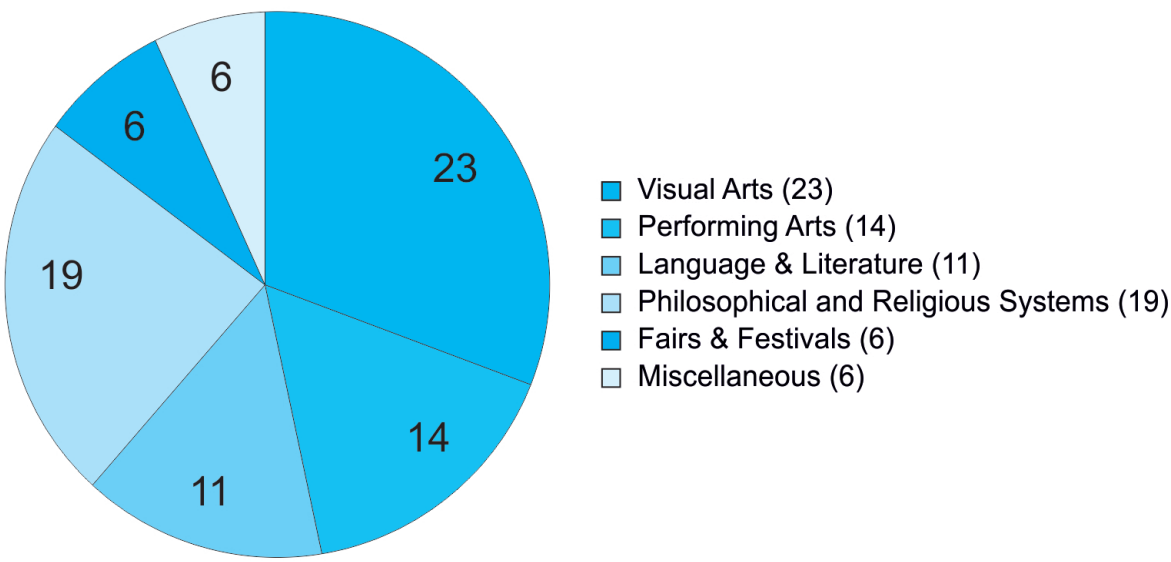
Therefore, option (b) is the correct answer.

6. In India, the term "Public Key Infrastructure" is used in the context of
    (a) Digital security infrastructure
    (b) Food security infrastructure
    (c) Health care and education infrastructure
    (d) Telecommunication and transportation infrastructure

ART & CULTURE



Year-wise Trend of Questions



Topic-wise Distribution of Questions (2008-2019)

1 ART & CULTURE

VISUAL ARTS

1. Building 'Kalyaana Mandapas' was a notable feature in the temple construction in the kingdom of (2019)

(a) Chalukya (b) Chandela
(c) Rashtrakuta (d) Vijayanagara

Ans: (d)

- Temples of Vijayanagara, centred around Hampi, have the feature of 'Kalyaana Mandapa'.
- One of the greatest monuments of the Vijayanagara period, which dates back to the 16th century, is the Vitthala Temple.
- The Vitthala Temple is built with a spacious courtyard within a walled enclosure with three massive gateways adorned by lofty Gopuras in the north, east and south. In the courtyard are located the main shrine, Devi shrine, Kalyana Mandapa, Utsava Mandapa, a hundred pillared Mandapa and a stone Ratha.
- The Kalyana Mandapa, an open pavilion, was used for ceremonies involving the symbolic marriage of the temple's deity to his consort. Its interior is surrounded by impressive columns and contains a platform in the centre for the performance of sacred dances.

Therefore, option (d) is the correct answer.

2. Consider the following pairs: (2018)

Craft		Heritage of
1. Puthukkuli shawls	–	Tamil Nadu
2. Sujni embroidery	–	Maharashtra
3. Uppada Jamdani saris	–	Karnataka

Which of the pairs given above is/are correct?

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

Ans: (a)

- **Puthukkuli Shawls:** The embroidered textile of the Todas is used as a mantle/shawl or cloak and is called Putkuli in the Toda native language. It is made by Todas of Nilgiri Hills in Tamil Nadu. Locally called Pugur, meaning flower, the fine and intricate Toda embroidery is done by tribal men and women on shawls. **Hence, pair 1 is correctly matched.**
- **Sujni Embroidery:** Also known as Sujani, it is a form of embroidery originating from the Bhusura village of Bihar in India. In ancient times, it was considered as a form of quilting wherein old saris and dhotis were used as a creative canvas, the cloth was folded twice or thrice and then simple stitches were done on these used clothing to add newness to them. **Hence, pair 2 is not correctly matched.**
- **Uppada Jamdani Saris:** These are diaphanous silk saris that trace their origin to Uppada in Andhra Pradesh. Jamdani itself is a hand woven fabric that is also known as muslin. The word Jamdani roughly translates to flower vase (where 'Jam' means flower and 'Dani' means vase). It is also said that this technique of weaving has Bengali roots. **Hence, pair 3 is not correctly matched.**

Therefore, option (a) is the correct answer.

3. With reference to the cultural history of India, consider the following statements: (2018)

1. White marble was used in making Buland Darwaza and Khankah at Fatehpur Sikri.
2. Red sandstone and marble were used in making Bara Imambara and Rumi Darwaza at Lucknow.

Which of the statements given above is/are correct?

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

Ans: (d)

- Buland Darwaza was built in 1601 AD by Akbar to commemorate his conquest of Gujarat. It is 40 metres high and 35 metres wide. The gateway is made of red sandstone and not with white marble. **Hence, statement 1 is not correct**.
- Shaikh Salim Chishti (1478-1572) was one of the most revered Sufi saints of the Mughal period. His Khanqah (Khankah), or hospice is located near Fatehpur Sikri –

which is a simple prayer hall. In 1571, Akbar commissioned tomb of Sufi saint Shaikh Salim Chishti within the Friday Mosque complex at Fatehpur Sikri, which is a white marble structure ornamented and inspired by Gujarati tomb architecture, and includes Hindu, Jain and Islamic elements. Thus, it is the tomb of Shaikh Salim Chishti which saw the use of white marble.

- In 1784, the province of Awadh was struck by a famine of an unprecedented scale. The ruler of Awadh, Nawab Asaf-ud-Daula, came up with a novel way of generating employment. He summoned the best architects of the time and commissioned them to design a grand prayer hall for the city of Lucknow – the Bara Imambara. The whole building was made of Lucknowi bricks and lime plaster. No wood or metal had been used for the construction.
- Rumi Darwaza of Lucknow was constructed in the year 1784 by Nawab Asaf-ud-Daula. It is also known by the name of Turkish Gateway since it is supposed to be identical in design to a similar gateway in ancient Constantinople. Red sand stone and marble have not been used in its construction. **Hence, statement 2 is not correct.**

Therefore, option (d) is the correct answer.

4. The well-known painting "Bani Thani" belongs to the **(2018)**

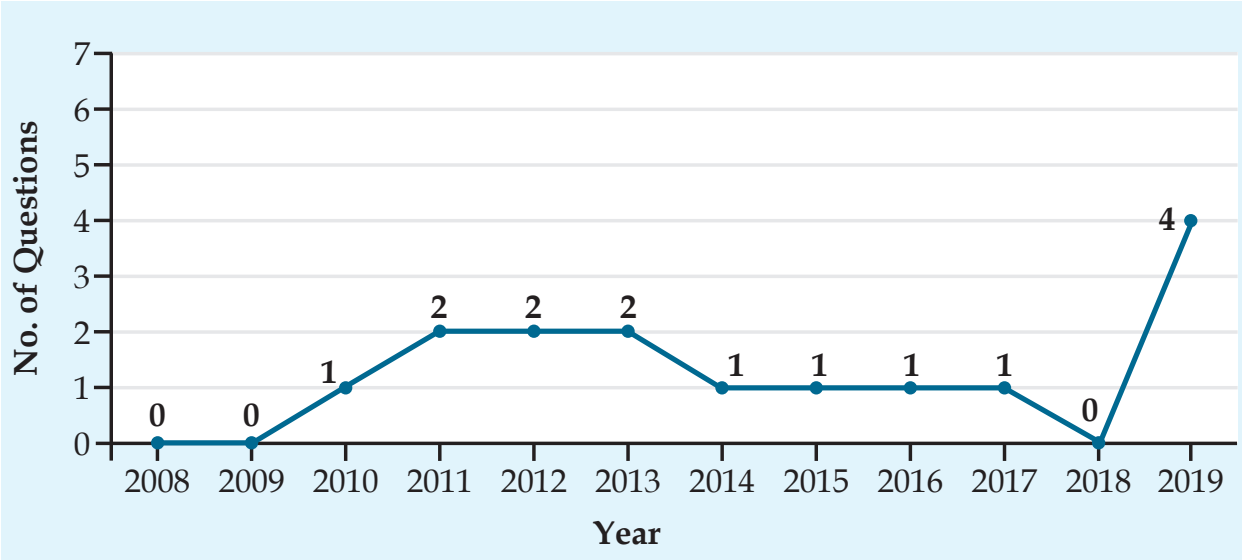
(a) Bundi school (b) Jaipur school
(c) Kangra school (d) Kishangarh school

Ans: (d)

- **Kishangarh School**
  - Bani Thani painting belongs to the Kishangarh School. Kishangarh School (18th century) of Indian painting emerged in the Princely State of Kishangarh (Central Rajasthan).
  - The school is clearly distinguished by its individualistic facial type and its religious intensity. The sensitive, refined features of the men and women are drawn with pointed noses and chins, deeply curved eyes, and serpentine locks of hair.
  - The brilliant series of paintings on the Radha–Krishna theme were due largely to the inspiration of Raja Savant Singh (reigned 1748–57). He was a poet also, who wrote under the name of Nagari Das.
  - The master artist largely responsible for transmitting the romantic and religious passions of his patron (i.e., Raja Savant Singh) into new and fresh visual images was Nihal Chand.
- **Kangra School**
  - Around mid-18th century, as forces of Nadir Shah (1739) and Ahmad Shah Abdali (1744-1773) pillaged the Mughal capital of Delhi and surrounding areas, the birth of the Kangra School of painting at Haripur-Guler under the patronage of Raja Govardhan Chand (1744-1773) took place as he provided asylum to refugee artists trained in the Mughal style of painting.
  - Kangra painting is named after Kangra (Himachal Pradesh), a former Princely State.
  - These artists who were traditionally trained in the Mughal style (which predominately featured flattering portraits of their patrons and hunting scenes), now incorporated themes from the love poetry of Jayadeva, Bihari and Keshav Das who wrote ecstatically of the love of Radha and Krishna.
- **Bundi School**
  - Between 17th-19th century, Bundi School of painting developed in the Princely State of Bundi and its neighbouring principality of Kotah (now Kota) both in present-day Rajasthan.
  - Its characteristic features are dramatic night skies, distinct of depicting water by light swirls against a dark background with special focus on highlighting lush vegetation.
  - The painting style reached its peak during the first half of the 18th century, but continued to flourish into the 19th century and had found exceptional patron like Maharao Ram Singh II (1828–66) under whom the art witnessed its brilliant phase.
  - One of the earliest examples of the Bundi paintings is the Chunar Ragamala painted in 1561.
  - Bundi paintings emphasized on hunting, court scenes, festivals, processions, life of nobles, lovers, animals, birds and scenes from Lord Krishna's life.
- **Jaipur School**
  - As the rulers of Jaipur (Amer) Princely State had close affiliation with the Mughals, the art which developed between the late 16th and early 18th century had syncretic elements of both Rajasthani style (which predominated the art style between 16th-17th century) and Mughal style.
  - With patronage of rulers like Savai Jai Singh and Pratap Singh, splendid portraits (aristocratic in nature) and large paintings centred around Lord Krishna became a signature of Rajasthani style.

Therefore, option (d) is the correct answer.

ANCIENT INDIA



Year-wise Trend of Questions

Note: The topic-wise distribution of questions has not been done owing to the lesser number of questions from the subject.

2 ANCIENT INDIA

1. Which one of the following is ***not*** a Harappan site? **(2019)**

(a) Chanhudaro (b) Kot Diji
(c) Sohgaura (d) Desalpur

Ans: (c)

- Kot Diji (now in the Sindh region of Pakistan) was an early Harappan site on the east bank of the Indus river and was excavated between 1955 and 1957.
- Chanhudaro in Pakistan and Desalpur in Gujarat are mature Harappan sites.
- Sohgaura in Gorakhpur, Uttar Pradesh, is known for Sohgaura copper plate inscription which is considered to be from the Mauryan period. It is not a Harappan site.

Therefore, option (c) is the correct answer.

2. In which of the following relief sculpture inscriptions is 'Ranyo Ashoka' (King Ashoka) mentioned along with the stone portrait of Ashoka? **(2019)**

(a) Kanganahalli (b) Sanchi
(c) Shahbazgarhi (d) Sohgaura

Ans: (a)

- The Archaeological Survey of India (ASI) unearthed a panel at Kanaganahalli in Karnataka that depicts the emperor Ashoka with his queen surrounded by several women.
- This slab is inscribed in Brahmi Script with the words 'Ranyo Ashoka' which means 'Ashoka the Great'.

Therefore, option (a) is the correct answer.

3. Consider the following: **(2019)**

1. Deification of the Buddha
2. Treading the path of Bodhisattvas
3. Image worship and rituals

Which of the above is/are the feature/features of Mahayana Buddhism?

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

Ans: (d)

- The fourth Buddhist Council held at Kundalvana, Kashmir in 72 AD, presided by Vasumitra saw Buddhism divide into two branches, Hinyana and Mahayana.
- Mahayana, literally translates to 'The Great Vehicle', whereas supporters of Mahayana Buddhism termed the older tradition of Buddhism as Hinyana (the lesser vehicle).
- Mahayana Buddhists professed the path of the Bodhisattva to attain enlightenment and to help all sentient beings from all sufferings and pain. **Hence, 2 is correct**.
- This school started believing that the Buddha was the saviour and he was the one who could ensure salvation. Thus, the process of deification of Buddha started. **Hence, 1 is correct**.
- Besides, the worship of images of the Buddha and rituals became an important part of Buddhist school. **Hence, 3 is correct**.

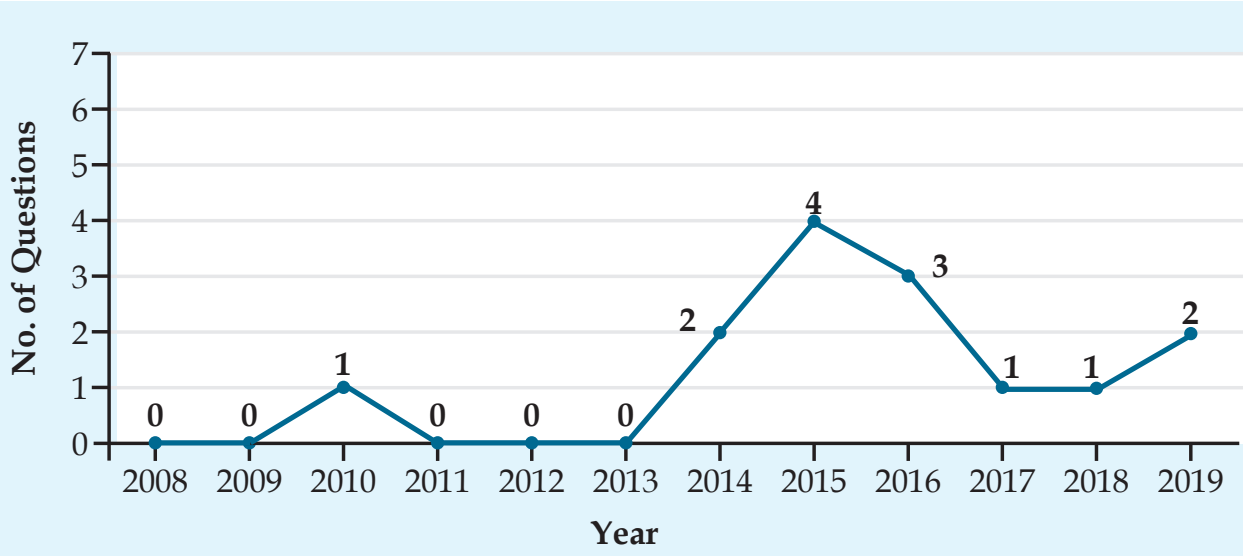
Therefore, option (d) is the correct answer.

4. With reference to forced labour (Vishti) in India during the Gupta period, which one of the following statements is correct? **(2019)**

(a) It was considered a source of income for the State, a sort of tax paid by the people.
(b) It was totally absent in the Madhya Pradesh and Kathiawar regions of the Gupta Empire.
(c) The forced labourer was entitled to weekly wages.
(d) The eldest son of the labourer was sent as the forced labourer.

Ans: (a)

- Earliest recorded reference of forced labour comes from Kautilya's Arthshastra which recommends ways to enhance production, such as newly established villages should consist of 100–500 families, mostly Shudras with the State extracting "Vishti" or forced labour from the people (in this period Vishti could also mean labour employed by the State or that provided by subjects in lieu of taxes).
- During Gupta period, Vishti became more frequent than before as land grants were accompanied by various taxes. One such tax was 'Vishti' that was being levied on forced labour which could be considered as a source of income for the State, a sort of tax paid by the people. The fact that most of the inscriptions



Year-wise Trend of Questions

Note: The topic-wise distribution of questions has not been done owing to the lesser number of questions from the subject.

3 MEDIEVAL INDIA

1. With reference to Mughal India, what is/are the difference/differences between Jagirdar and Zamindar? **(2019)**

1. Jagirdars were holders of land assignments in lieu of judicial and police duties, whereas Zamindars were holders of revenue rights without obligation to perform any duty other than revenue collection.
2. Land assignments to Jagirdars were hereditary and revenue rights of Zamindars were not hereditary.

Select the correct answer using the code given below.

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

Ans: (d)

- In Mughal India, Jagirdars under Mansabdari system were assigned land in lieu of assigned duties towards the empire such as police, judicial, military, etc., whereas Zamindars apart from revenue collection duties had to render military duties and perform Khidmat such as rendering soldiers to fill the ranks of the royal army in times of need and offer gifts at the royal court. **Hence, statement 1 is not correct.**
- Jagirdars were frequently transferred, as promotions and demotions were a regular part of the Mughal Empire, as loyalties towards the Emperor were largely dependent on the rank of Jagir/Mansab held by a noble. On the other hand, Zamindars had hereditary rights over the revenue as their sway over rural society was overarching in all aspects. **Hence, statement 2 is not correct.**

Therefore, option (d) is the correct answer.

2. Consider the following statements: **(2019)**

1. In the revenue administration of Delhi Sultanate, the in-charge of revenue collection was known as 'Amil'.
2. The lqta system of Sultans of Delhi was an ancient indigenous institution.
3. The office of 'Mir Bakshi' came into existence during the reign of Khalji Sultans of Delhi.

Which of the statements given above is/are correct?

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

Ans: (a)

- In the Delhi Sultanate, the task of collecting revenue directly from peasants and measurement of land rested on Amils. **Hence, statement 1 is correct.**
- Iqta system evolved in West Asia, particularly in Persia under the Buyid dynasty, which formalized the system and ruled during the 10th and 11th century. In India, the system was provided an institutional status by Iltutmish (Mamluk dynasty). Under the Iqta system, the land of the empire was divided into various tracts of land called Iqta which were assigned to officers known as 'Iqtadars' **Hence, statement 2 is not correct.**
- Ghiyas ud-din Balban (1266 -1287) had setup a military department called 'Diwan-i-arz', under which 'Ariz-i-mamalik' was responsible for the organization and maintenance of the royal army. Alauddin Khalji introduced 'Dagh' system (i.e. branding of horses) to improve horse quality as well as eliminate fake numbering to further enhance efficiency of Diwan-i-arz department. In contrast, Mir Bhakshi was the head of the military department during Mughal India. **Hence, statement 3 is not correct.**

Therefore, option (a) is the correct answer.

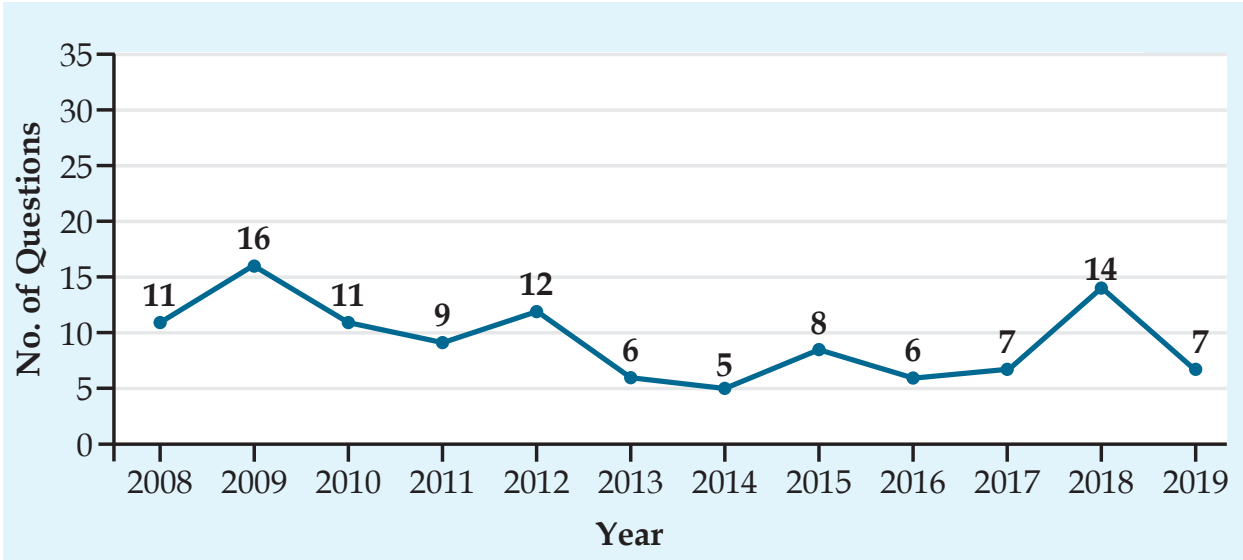
3. Which one of the following foreign travellers elaborately discussed about diamonds and diamond mines of India? **(2018)**

(a) Francois Bernier
(b) Jean-Baptiste Tavernier
(c) Jean de Thevenot
(d) Abbe Barthelemy Carre

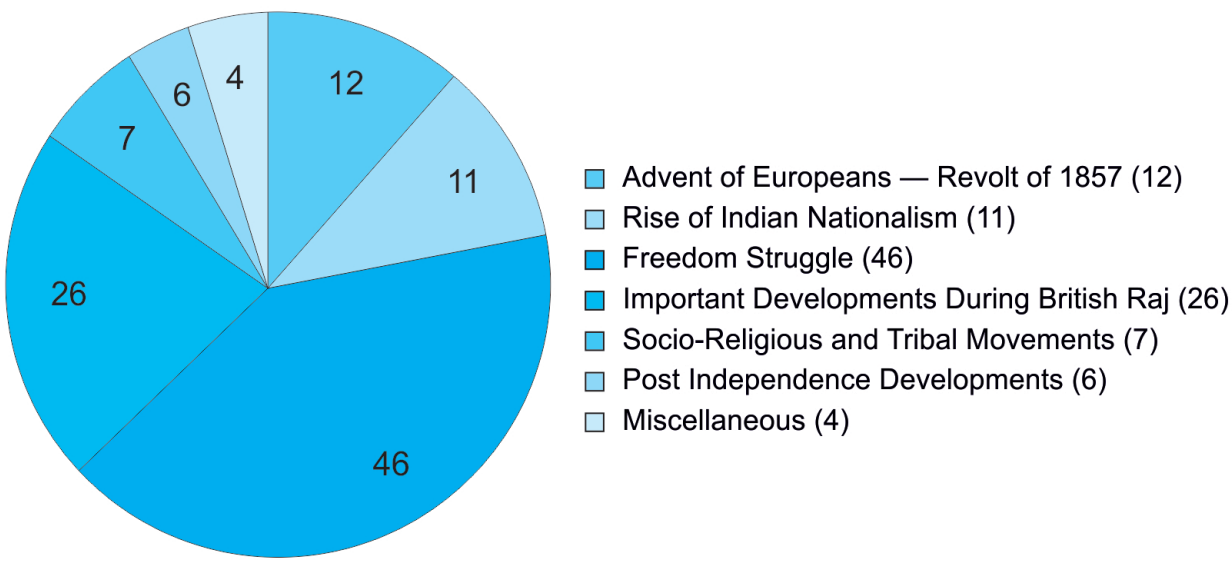
Ans: (b)

- Francois Bernier, a Frenchman, was a doctor, political philosopher and historian. Like many others, he came to the Mughal Empire in search of opportunities. He

MODERN INDIA



Year-wise Trend of Questions



Topic-wise Distribution of Questions (2008-2019)

4 MODERN INDIA

ADVENT OF EUROPEANS – REVOLT OF 1857

1. Which one of the following statements does ***not*** apply to the system of Subsidiary Alliance introduced by Lord Wellesley? **(2018)**

(a) To maintain a large standing army at other's expense
(b) To keep India safe from Napoleonic danger
(c) To secure a fixed income for the Company
(d) To establish British paramountcy over the Indian States

Ans: (c)

- The Subsidiary Alliance system was used by Lord Wellesley, who was Governor-General from 1798-1805. Actually, it was the French Governor Dupleix who first employed a similar system under which the local Indian Kingdoms were promised protection in lieu of a payment. But Wellesley developed it as a policy and applied it very systematically to contain the French influence as well as increase British power.
- **Key Features**
  - Under the system, the allying Indian State's ruler was compelled to accept the permanent stationing of a British force within his territory and to pay for its maintenance.
  - Indian ruler had to agree to the posting of a British Resident in his court.
  - Indian ruler could not employ any European in his service without the prior approval of the British.
  - Indian ruler could not negotiate with any other Indian ruler without consulting the Governor-General.
  - The British would defend the ruler from his enemies and adopt a policy of non-interference in the internal matters of the allied State.
  - From above points, it is clear that statement (a), (b) and (d) apply to the system of Subsidiary Alliance.

Therefore, option (c) is the correct answer.

2. The staple commodities of export by the English East India Company from Bengal in the middle of the 18th century were: **(2018)**

(a) Raw cotton, oil-seeds and opium
(b) Sugar, salt, zinc and lead
(c) Copper, silver, gold, spices and tea
(d) Cotton, silk, saltpetre and opium

Ans: (d)

- Through the mid-1700s and early 1800s, the English East India Company came to account for half of the world trade. They traded mainly in commodities exotic to Europe and Britain like cotton, indigo, salt, silk, saltpetre, opium and tea.
- Although initial interest of the Company was aimed simply at reaping profits, their single minded focus on establishing a trading monopoly throughout Asia-Pacific, made them the heralding agents of British colonial imperialism.

Therefore, option (d) is the correct answer.

3. Who among the following was/were associated with the introduction of Ryotwari Settlement in India during the British rule? **(2017)**

1. Lord Cornwallis
2. Alexander Read
3. Thomas Munro

Select the correct answer using the code given below:

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

Ans: (c)

- Land settlements introduced in India by the English East India Company are as follows:
- **Permanent Settlement (1793)**
  - It was introduced by Lord Cornwallis.
  - The Rajas and Taluqdars were recognised as zamindars and asked to collect rent from the peasants and pay revenue to the Company.
  - The amount to be paid was fixed permanently.

- **Mahalwari Settlement (1822)**
  - It was devised by Holt Mackenzie in the North Western Provinces (region of Agra, Oudh and Punjab).
  - Collectors went from village to village, inspecting the land, measuring the fields, and recording the customs and rights of different groups.
  - The estimated revenue of each plot within a village was added up to calculate the revenue that each village (Mahal) had to pay.
  - This demand was to be revised periodically.
  - The charge of collecting the revenue and paying it to the Company was given to the village headman, rather than the zamindar.
- **Ryotwari System (1820)**
  - It was started in South India by Captain Alexander Reed and Thomas Munro.
  - This system allowed the government to deal directly with the peasant (ryot) for revenue collection, and gave the peasant freedom to give up or acquire new land for cultivation.

Therefore, option (c) is the correct answer.

4. Consider the following: **(2012)**

1. Assessment of land revenue on the basis of nature of the soil and the quality of crops
2. Use of mobile cannons in warfare
3. Cultivation of tobacco and red chillies

Which of the above was/were introduced into India by the English?

(a) 1 only (b) 1 and 2
(c) 2 and 3 (d) None

Ans: (d)

- System of land revenue, under which the land was assessed by a systematic survey and measurement of the entire cultivable land was initiated by Sher Shah Suri. During Akbar's rule, this system was more elaborated and implemented in detail across the Mughal Empire. Akbar followed the system of standardization of measurement of land; ascertaining the produce per bigha of land; and fixation of the State's share in that produce. **Hence, 1 is not correct.**
- In the First Battle of Panipat (1526), Babur used cannons against Ibrahim Lodhi's army. It was further used by Babur himself in the Battle of Khanwa in 1528 against the army of Rana Sanga. **Hence, 2 is not correct.**
- Chillies are believed to be of Mexican origin and dates back to 3500 BC. It was introduced to the rest of the world by Christopher Columbus who discovered America in 1493. It became popular in Portugal. In 1498, Vasco-da-Gama reached Indian shores and introduced chillies in India. Tobacco is a plant that grows natively in North and South America. **Hence, 3 is not correct.**

Therefore, option (d) is the correct answer.

5. With reference to Ryotwari Settlement, consider the following statements: **(2012)**

1. The rent was paid directly by the peasants to the Government.
2. The Government gave Pattas to the Ryots.
3. The lands were surveyed and assessed before being taxed.

Which of the statements given above is/are correct?

(a) 1 only (b) 1 and 2 only
(c) 1, 2 and 3 (d) None

Ans: (c)

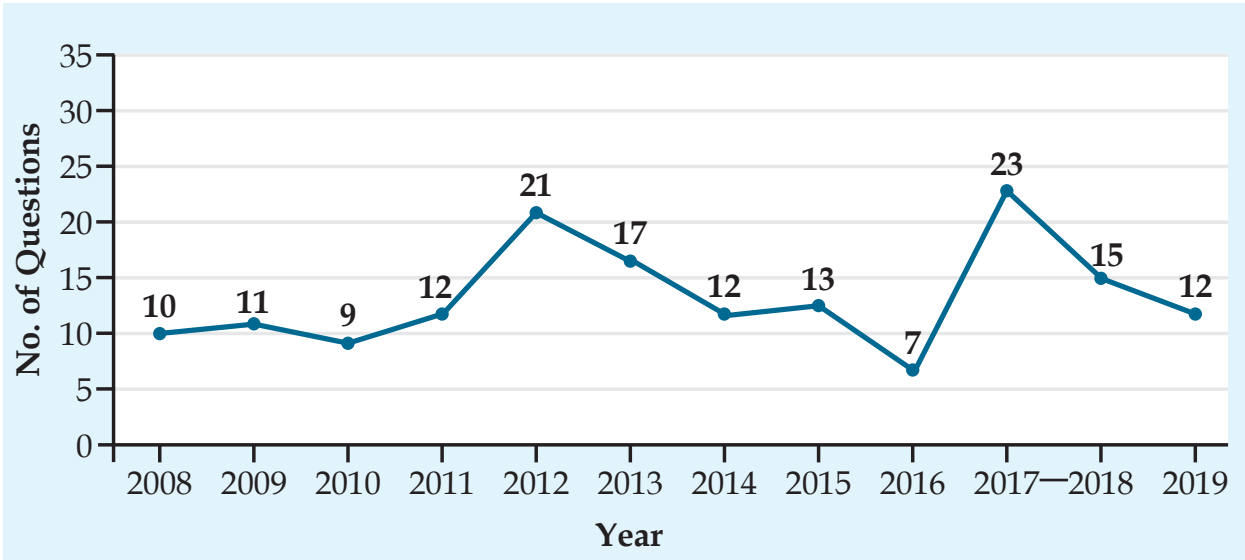
- Under the Ryotwari System, every holder of land (peasant) was recognised as its proprietor, and paid the land revenue directly to the Government. **Hence, statement 1 is correct.**
- The principle was the direct collection of the land revenue from each individual cultivator by government agents. For this purpose, all holdings were measured and assessed according to crop potential and actual cultivation.
- Pattas were assigned to the ryots on which they cultivated and paid rent for the same. **Hence, statement 2 is correct.**
- The advantages of this system were the elimination of middlemen, who often oppressed villagers, and an assessment of the tax on land actually cultivated and not merely occupied. **Hence, statement 3 is correct.**
- The system was introduced mainly in Madras, Bombay, parts of Assam and Coorgh provinces. The system was devised by Capt. Alexander Read and Sir Thomas Munro.

Therefore, option (c) is the correct answer.

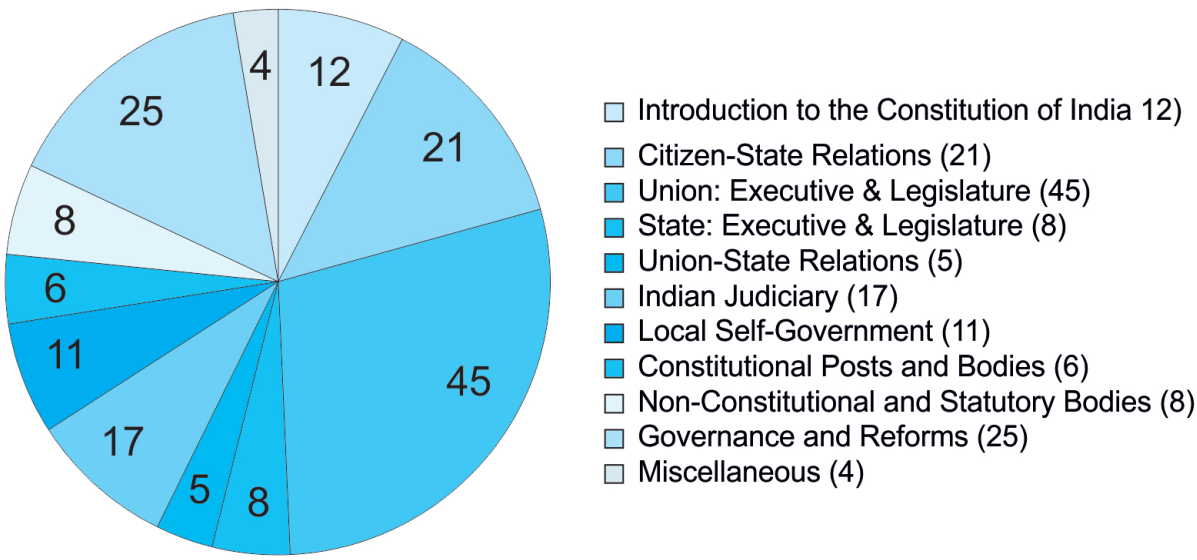
6. The tendency for increased litigation was visible after the introduction of the land settlement system of Lord Cornwallis in 1793. The reason for this is normally traced to which of the following provisions? **(2011)**

(a) Making Zamindar's position stronger *vis-a-vis* the ryot

POLITY & GOVERNANCE



Year-wise Trend of Questions



Topic-wise Distribution of Questions (2008-2019)

5 POLITY & GOVERNANCE

INTRODUCTION TO THE CONSTITUTION OF INDIA

1. Which Article of the Constitution of India safeguards one's right to marry the person of one's choice? **(2019)**

(a) Article 19
(b) Article 21
(c) Article 25
(d) Article 29

Ans: (b)

- The right to marry is a component of the right to life under Article 21 of the Constitution of India which states that "No person shall be deprived of his life and personal liberty except according to the procedure established by law".
- In Lata Singh v. State of Uttar Pradesh 2006, the Supreme Court viewed the right to marry as a component of the right to life under Article 21 of Indian Constitution.

Therefore, option (b) is the correct answer.

2. Which of the following are regarded as the main features of the "Rule of Law"? **(2018)**

1. Limitation of powers
2. Equality before law
3. People's responsibility to the Government
4. Liberty and civil rights

Select the correct answer using the code given below:

(a) 1 and 3 only (b) 2 and 4 only
(c) 1, 2 and 4 only (d) 1, 2, 3 and 4

Ans: (c)

- The 'Rule of Law' may be defined as a principle of governance in which all persons, institutions and entities, public and private, including the State itself, are accountable to laws that are publicly promulgated, equally enforced and independently adjudicated, and which are consistent with human rights norms and standards.
- It requires, as well, measures to ensure adherence to the principles of supremacy of law, equality before the law, accountability to the law, fairness in the application of the law, separation of powers, participation in decision-making, legal certainty, avoidance of arbitrariness and procedural and legal transparency.
- Key tenets of Rule of Law:
  - Equality before law; **Hence, 2 is correct.**
  - Equal protection of law;
  - Existence and preservation of liberty and civil rights; **Hence, 4 is correct.**
  - Limitation of powers of executive and legislature; **Hence, 1 is correct.**
  - Responsibility of government towards masses.

Therefore, option (c) is the correct answer.

3. Which one of the following reflects the most appropriate relationship between law and liberty? **(2018)**

(a) If there are more laws, there is less liberty.
(b) If there are no laws, there is no liberty.
(c) If there is liberty, laws have to be made by the people.
(d) If laws are changed too often, liberty is in danger.

Ans: (b)

- Liberty means the individual can act as he pleases without being under any type of arbitrary or illegal restraint or control.
- Liberty does not mean the complete absence of all laws. Liberty exists only in an ordered state. The state frames law and the sovereign state operates through these laws.
- Therefore, the existence of law is essential for the existence of liberty. It is the law that protects liberty.

Therefore, option (b) is the correct answer.

4. Out of the following statements, choose the one that brings out the principle underlying the Cabinet form of Government: (2017)
   (a) An arrangement for minimizing the criticism against the Government whose responsibilities are complex and hard to carry out to the satisfaction of all.
   (b) A mechanism for speeding up the activities of the Government whose responsibilities are increasing day by day.
   (c) A mechanism of parliamentary democracy for ensuring collective responsibility of the Government to the people.
   (d) A device for strengthening the hands of the head of the Government whose hold over the people is in a state of decline.

Ans: (c)

- Cabinet is a small body within the council consisting of Prime Minister as its head and some 15 to 20 most important ministers. It is the highest decision making body formally.
- The fundamental principle underlying the working of the cabinet form of government is the principle of collective responsibility.
- According to Article 75, the Council of Ministers (government) is collectively responsible to the Lok Sabha.
- This implies that all the ministers own joint responsibility to the Lok Sabha (to the people) for all their acts of omission and commission. When the Lok Sabha passes a no-confidence motion against the Council of Ministers, all the ministers have to resign, including those ministers who are from the Rajya Sabha.

Therefore, option (c) is the correct answer.

5. Which one of the following is ***not*** a feature of Indian federalism? (2017)
   (a) There is an independent judiciary in India.
   (b) Powers have been clearly divided between the Centre and the States.
   (c) The federating units have been given unequal representation in the Rajya Sabha.
   (d) It is the result of an agreement among the federating units.

Ans: (d)

- According to Article 1 of the Indian Constitution, India is a Union of States.
- Dr. Ambedkar, the Chairman of the Drafting Committee, eulogized the term "Union of the States" on the plea that it indicated two important facts –(a) Federalism in India had not been the result of an agreement among the units, and (b) The constituent units of the Indian Federation had no right to secede from it.
- The features of Indian federalism are as follows:
  - **Dual Polity:** The Constitution establishes a dual polity at the Centre and the States. Each is endowed with sovereign powers to be exercised in the field assigned to them respectively by the Constitution.
  - **Written Constitution:** The Constitution of India is a written document and is also the lengthiest Constitution of the world.
  - **Division of Powers:** The Constitution has divided the powers between the Centre and the States by providing the Union List, State List and Concurrent List in the Seventh Schedule. The residuary subjects are given to the Centre.
  - **Supremacy of the Constitution:** The Constitution is the supreme law of the land. The laws enacted by the Centre and the States must conform to its provisions.
  - **Independent Judiciary:** The Constitution establishes an independent judiciary headed by the Supreme Court.
  - **Bicameralism:** The Constitution provides for a bicameral legislature consisting of an Upper House (Rajya Sabha) and a Lower House (Lok Sabha). The Rajya Sabha represents the states of Indian Federation and maintains the federal equilibrium by protecting the interests of the States against the undue interference of the Centre.

Therefore, option (d) is the correct answer.

6. The mind of the makers of the Constitution of India is reflected in which of the following? (2017)
   (a) The Preamble
   (b) The Fundamental Rights
   (c) The Directive Principles of State Policy
   (d) The Fundamental Duties

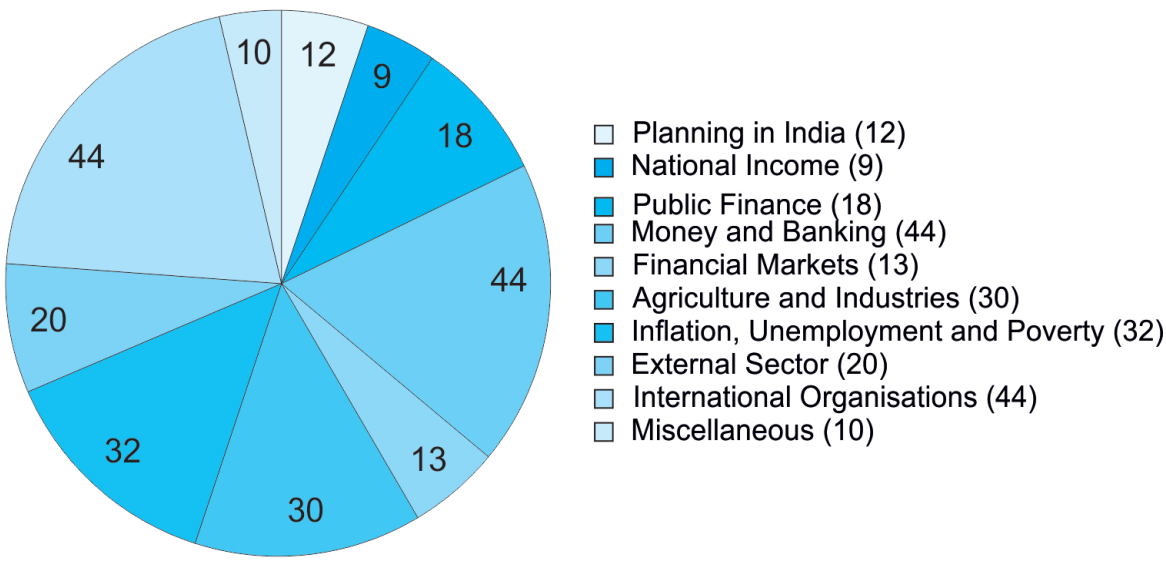
Ans: (a)

- In Berubari Union and Exchange of Enclaves case, the Supreme Court of India held that the Preamble serves as the key to open the mind of the makers of the Constitution, which may show the general purposes for which they made several provisions in the Constitution.
- The Preamble sets the objectives, guiding principles and philosophy of the Indian Constitution.

Therefore, option (a) is the correct answer.

ECONOMY

Year-wise Trend of Questions



Topic-wise Distribution of Questions (2008-2019)

6 ECONOMY

PLANNING IN INDIA

1. With reference to India's Five-Year Plans, which of the following statements is/are correct? **(2019)**

1. From the Second Five-Year Plan, there was a determined thrust towards substitution of basic and capital good industries.
2. The Fourth Five-Year Plan adopted the objective of correcting the earlier trend of increased concentration of wealth and economic power.
3. In the Fifth Five-Year Plan, for the first time, the financial sector was included as an integral part of the Plan.

Select the correct answer using the code given below:

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

Ans: (a)

- India adopted the strategy of Import Substitution Industrialization (ISI) in the fifties. The chief objective was to build a self-reliant economy. From the Second Five Year Plan, there was determined thrust towards substitution of basic and capital goods industries. **Hence, statement 1 is correct**.
- The Fourth Five Year Plan emphasised on reduction of concentration of incomes, wealth and economic power to achieve social equality and justice. **Hence, statement 2 is correct**.
- The Fifth Five Year Plan was aimed at the removal of poverty and achievement of self-reliance. The Eighth Plan focussed on financial sector reforms. **Hence, statement 3 is not correct**.
- **Therefore, option (a) is the correct answer**.

2. Which of the following has/have occurred in India after its liberalization of economic policies in 1991? **(2017)**

1. Share of agriculture in GDP increased enormously.
2. Share of India's exports in world trade increased.
3. FDI inflows increased.
4. India's foreign exchange reserves increased enormously.

Select the correct answer using the codes given below:

(a) 1 and 4 only (b) 2, 3 and 4 only
(c) 2 and 3 only (d) 1, 2, 3 and 4

Ans: (b)

- Economic reforms in India refer to the neo-liberal policies introduced by the government in 1991 and in the later years. The central point of the reforms was the liberalization of the economy, simplifying regulations and giving more role to the private sector. The New Industrial Policy of 1991 is the heart of the new economic reforms.
- Following are the main features of New Economic Reforms:
  - De-reservation of the industrial sector.
  - Industrial de-licensing policy.
  - Opening up of the economy to foreign competition – the economic reforms introduced extensive liberalization of foreign trade and foreign investment. The import substitution and import restriction policies were abandoned and instead import liberalization and export promotion policies were introduced. This increased India's share in export. **Hence, statement 2 is correct.**
  - Liberalization of trade and investment
- However, there was a gradual decline in the agriculture sector's contribution to the Indian economy. Presently agriculture contributes about 17% to the GDP, down from 29% in 1991. **Hence, statement 1 is not correct.**
- Foreign investment was almost negligible before 1991. On the investment front, the economic reforms mark the era of capital mobility in the country. Foreign capital in the form of FDI (Foreign Direct Investment) and FPI (Foreign Portfolio Investment) entered into the country. **Hence, statement 3 is correct.**

- India's poor state of FOREX reserves was also one of the factors that forced the government to bring in economic reforms of 1991. Presently, FOREX reserve of India is on a record high comparatively to that in 1991. **Hence, statement 4 is correct.**

Therefore, option (b) is the correct answer.

3. With reference to the Fourteenth Finance Commission, which of the following statements is/are correct? **(2015)**

1. It has increased the share of States in the central divisible pool from 32 percent to 42 percent.
2. It has made recommendations concerning sector-specific grants.

Select the correct answer using the code given below:

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

Ans: (a)

- Article 280 of the Indian Constitution entitles the President to Constitute a 5 members Finance Commission after expiration of every five years.
- The Commission makes recommendations to the President about the distribution of the net proceeds of taxes between the Union and the states.
- The Fourteenth Finance Commission was constituted for the same purpose. Headed by Y.V. Reddy, former RBI Governor, it submitted its recommendation to the President, which were:
  - Increase the states share from 32% to 42%, **Hence, statement 1 is correct.**
  - Tax devolution should be the primary route for transfer of resources to the States,
- In recommending a horizontal distribution, the Commission employed following parameters:

Parameters	Weightage
Fiscal Capacity/Income Distance	50.0%
Population (1971)	17.5%
Population (2011)	10.0%
Area	15.0%
Forest Cover	7.5%

- The Commission did not recommend any sector specific grants. **Hence, statement 2 is not correct.**

Therefore, option (a) is the correct answer.

4. The main objective of the 12th Five-Year Plan is **(2014)**

(a) inclusive growth and poverty reduction
(b) inclusive and sustainable growth
(c) sustainable and inclusive growth to reduce unemployment
(d) faster, sustainable and more inclusive growth

Ans: (d)

- The 12th Five Year Plan (2012-17) document sought to achieve annual average economic growth rate of 8.2%, down from 9% envisaged earlier, in view of fragile global recovery.
- The aim of the Plan was "faster, sustainable and more inclusive growth".

Therefore, option (d) is the correct answer.

5. To obtain full benefits of demographic dividend, what should India do? **(2013)**

(a) Promoting skill development
(b) Introducing more social security schemes
(c) Reducing infant mortality rate
(d) Privatization of higher education

Ans: (a)

- Demographic dividend refers to the growth in an economy due to a rising share of working age population.
- According to economists, the working population in India is set to rise considerably in the coming decades.
- In India, there is a significant number of working age adults and to obtain the full benefits of the demographic dividend, the government should focus on skill development and other vocational training as the skilled working population will be easily inducted into work force and be the base of economic development.

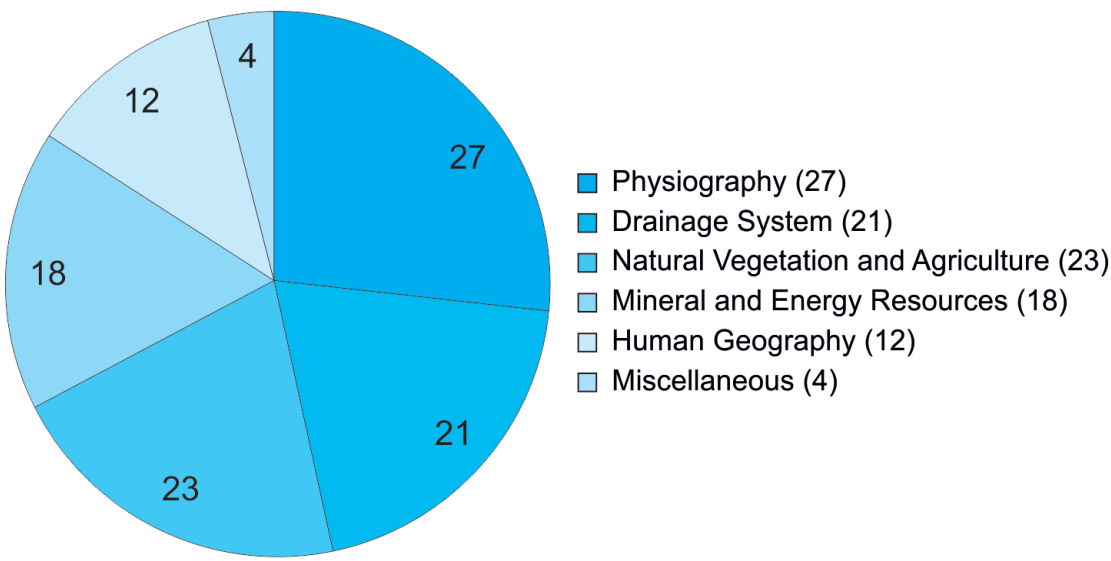
Therefore, option (a) is the correct answer.

6. Which of the following is/are among the noticeable features of the recommendations of the Thirteenth Finance Commission? **(2012)**

1. A design for the Goods and Services Tax, and a compensation package linked to adherence to the proposed design.
2. A design for the creation of lakhs of jobs in the next ten years in consonance with India's demographic dividend
3. Devolution of a specified share of central taxes to local bodies as grants

INDIAN GEOGRAPHY

Year-wise Trend of Questions



Topic-wise Distribution of Questions (2008-2019)

7 INDIAN GEOGRAPHY

PHYSIOGRAPHY

1. Among the following cities, which one lies on a longitude closest to that of Delhi? **(2018)**

(a) Bengaluru (b) Hyderabad
(c) Nagpur (d) Pune

Ans: (a)

- The Longitudinal Position of the given cities are:
  - Bengaluru (77.5946° E)
  - New Delhi (77.2090° E)
  - Hyderabad (78.4867° E)
  - Nashik (73.7898° E)
  - Pune (73.8567° E)
- Bengaluru lies on the closest longitude to that of Delhi.

Therefore, option (a) is the correct answer.

2. Consider the following statements: **(2018)**

1. The Barren Island volcano is an active volcano located in the Indian territory.
2. Barren Island lies about 140 km east of Great Nicobar.
3. The last time the Barren Island volcano erupted was in 1991 and it has remained inactive since then.

Which of the statements given above is/are correct?

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

Ans: (a)

- Barren Island is India's only active volcano which is located in the Andaman and Nicobar Islands. **Hence, statement 1 is correct.**
- It is located at about 140 km from Port Blair, southern part of Andaman Island in Andaman Sea. The distance between Barren Island to Great Nicobar is more than the given distance. **Hence, statement 2 is not correct.**
- First recorded eruption of the volcano dates back to 1787. In the past 100 years, it has erupted at least five times. Then for the next 100 years, it remained silent. It re-erupted massively in 1991. Since then, the eruption has been recorded every two-three years; the latest in the series was February 2016. **Hence, statement 3 is not correct.**

Therefore, option (a) is the correct answer.

3. Consider the following statements: **(2017)**

1. In India, the Himalayas are spread over five States only.
2. Western Ghats are spread over five States only.
3. Pulicat Lake is spread over two States only.

Which of the statements given above is/are correct?

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

Ans: (b)

- The Indian Himalayan Region is spread over 12 states, namely, Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh, Meghalaya, Nagaland, Manipur, Mizoram, Tripura, Assam and West Bengal. **Hence, statement 1 is not correct**.
- Western Ghats range over six states, Kerala, Tamil Nadu, Karnataka, Goa, Maharashtra and Gujarat. **Hence, statement 2 is not correct**.
- Pulicat Lake is the second largest brackish waterbody after Chilika Lake (in Odisha) and is shared by Tamil Nadu and Andhra Pradesh. **Hence, statement 3 is correct**.

Therefore, option (b) is the correct answer.

4. If you travel by road from Kohima to Kottayam, what is the minimum number of States within India through which you can travel, including the origin and the destination? **(2017)**

(a) 6 (b) 7
(c) 8 (d) 9

Ans: (b)

- If a person travels through road from Kohima (Nagaland) to Kottayam (Kerala), he shall pass through minimum 7 states and could choose between two alternate routes:

- **Route 1:** Nagaland, Assam, West Bengal, Odisha, Andhra Pradesh, Tamil Nadu and Kerala.
- **Route 2:** Nagaland, Assam, West Bengal, Odisha, Telangana, Karnataka and Kerala.

Therefore, option (b) is the correct answer.

5. At one of the places in India, if you stand on the seashore and watch the sea, you will find that the sea water recedes from the shore line a few kilometres and comes back to the shore, twice a day, and you can actually walk on the sea floor when the water recedes. This unique phenomenon is seen at (2017)

(a) Bhavnagar (b) Bheemunipatnam
(c) Chandipur (d) Nagapattinam

Ans: (c)

- Chandipur is located in Balasore district in Odisha. This beach here is unique in the sense that the sea water retreats inside the sea from 1 km to 5 km every day and it again comes back to the shore slowly during the high tide. This happens twice every day.
- It is also known as Odisha's Hide and Seek Beach.

Therefore, option (c) is the correct answer.

6. From the ecological point of view, which one of the following assumes importance in being a good link between the Eastern Ghats and the Western Ghats? (2017)

(a) Sathyamangalam Tiger Reserve
(b) Nallamala Forest
(c) Nagarhole National Park
(d) Seshachalam Biosphere Reserve

Ans: (a)

- Sathyamangalam Wildlife Sanctuary and Tiger Reserve is a protected area along the Western Ghats in the Indian State of Tamil Nadu.
- Sathyamangalam forest range is a significant wildlife corridor in the Nilgiri Biosphere Reserve between the Western Ghats and the rest of the Eastern Ghats and a genetic link between the four other protected areas which it adjoins, including the Biligiriranga Swamy Temple Wildlife Sanctuary, Sigur Plateau, Mudumalai National Park and Bandipur National Park.
- First declared as a wildlife sanctuary in 2008 and enlarged in 2011, it covers a forest area of 1,411.6 sq km and is the largest wildlife sanctuary in Tamil Nadu. In 2013, it became the fourth tiger reserve as a part of Project Tiger in the State of Tamil Nadu.
- Nallamala Forest is one of the largest undisturbed stretches of forest in South India. It is located in the Nallamala Hill, which is a part of the Eastern Ghats. It is spread over 5 districts, namely Kurnool, Guntur, Kadapa, Mahabubnagar and Prakasam. The forest has a good tiger population and a part of the forest belongs to the Nagarjunsagar-Srisailam Tiger Reserve.
- Nagarhole National Park is situated in two districts of Mysore and Kodagu in the State of Karnataka. Nagarahole National Park forms a part of the Nilgiri Biosphere Reserve and together with Bandipur National Park and Mudumalai Wildlife Sanctuary to its South-East and Wayanad to the South-West, is one of the last remaining and best protected habitats for endangered species like the Elephant and the Tiger.
- Seshachalam hills are the hill ranges spread in parts of Chittoor and Kadapa districts of Andhra Pradesh and have been designated as Seshachalam Biosphere Reserve in 2010. The Biosphere Reserve has large reserves of red sandalwood.

Therefore, option (a) is the correct answer.

7. Which one of the following National Parks has a climate that varies from tropical to subtropical, temperate and arctic? (2015)

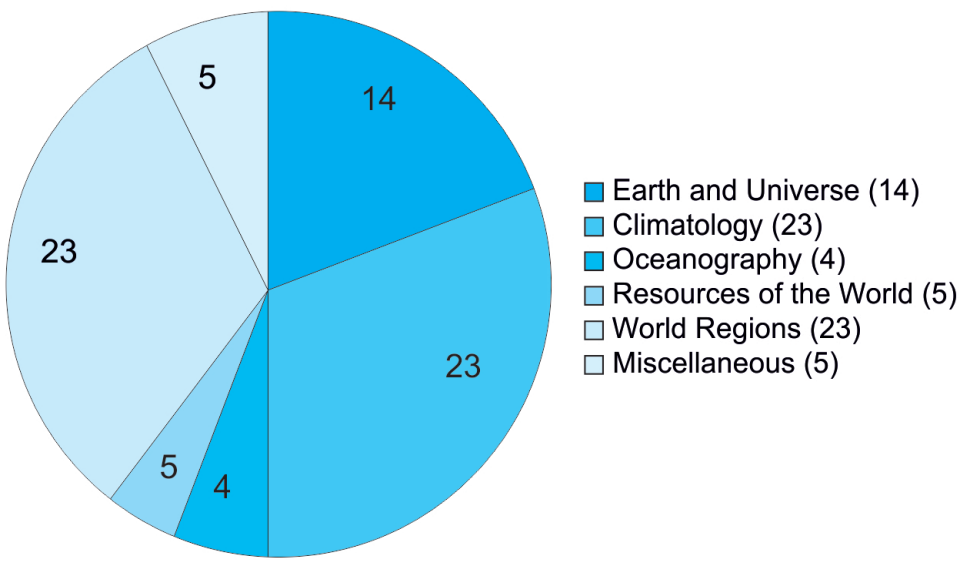
(a) Khangchendzonga National Park
(b) Nandadevi National Park
(c) Neora Valley National Park
(d) Namdapha National Park

Ans: (d)

- Namdapha National Park, is located between the Dapha bum range of the Mishmi Hills and the Patkai range, with a wide elevation range between 200-4,571 m. It is crossed from East to West by the Noa Dihing River and is the 3rd largest national park in India in terms of area.
- Owing to its wide altitudinal variation, Tropical moist forests, Montane forests, Temperate forests and at the higher elevations, Alpine meadows and perennial snow can be found.
- It is located in the Eastern Himalayan Sub-region, along the turbulent Noa-Dihing River at the international border between India and Myanmar
- Namdapha National Park is the only park in India to house four big cat species – leopard, tiger, clouded leopard and snow leopard.
- Khangchendzonga National Park in Sikkim has been declared as a World Heritage Site by UNESCO in 2016. It was declared a National Park in 1977. The park gets its name from the third highest mountain in the world, Kanchenjunga or Khangchendzonga. The park is home

WORLD GEOGRAPHY

Year-wise Trend of Questions



Topic-wise Distribution of Questions (2008-2019)

8 WORLD GEOGRAPHY

EARTH AND UNIVERSE

1. On 21st June, the Sun **(2019)**

(a) does not set below the horizon at the Arctic Circle

(b) does not set below the horizon at Antarctic Circle

(c) shines vertically overhead at noon on the Equator

(d) shines vertically overhead at the Tropic of Capricorn

Ans: (a)

- During 'Summer Solstice', on 21st June, the Northern Hemisphere witnesses its longest day of the year, while the Southern Hemisphere sees its shortest day.
- During this time, the Earth's North Pole is at its maximum tilt towards the Sun and the Sun appears directly overhead at 23.5° north latitude, i.e. along the Tropic of Cancer.
- As the Arctic Circle falls in the Northern Hemisphere, the Sun does not set below the horizon during Summer Solstice, because here the sunrise and sunset start to converge in the northern sky. In contrast, the same event happens in the Antarctic Circle during Winter Solstice, 22nd December.

Therefore, option (a) is the correct answer.

2. Consider the following statements: **(2018)**

1. The Earth's magnetic field has reversed every few hundred thousand years.
2. When the Earth was created more than 4000 million years ago, there was 54% oxygen and no carbon dioxide.
3. When living organisms originated, they modified the early atmosphere of the Earth.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

Ans: (c)

- Earth's Magnetic Field is a magnetic dipole, tilted 11° from the Earth's axis of rotation. The magnetic North Pole is a point on Ellesmere Island in North Canada, while the magnetic South Pole is off the coast of Antarctica between Adelie Land and Wilkes Land.
- Magnetic fingerprints locked in ancient rocks show that over last 20 million years, magnetic North and South have flipped roughly every 200,000 to 300,000 years. The last of these major reversals occurred about 780,000 years ago, although the Poles do wander around in between these larger flips. **Hence, statement 1 is correct.**
- When the Earth formed 4.6 billion years ago from a hot mix of gases and solids, it had almost no atmosphere. The surface was molten. As the Earth cooled, an atmosphere formed mainly from gases spewed from volcanoes. It included Hydrogen Sulphide, Methane, and 10 to 200 times as much Carbon Dioxide as today's atmosphere. **Hence, statement 2 is not correct.**
- Around 2.5 million years ago, the amount of Oxygen available in the atmosphere started to rise due to the evolution of photosynthetic organisms that produced oxygen. These organisms were oceanic cyano-bacteria. Over time, aerobic organisms evolved and consumed some of the oxygen produced. **Hence, statement 3 is correct.**

Therefore, option (c) is the correct answer.

3. The term 'Goldilocks Zone' is often seen in the news in the context of **(2015)**

(a) the limits of habitable zone above the surface of the Earth

(b) regions inside the Earth where shale gas is available

(c) search for the Earth-like planets in outer space

(d) search for meteorites containing precious metals

Ans: (c)

- The 'Goldilocks Zone' refers to the habitable zone around a star where the temperature is just right – not too hot and not too cold – for liquid water to exist on a planet.
- Since liquid water is essential for life as it has potential to accommodate biotic organism, thereby, it is called 'habitable zone'.

Therefore, option (c) is the correct answer.

4. Which of the following phenomena might have influenced the evolution of organisms? **(2014)**

1. Continental drift
2. Glacial cycles

Select the correct answer using the code given below:

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

Ans: (c)

- Continental drift explains how the continents shift position on the Earth's surface due to movement of lithospheric plates.
- In glacial cycle, during a glacial period, glacial advancement occurs and in an interglacial period (the warmer period between the ice ages) glaciers retreat. Both the processes of continental drift and glacial cycles have influenced the evolution of organisms.

Therefore, option (c) is the correct answer.

5. Consider the following: **(2013)**

1. Electromagnetic radiation
2. Geothermal energy
3. Gravitational force
4. Plate movements
5. Rotation of the earth
6. Revolution of the earth

Which of the above are responsible for bringing dynamic changes on the surface of the earth?

(a) 1, 2, 3 and 4 only
(b) 1, 3, 5 and 6 only
(c) 2, 4, 5 and 6 only
(d) 1, 2, 3, 4, 5 and 6

Ans: (d)

- The Earth's surface is dynamic. The Earth's surface is being continuously subjected to by external forces (exogenic forces) originating above the earth's surface, mainly induced by the energy of the Sun and by internal forces (endogenic forces) from within the earth.
- **Endogenic Processes**
  - The energy emanating from within the earth is the main force behind endogenic geomorphic processes.
  - This energy is mostly generated by radioactivity, release of electromagnetic energy, rotational and tidal friction and primordial heat from the origin of the Earth.
  - This energy is due to geothermal gradients and heat flow from within the earth.
  - Endogenic process has induced volcanism and associated geothermal phenomena like geysers, hot water springs, etc.; earthquakes; plate movements resulting in the creation of different landforms (mountains, hills, plateaus, etc.) and water bodies (sea, ocean, lake, etc.).
- **Exogenic Processes**
  - The exogenic processes derive their energy from atmosphere determined by the ultimate energy from the Sun, e.g., weathering and erosion.
  - Temperature and precipitation are the two important climatic elements that control various processes.
- Seasonal and diurnal variation on Earth is due to revolution and rotation of Earth respectively.

Therefore, option (d) is the correct answer.

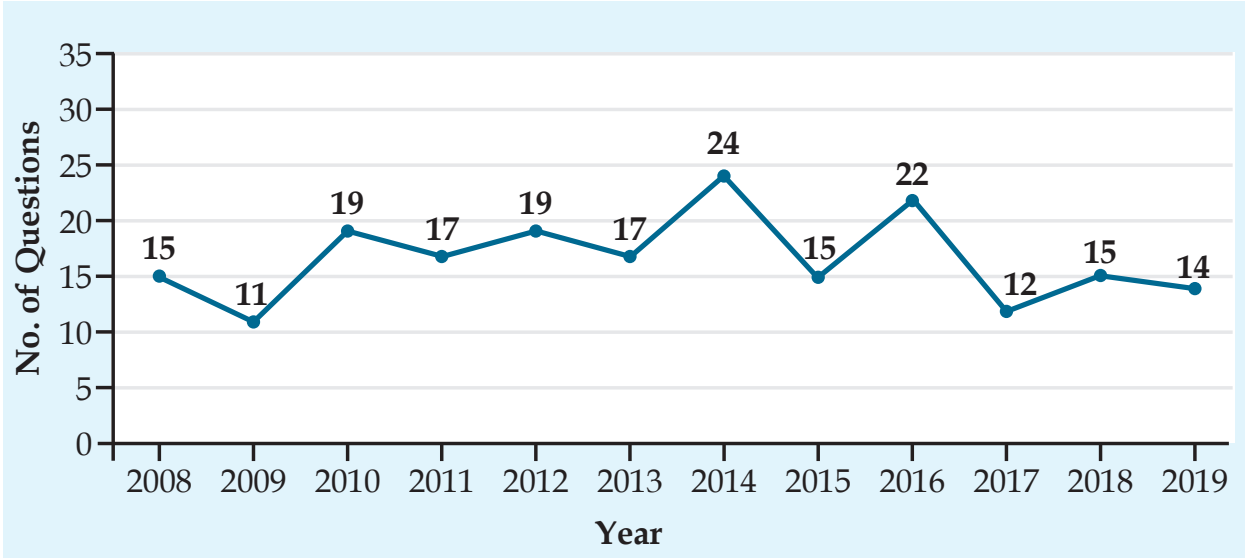
6. On the planet earth, most of the freshwater exists as ice caps and glaciers. Out of the remaining freshwater, the largest proportion **(2013)**

(a) is found in atmosphere as moisture and clouds
(b) is found in freshwater lakes and rivers
(c) exists as groundwater
(d) exists as soil moisture

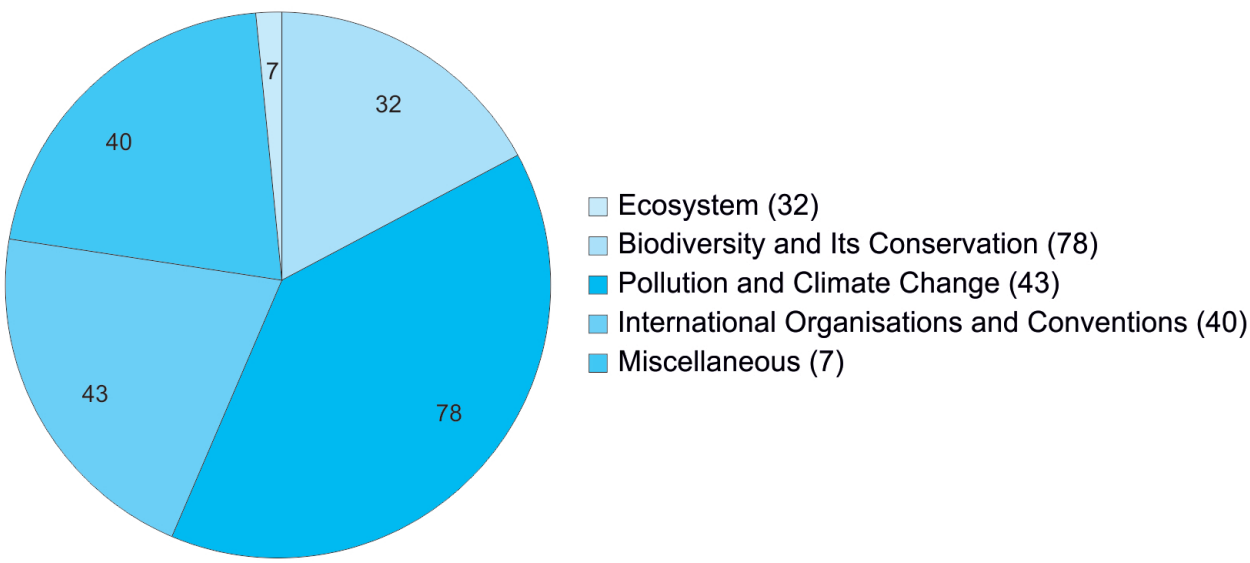
Ans: (c)

- The water cycle describes how water evaporates from the Earth's surface, rises into the atmosphere, cools, condenses to form clouds, and falls again to the surface as precipitation.
- Of all the water that exists on our planet, around 97% is saltwater and around less than 3% is freshwater.
- Most of Earth's freshwater is frozen in glaciers, ice caps, and most of the rest is deep underground in aquifers.

ENVIRONMENT & ECOLOGY



Year-wise Trend of Questions



Topic-wise Distribution of Questions (2008-2019)

9 ENVIRONMENT & ECOLOGY

ECOSYSTEM

1. Which of the following leaf modifications occur(s) in the desert areas to inhibit water loss? **(2018)**

1. Hard and waxy leaves
2. Tiny leaves
3. Thorns instead of leaves

Select the correct answer using the code given below:

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

Ans: (d)

- Most deserts have a considerable amount of specialized vegetation, as well as specialized vertebrate and invertebrate animals. Soils often have abundant nutrients because they need only water to become very productive and have little or no organic matter. Disturbances are common in the form of occasional fires or cold weather, and sudden, infrequent, but intense rains that cause flooding.
- Temperatures exhibit daily extremes because the atmosphere contains little humidity to block the Sun's rays. Desert surfaces receive a little more than twice the solar radiation received by humid regions and lose almost twice as much heat at night. Mean annual temperatures range from 20-25°C. The extreme maximum temperature ranges from 43.5-49°C. Minimum temperature sometimes drop to –18°C.
- Rainfall is usually very low and/or concentrated in short bursts between long rainless periods. Evaporation rates regularly exceed rainfall rates. Sometimes rain starts falling and evaporates before reaching the ground.
- Soils are coarse-textured, shallow, rocky or gravely with good drainage and have no subsurface water. They are coarse because there is less chemical weathering. The finer dust and sand particles are blown elsewhere, leaving heavier pieces behind.
- The plants found in the desert are xerophytic plants which have special characteristics to withstand very high rate of evaporation. They have long roots, thick barks, waxy leaves, thorns and little leaves. The leaves are leathery and have a waxy substance on top to prevent water loss through the epidermis. Many xerophytic plants have small leaves and thorns. The tiny leaves, which are often circular in cross section, reduce the surface area and hence the evaporation from the surface. Spines protect the plant from animals, provide shade from the Sun and also collect moisture. **Hence, 1, 2 and 3 are correct.**

Therefore, option (d) is the correct answer.

2. Which of the following statements best describes "carbon fertilization"? **(2018)**

(a) Increased plant growth due to increased concentration of carbon dioxide in the atmosphere.
(b) Increased temperature of Earth due to increased concentration of carbon dioxide in the atmosphere.
(c) Increased acidity of oceans as a result of increased concentration of carbon dioxide in the atmosphere.
(d) Adaptation of all living beings on Earth to the climate change brought about by the increased concentration of carbon dioxide in the atmosphere.

Ans: (a)

- Carbon Fertilization can be defined as increased rate of photosynthesis due to the large amount of carbon dioxide in the atmosphere that has resulted from rising anthropogenic emissions.
- Increased rate of photosynthesis results in increased plant growth.

Therefore, option (a) is the correct answer.

3. Consider the following: **(2018)**

1. Birds
2. Dust blowing
3. Rain
4. Wind blowing

Which of the above spread plant diseases?

(a) 1 and 3 only (b) 3 and 4 only
(c) 1, 2 and 4 only (d) 1, 2, 3 and 4

Ans: (d)

- Extensive and severe epidemics of plant diseases are mostly the results of wind blowing including dust blowing which cause transmission of the pathogens. **Hence, 2 and 4 are correct.**
- Splashing rain drops mostly transmit the foliar diseases from leaf to leaf, from shoot to shoot and even from plant to plant in case of closely spaced crops. **Hence, 3 is correct.**
- Birds play a minor role in disease transmission in plants. It is mainly by way of dispersal of seeds of higher flowering plant parasite, etc. **Hence, 1 is correct.**

Therefore, option (d) is the correct answer.

4. The FAO accords the status of 'Globally Important Agricultural Heritage System (GIAHS)' to traditional agricultural systems. What is the overall goal of this initiative? **(2016)**

1. To provide modern technology, training in modern farming methods and financial support to local communities of identified GIAHS so as to greatly enhance their agricultural productivity.
2. To identify and safeguard eco-friendly traditional farm practices and their associated landscapes, agricultural biodiversity and knowledge systems of the local communities.
3. To provide Geographical Indication status to all the varieties of agricultural produce in such identified GIAHS.

Select the correct answer using the code given below:

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

Ans: (b)

- Globally Important Agricultural Heritage System (GIAHS) is an initiative of Food and Agriculture Organisation (FAO). Its overall goal is to identify and safeguard Globally Important Agricultural Heritage Systems and their associated landscapes, agricultural biodiversity and knowledge systems through catalysing and establishing a long-term programme to support such systems and enhance global, national and local benefits derived through their dynamic conservation, sustainable management and enhanced viability. **Hence, 2 is correct.**
- **Objective of GIAHS**
  - To leverage global and national recognition of the importance of agricultural heritage systems and institutional support for their safeguard.
  - Capacity building of local farming communities and local and national institutions to conserve and manage GIAHS, generate income and add economic value to goods and services of such systems in a sustainable fashion.
  - To promote enabling regulatory policies and incentive environments to support the conservation, evolutionary adaptation and viability of GIAHS.
  - It does not aim to provide modern technologies and Geographical Indication status to identified GIAHS. **Hence, 1 and 3 are not correct.**

Therefore, option (b) is the correct answer.

5. Why does the Government of India promote the use of 'Neem-coated Urea' in agriculture? **(2016)**

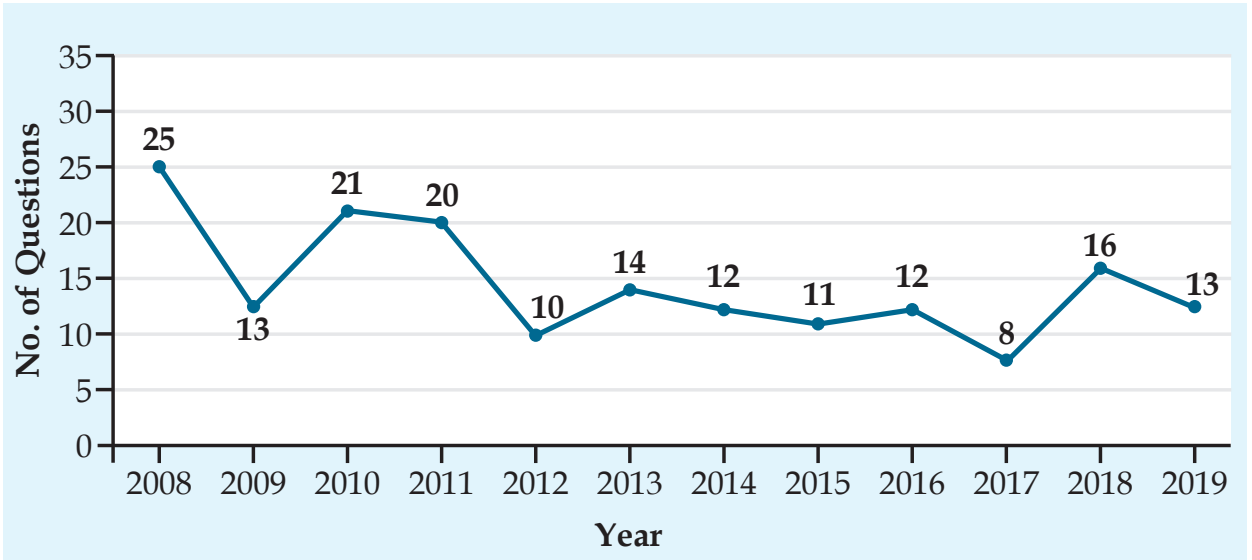
(a) Release of Neem oil in the soil increases nitrogen fixation by the soil microorganisms.
(b) Neem coating slows down the rate of dissolution of urea in the soil.
(c) Nitrous oxide, which is a greenhouse gas, is not at all released into atmosphere by crop fields.
(d) It is a combination of a weedicide and a fertilizer for particular crops.

Ans: (b)

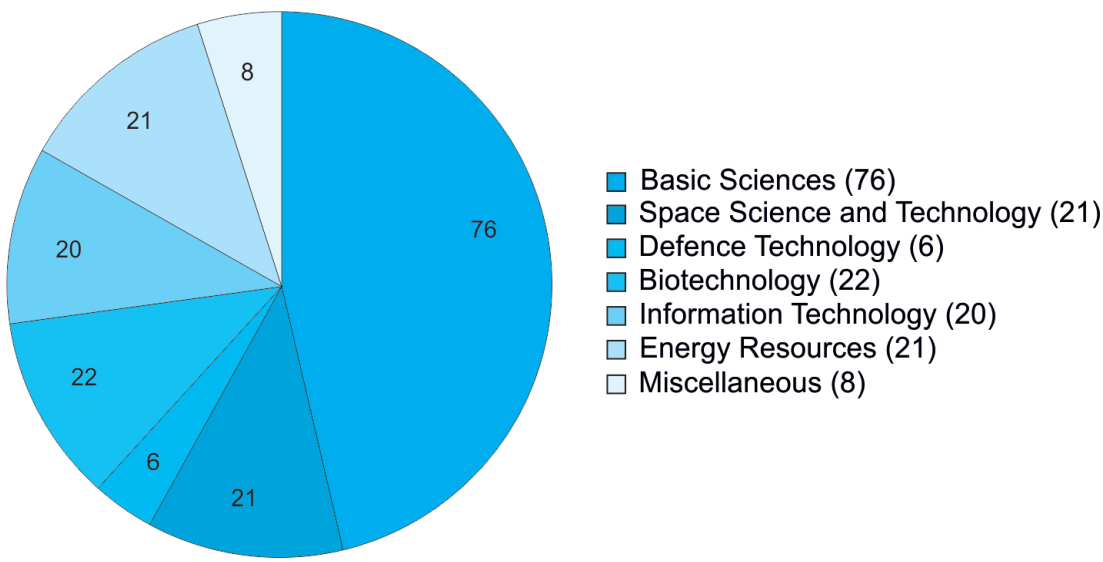
- **Ordinary Urea:** It is a fertiliser used to provide Nitrogen to the soil, which is necessary for the development of plants. Only 30-40% of Nitrogen present in the urea is utilised by crops. The rest gets degraded. Ordinary urea gets converted to Ammonium Carbamate. Some of this gets converted to Ammonia Gas in a process called ammonia volatilisation, while the rest of the Ammonium Carbamate undergoes a chemical transformation and Nitrates are formed. Some of these are absorbed by the plants. The rest is either leached into the underground water or are denitrified to gaseous Nitrogen and Nitrous Oxide under anaerobic conditions (absence of Oxygen).
- **Neem Coated Urea:** Neem has properties that check nitrogen loss at each stage. It slows down the process of nitrate formation and hence excess nitrate is not available for denitrification. Thus, it helps in countering the degradation of soil and underground water and also any subsequent air pollution by slowing down the rate of dissolution of urea in the soil.

Therefore, option (b) is the correct answer.

SCIENCE & TECHNOLOGY



Year-wise Trend of Questions



Topic-wise Distribution of Questions (2008-2019)

10 SCIENCE & TECHNOLOGY

BASIC SCIENCES

1. Which one of the following statements is ***not*** correct? **(2019)**

(a) Hepatitis B virus is transmitted much like HIV.

(b) Hepatitis B unlike Hepatitis C, does not have a vaccine.

(c) Globally, the number of people infected with Hepatitis B and C viruses arc several times more than those infected with HIV.

(d) Some of those infected with Hepatitis B and C viruses do not show the symptoms for many years.

Ans: (b)

- Hepatitis B is a viral infection that attacks the liver and can cause both acute and chronic disease. The virus is transmitted through contact with the blood or other body fluids of an infected person, much like HIV transmission.
- A vaccine against Hepatitis B has been available since 1982. The vaccine is 95% effective in preventing infection and the development of chronic disease and liver cancer, due to which it came to be known as first 'anti-cancer' vaccine.
- According to the WHO data, an estimated 257 million people are living with Hepatitis B, whereas an estimated 71 million people have chronic Hepatitis C infection. There were approximately 36.9 million people living with HIV at the end of 2017 with 1.8 million people becoming newly infected in 2017 globally.
- Hepatitis C is a liver disease caused by the Hepatitis C virus, ranging in severity from a mild illness lasting a few weeks to a serious, lifelong illness. The Hepatitis C virus is a blood borne virus and the most common modes of infection are through exposure to small quantities of blood. This may happen through drug use, unsafe injection practices, unsafe health care, and the transfusion of unscreened blood and blood products. Sometimes Hepatitis B and C viruses do not show the symptoms for many years.

Therefore, option (b) is the correct answer.

2. Consider the following phenomena: **(2018)**

1. Light is affected by gravity.
2. The Universe is constantly expanding.
3. Matter warps its surrounding space-time.

Which of the above is/are the prediction/ predictions of Albert Einstein's General Theory of Relativity, often discussed in media?

(a) 1 and 2 only (b) 3 only

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

Ans: (d)

- Space-time is a mathematical model that joins space and time into a single idea called a continuum. This four-dimensional continuum is known as Minkowski Space. According to this model, Einstein held that matter warps its surrounding space-time. **Hence, 3 is correct.**
- Gravitational Lensing states that gravity bends light. When we observe distant galaxy, gravity of matter between earth and galaxy causes the light rays to bend into different paths. When the same light reaches to telescope multiple images are observed in the galaxy. **Hence, 1 is correct.**
- In 1917, Einstein applied his Theory of General Relativity and suggested a model of a homogenous, static, and spatially curved universe. The problem with the model was that, if gravitation was the only active force, then the universe would collapse – an issue which Einstein addressed by introducing the cosmological constant. By 1932, Einstein accepted and adopted a model of an expanding universe. **Hence, 2 is correct.**

Therefore, option (d) is the correct answer.

3. Consider the following pairs: **(2017)**

	Commonly used/ consumed materials		**Unwanted or controversial chemicals likely to be found in them**
1.	Lipstick	–	Lead

2. Soft drinks — Brominated vegetable oils
3. Chinese fast food — Monosodium glutamate

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

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

Ans: (d)

- Lead occurs naturally in the environment. It is a common impurity found in lipsticks, eye shadows, blushes, shampoos, compact powders and body lotions, etc. **Hence, pair 1 is correctly matched**.
- Brominated vegetable oil (BVO) is a food additive which is used to keep citrus flavouring intact in some sodas and soft drinks. BVO is banned as a food additive in Japan and Europe. **Hence, pair 2 is correctly matched**.
- Monosodium Glutamate (MSG) is commonly used in Chinese fast food. It is a glutamate, or salt of glutamic acid, which is a "non-essential" amino acid. In the West, this MSG additive has been blamed for a number of adverse reactions – headaches, sweating, flushing, numbness of the face and neck, palpitations, nausea, chest pain and sleeplessness – known collectively as "Chinese restaurant syndrome". **Hence, pair 3 is correctly matched**

Therefore, option (d) is the correct answer.

4. Organic Light Emitting Diodes (OLEDs) are used to create digital display in many devices. What are the advantages of OLED displays over Liquid Crystal displays? **(2017)**
   1. OLED displays can be fabricated on flexible plastic substrates.
   2. Roll-up displays embedded in clothing can be made using OLEDs.
   3. Transparent displays are possible using OLEDs.

   Select the correct answer using the code given below:

   (a) 1 and 3 only
   (b) 2 only
   (c) 1, 2 and 3
   (d) None of the above statements is correct

Ans: (c)

- Organic Light Emitting Diodes (OLEDs) is a flat light emitting technology, made by placing a series of organic thin films between two conductors. OLEDs are emissive displays that do not require a backlight and so are thinner and more efficient than LCD displays (which do require a white backlight). Since OLEDs do not require backlighting, hence they can be used in making transparent displays. **Hence, 3 is correct.**
- OLED displays are not just thin and efficient, they provide the best image quality ever and they can also be made transparent, flexible, foldable and even rollable and stretchable in the future.
- OLED substrates can be more plastic rather than the glass used for LEDs and LCDs, so they can be fabricated on flexible plastic substrates**. Hence, 1 is correct.**
- The manufacturing process of OLEDs is different to those of LCDs. OLEDs can be printed onto almost any substrate with inkjet printer technology. So, using OLEDs displays embedded in clothes or roll-up displays are possible. **Hence, 2 is correct.**

Therefore, option (c) is the correct answer.

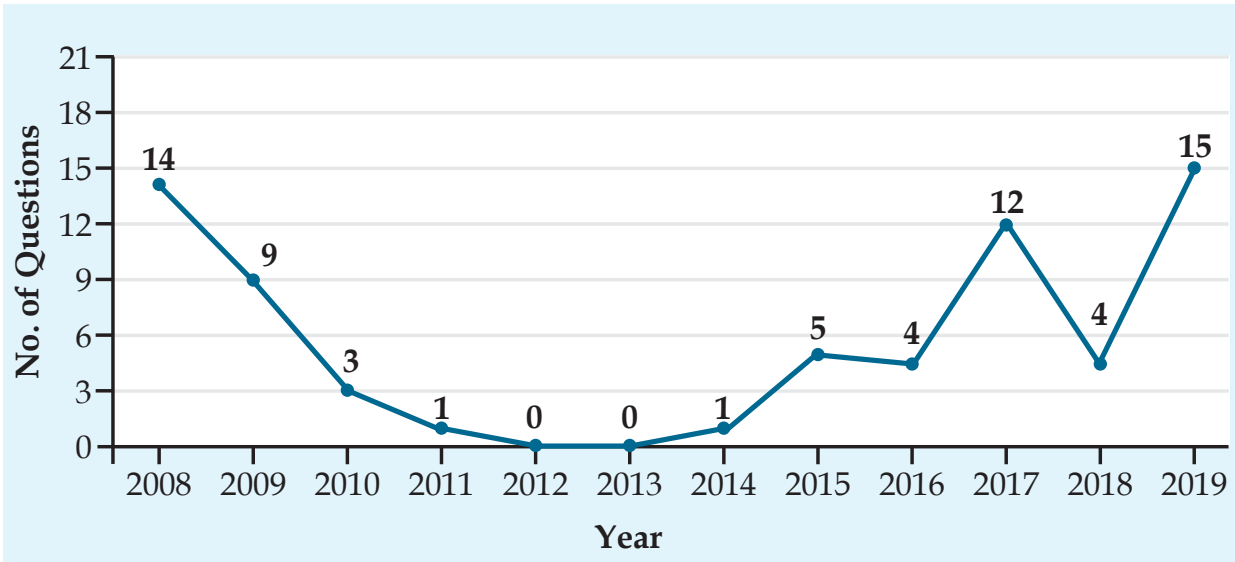
5. The terms 'Event Horizon', 'Singularity', 'String Theory' and 'Standard Model' are sometimes seen in the news in the context of **(2017)**
   (a) Observation and understanding of the Universe
   (b) Study of the solar and the lunar eclipses
   (c) Placing satellites in the orbit of the Earth
   (d) Origin and evolution of living organisms on the Earth

Ans: (a)

- The Big Bang Theory describes how the universe expanded from a very high-density and high-temperature state, and offers a comprehensive explanation for the origin of the universe. Scientists believe that black hole represents the primary stage of Big Bang and would provide significant insight in cosmological order.
- In the centre of a black hole is a gravitational singularity, a one-dimensional point which contains a huge mass in an infinitely small space, where density and gravity become infinite and space-time curves infinitely. The boundary of the black-hole (from where no particles could escape) is known as the Event Horizon. This Event Horizon could be identified from its light emitting particles called Hawking Radiation.
- Both Standard Model and String Theory help us in understanding the particles involved in the black hole formation, thereby these altogether help us to uncover the Universe.

Therefore, option (a) is the correct answer.

CURRENT AFFAIRS/MISCELLANEOUS



Year-wise Trend of Questions

Note: The topic-wise distribution of questions has not been done owing to the lesser number of questions from the subject.

11 CURRENT AFFAIRS/ MISCELLANEOUS

1. The Global Competitiveness Report is published by the **(2019)**

(a) International Monetary Fund
(b) United Nations Conference on Trade and Development
(c) World Economic Forum
(d) World Bank

Ans: (c)

- The Global Competitiveness Report is a yearly report published by the World Economic Forum.
- It seeks to help policy makers understand the complex and multifaceted nature of the development challenges to design better policies, based on public-private collaboration; and to take action to restore confidence in the possibilities of continued economic progress.
- **Parameters of Competitiveness**
  - **Enabling Environment:** Institutions; Infrastructure; ICT adoption; Macroeconomic stability.
  - **Markets:** Product market; Labour market; Financial System; Market size.
  - **Human Capital:** Health; Skills.
  - **Innovation Ecosystem:** Business dynamism; Innovation capability.

Therefore, option (c) is the correct answer.

2. Atal Innovation Mission is set up under the **(2019)**

(a) Department of Science and Technology
(b) Ministry of Labour and Employment
(c) NITI Aayog
(d) Ministry of Skill Development and Entrepreneurship

Ans: (c)

- The Atal Innovation Mission (AIM) is a flagship initiative set up by the NITI Aayog to promote innovation and entrepreneurship based on a detailed study and deliberations on innovation and entrepreneurial needs of the country.
- AIM is envisaged as an umbrella innovation organization that would play an instrumental role in alignment of innovation policies between Central, State and sectoral innovation schemes incentivizing the establishment and promotion of an ecosystem of innovation and entrepreneurship at various levels – higher secondary schools; science, engineering and higher academic institutions; SME/MSME industry, corporate and NGO levels.

Therefore, option (c) is the correct answer.

3. Recently, there was a growing awareness in our country about the importance of Himalayan nettle *(Girardinia diversifolia)* because it is found to be a sustainable source of **(2019)**

(a) anti-malarial drug
(b) biodiesel
(c) pulp for paper industry
(d) textile fibre

Ans: (d)

- Himalayan nettle (*Girardinia diversifolia*) is known to be a sustainable source of light weight, and strong natural textile fiber. It is stronger and more elastic than linen. It is locally known as Bichhu Buti, Nilgiri, Kandali and Dolan.
- Project, Development of Products from Himalayan Nettle, in the Department of Jute and Fiber, University of Kolkata has been recently approved by GoI.

Therefore, option (d) is the correct answer.

4. In India, the use of carbofuran, methyl parathion, phorate and triazophos is viewed with apprehension. These chemicals are used as **(2019)**

(a) pesticides in agriculture
(b) preservatives in processed foods
(c) fruit-ripening agents
(d) moisturising agents in cosmetics

Ans: (a)

- To promote organic farming, Department of Agriculture, Kerala, has ordered a ban on the use of around 17 pesticides since 2011.
- The list of banned pesticides are:
  - **Insecticides:** Cabofuran, Methyl Demeton, Methyl Parathion, Monocrotophos, Phorate, Methymol, Prophenofos, Triazophos, Endosulfan

- **Fungicides:** MEMC, Ediphenphos, Tricyclazole, Oxythioquinox
- **Weedicides:** Anilophos, Paraquat, Thiobencarb, Atrazine

Therefore, option (a) is the correct answer.

5. What is common to the places known as Aliyar, Isapur and Kangsabati? **(2019)**

(a) Recently discovered uranium deposits
(b) Tropical rain forests
(c) Underground cave systems
(d) Water reservoirs

Ans: (d)

Aliyar (Tamil Nadu), Isapur (Maharashtra) and Kangsabati (West Bengal) are water reservoirs, where the water level reached much below the normal capacity.

Therefore, option (d) is the correct answer.

6. Consider the following statements about Particularly Vulnerable Tribal Groups (PVTGs) in India: **(2019)**

1. PVTGs reside in 18 States and one Union Territory.
2. A stagnant or declining population is one of the criteria for determining PVTG status.
3. There are 95 PVTGs officially notified in the country so far.
4. Irular and Konda Reddi tribes are included in the list of PVTGs.

Which of the statements given above are correct?

(a) 1, 2 and 3 (b) 2, 3 and 4
(c) 1, 2 and 4 (d) 1, 3 and 4

Ans: (c)

- In 1973, the Dhebar Commission created Primitive Tribal Groups (PTGs) as a separate category, who are less developed among the tribal groups. The Commission stated that more developed and assertive tribal groups take a major chunk of the tribal development funds, because of which PVTGs need more funds directed for their development. In this context, in 1975, the GoI initiated to identify the most vulnerable tribal groups as a separate category called Primitive Vulnerable Tribal Groups.
- 75 tribal groups have been categorized by Ministry of Home Affairs as Particularly Vulnerable Tribal Groups (PVTGs). PVTGs reside in 18 States and the Union Territory of Andaman and Nicobar Islands. **Hence, statement 1 is correct and statement 3 is not correct.**
- The criteria followed for determination of PVTGs are a pre-agriculture level of technology, a stagnant or declining population, extremely low literacy, and a subsistence level of the economy. **Hence, statement 2 is correct.**
- Irular (Tamil Nadu) and Konda Reddi (Andhra Pradesh) tribes are included in the list of PVTGs. **Hence, statement 4 is correct.**

Therefore, option (c) is the correct answer.

7. Consider the following statements: **(2019)**

1. The United Nations Convention against Corruption (UNCAC) has a 'Protocol against the Smuggling of Migrants by Land, Sea and Air'.
2. The UNCAC is the ever-first legally binding global anti-corruption instrument.
3. A highlight of the United Nations Convention against Transnational Organized Crime (UNTOC) is the inclusion of a specific chapter aimed at returning assets to their rightful owners from whom they had been taken illicitly.
4. The United Nations Office on Drugs and Crime (UNODC) is mandated by its member States to assist in the implementation of both UNCAC and UNTOC.

Which of the statements given above are correct?

(a) 1 and 3 only (b) 2, 3 and 4 only
(c) 2 and 4 only (d) 1, 2, 3 and 4

Ans: (c)

- The United Nations Convention against Corruption (UNCAC) was negotiated in the UN General Assembly in 2003 and entered into force in 2005. It is the first ever legally binding global anti-corruption multilateral treaty. The Convention covers many different forms of corruption, such as bribery, trading in influence, abuse of functions, and various acts of corruption in the private sector. **Hence, statement 2 is correct.**
- The United Nations Convention against Transnational Organized Crime (UNTOC) is a United Nation sponsored multilateral treaty against transnational organized crime. The Convention was adopted in 2000 and came into effect in 2003. The protocol against the smuggling of migrants by land, sea and air, comes under UNTOC. **Hence, statement 1 is not correct.**
- "Returning Assets to their rightful owners from whom they have been taken illicitly", is included under the

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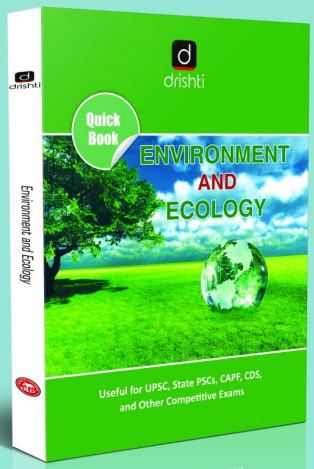

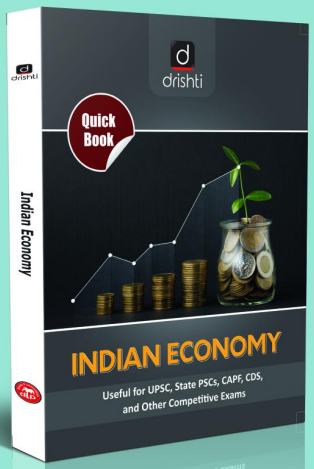

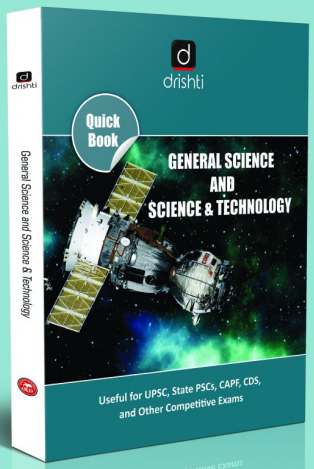

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