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All India Prelims Mock Test – 01 – Answer Key

1. (d)	11. (c)	21. (d)	31. (d)	41. (c)	51. (d)	61. (d)	71. (c)	81. (b)	91. (a)
2. (a)	12. (c)	22. (b)	32. (b)	42. (b)	52. (b)	62. (d)	72. (b)	82. (a)	92. (d)
3. (c)	13. (d)	23. (d)	33. (c)	43. (d)	53. (c)	63. (a)	73. (b)	83. (b)	93. (c)
4. (c)	14. (b)	24. (a)	34. (b)	44. (b)	54. (c)	64. (a)	74. (c)	84. (d)	94. (c)
5. (a)	15. (c)	25. (b)	35. (a)	45. (a)	55. (c)	65. (a)	75. (c)	85. (b)	95. (c)
6. (c)	16. (d)	26. (b)	36. (d)	46. (b)	56. (d)	66. (c)	76. (d)	86. (b)	96. (a)
7. (c)	17. (d)	27. (c)	37. (a)	47. (b)	57. (c)	67. (c)	77. (a)	87. (b)	97. (b)
8. (c)	18. (a)	28. (d)	38. (b)	48. (b)	58. (d)	68. (a)	78. (b)	88. (d)	98. (c)
9. (b)	19. (d)	29. (b)	39. (d)	49. (d)	59. (d)	69. (b)	79. (a)	89. (d)	99. (c)
10. (b)	20. (a)	30. (d)	40. (d)	50. (b)	60. (b)	70. (d)	80. (a)	90. (c)	100. (c)

Q1.

Answer: d

Explanation:

- **Banknotes** are **legal tender** issued by a **central bank**, used as a medium of exchange in an economy. In India, banknotes are issued by **the Reserve Bank of India (RBI)** under the **Reserve Bank of India Act, 1934**.
- **As per Section 26** of Reserve Bank of India Act, 1934, the **Bank is liable to pay the value** of banknote. Being the issuer RBI is liable to pay these on demand. The promissory clause printed on the banknotes i.e., “**I promise to pay the bearer the sum of Rupees ...**” denotes the **obligation** on the part of the Bank towards the holder of the bank note. This clause assures the public of the **note’s value as legal tender**, backed by RBI’s guarantee.

Therefore, option (d) is the correct answer.

Knowledge Box

Key Facts on Bank Notes in India:

- **Issuer:** Banknotes in India are issued by the Reserve Bank of India except for ₹1 notes, which are issued by the Government of India.
- **Material:** The paper currently being used for printing of banknotes in India is made up of virgin cotton.
- **Backed by Assets:** Banknotes are backed by assets such as gold, government securities, and foreign currency reserves this is a requirement as per Section 33 of the RBI Act, 1934.
- **Design Approval:** The design, form, and material of banknotes are approved by the Central Government based on the recommendations from the RBI’s Central Board.
- **Languages:** The language panel on the bank notes in India includes 15 languages in addition to Hindi and English.
- **Printing:** Bank notes are printed at four currency presses, two of which are owned by the Government of India through its subsidiary, Security Printing and Minting Corporation of India Ltd. (SPMCIL) and two are owned by the Reserve Bank, through its wholly owned subsidiary, Bharatiya Reserve Bank Note Mudran Private Ltd. (BRBNMPL). The currency presses of SPMCIL are at Nasik (Western India) and Dewas (Central India). The two presses of BRBNMPL are at Mysuru (Southern India) and Salboni (Eastern India).

Q2.

Answer: a

Explanation:

- **Push and pull payments** represent two distinct methods of payment initiation, offering flexibility based on payer and payee control.
- In **push payments**, the payer takes the initiative to transfer funds to the payee, maintaining complete control over the payment process. Following are the examples of push payments:
 - **Cash:** Direct handover of money by the payer to the payee. **So, point 1 is correct.**
 - **Bank Transfers:** The payer determines the amount and recipient for the transfer. **So, point 2 is correct.**
 - **Standing Orders:** Pre-set instructions by the payer for recurring transfers.
- In **pull payments**, the payee initiates the transaction after receiving authorisation from the payer, allowing the payee to control the timing, amount, and frequency. Following are the examples of pull payments:
 - **Cheques:** Serve as a permission slip for the payee to withdraw funds. **So, point 3 is not correct.**
 - **Card Payments:** Provide the payee with the necessary details to draw funds during the settlement process. **So, point 4 is not correct.**
 - **Direct Debits:** Automated withdrawals from the payer's account, ideal for recurring payments. **So, point 5 is not correct.**

So, only two of the above are examples of push payments.

Therefore, option (a) is the correct answer.

Relevance: The rise of real-time payments in India has increased push payment frauds, where scammers trick individuals into transferring money, with losses expected to double by 2026.

Q3.

Answer: c

Explanation:

- The Reserve Bank of India's **Secured Overnight Rupee Rate (SORR)** is a proposed **new benchmark for interest rate derivatives markets** that aims to replace the existing Mumbai Inter-Bank Offer Rate (MIBOR).
- Unlike MIBOR, which relies on polled rates from market participants, **SORR will be derived from actual transactions in secured money markets**, specifically **basket repo and tri-party repos (TREPS)**. This **trade-based approach** makes the benchmark more resistant to manipulation and more reflective of real market dynamics.
- The RBI has tasked **Financial Benchmarks India Limited (FBIL)** to develop this benchmark, aligning it with global best practices like the Secured Overnight Financing Rate (SOFR).
- SORR's introduction is particularly significant as the **repo market** in government securities accounts for **98% of overnight money markets** and includes **both banks and non-banks**, making it a more representative measure of overnight market funding rates.

Therefore, option (c) is the correct answer.

Relevance: The Reserve Bank of India (RBI) is launching a new interest rate benchmark, the Secured Overnight Rupee Rate (SORR), to better reflect money market conditions.

Q4.

Answer: c

Explanation:

- **Revenue based financing** is a fundraising method where investors provide capital to a company in exchange for a specified percentage of the company's ongoing total gross revenues. It is a non-collateralized form of debt and doesn't require parting with the equity on part of promoters.
- **Revenue-based financing** is a method of raising capital for a business from investors. Startups, especially in e-commerce and B2B software-as-a-service (SaaS), **leaned heavily on revenue-based financing (RBF) in 2024. So, statement 1 is correct.**
- RBF offers a flexible and accessible funding option for startups and small and medium enterprises (SMEs) that often struggle to secure institutional capital or traditional bank loans.
- In a revenue-based financing investment, **investors receive a regular share of the business's income/ revenue** until a predetermined amount has been paid. It is an alternative financing product for digitally-enabled businesses, where they can raise capital in exchange for a percentage of their gross revenue as a monthly repayment, **in addition to a fixed fee between 8-10% of the principal amount. So, statement 2 is not correct.**
- Here, **there are no fixed payments**, they have a directly proportional relationship to how well the firm is doing. This is because payments vary based on the level of the business's income. Thus, **it offers flexibility in repayment based on revenue fluctuations.** Also, it is typically non-collateralized.
- Revenue-based financing also differs from equity financing as the investor does not have direct ownership in the business.

So, Statement-I is correct, but Statement-II is incorrect.

Therefore, option (c) is the correct answer.

Relevance: Startups, especially in e-commerce and B2B software-as-a-service (SaaS), leaned heavily on revenue-based financing (RBF) in 2024

Q5.

Answer: a

Explanation:

- **Wash trading** is a practice where a trader **buys and sells the same security** to create the illusion of higher trading volume and mislead the market. This can involve **collusion** between a trader and a broker or an investor acting as both the **buyer and the seller**. The aim is to make the security appear more active and which in turn may attract real investors.
- **High-frequency trading firms** and **cryptocurrency exchanges** often use wash trading to manipulate prices.
 - **High-frequency trading** relies on **advanced technology** to execute thousands of trades in seconds.
 - In the **cryptocurrency market**, wash trading is used to make certain assets appear more popular and active.
- **Wash trading is considered illegal and unethical** as it **distorts market activity** by creating a false impression that can mislead buyers and sellers and undermines fair & transparent market principles.

Therefore, option (a) is the correct answer.

Knowledge Box

Front Running:

- It is a **fraudulent practice** where **traders or brokers take advantage of non-public information** about large trades by their clients. They **build positions before the trade occurs** in order to **profit from the price movement** once the trade is executed.
- **For example**, if a mutual fund plans to buy a significant number of shares of a stock then the front-runners will purchase the stock ahead of the transaction. When the fund's buy order is executed, the stock price rises due to increased demand which allows the front-runner to sell at a profit.
- While front-running and insider trading are **similar in that both involve using non-public information for profit** but the key difference lies in the parties involved.
 - **In front-running**, typically a broker or fund manager acts on behalf of a client who exploits the information.
 - **In insider trading**, usually an employee of the company or firm is involved whose non-public information about the company's plans is used for personal gain.

Relevance: A federal operation in the USA targeting crypto promoters and traders highlights the persistent issue of fake trades inflating prices in the digital asset market.

Q6.

Answer: c

Explanation:

- In India, **the management of gold reserves** is under the control of the Reserve Bank of India (RBI). The **RBI holds gold reserves** as part of the country's foreign exchange reserves, which are governed by the Foreign Exchange Management Act (**FEMA**), 2002 and the **Reserve Bank of India Act, 1934**.
- It is an important element for **stability of Indian markets and currency**, and serves the following key purposes:
- In order for inflation to not dramatically impact a country's economy, the nation requires **investments that are not tied to the major currencies**. In this case, **gold and the other precious metals** are beneficial. RBI often holds gold as a way to protect the purchasing power of their foreign exchange reserves in the face of inflationary pressures. As it cannot be diluted, gold is able to retain value much better than other forms of currency. **So, point 1 is correct.**
- RBI uses gold as part of their **overall foreign exchange reserves to maintain balance and stability in their currency and financial markets**. Gold is seen as a stable asset that can act as a safeguard against fluctuations in the value of foreign currencies. **So, point 2 is correct.**
- Gold offers a **hedge against the eroding purchasing power of currencies** (mainly the U.S. dollar) due to inflation. Over time inflation eats into the purchasing power of a currency such as the Indian Rupee and make rupee-denominated assets worth less. Gold offers a different narrative, as it tends to hold its value over time when compared with currencies backed by governments, also known as fiat currencies. **So, point 3 is correct.**
- **Gold reserves do not directly influence stock market fluctuations**. Stock market prices are primarily affected by factors such as corporate earnings, investor sentiment, interest rates, and overall economic conditions. While gold can be a safe-haven asset during times of market volatility, RBI does not use gold reserves to directly stabilize stock markets. **So, point 4 is not correct**

So, the Reserve Bank of India maintains gold reserves for only three of the above reasons.

Therefore, option (c) is the correct answer.

Relevance: India stands at the second position in terms of addition to its gold reserve in 2024

Q7.

Answer: c

Explanation:

- The **fiscal glide path** is a strategic approach used by the government to **reduce the fiscal deficit over a period of time**. It aims to ensure that the budget deficit remains within manageable limits while promoting sustainable economic growth. This approach helps prevent negative long-term impacts like inflation and rising national debt. It is particularly relevant when the fiscal deficit is excessively high and needs gradual correction.
- The **NK Singh Committee 2016**, formed under the Narendra Modi government, proposed a fiscal glide path aimed at gradually reducing the fiscal deficit. This path lays out annual targets for the deficit, ensuring the government takes steady and calculated steps towards reducing it. The Committee incorporated an escape clause, allowing a deviation of up to 0.5% of GDP in extraordinary situations. This provision permits the government to surpass its target if deemed necessary. This balance ensures fiscal responsibility without stifling economic recovery.

Therefore, option (c) is the correct answer.

Relevance: India is grappling with significant hurdles in its quest to achieve the fiscal deficit target of 4.5% of GDP by 2025-26.

Q8.

Answer: c

Explanation:

- In India, the **Maximum Retail Pricing** of fertilisers included under the Nutrient Based Subsidy (NBS) scheme is supposed to be market-determined and it is set by the individual companies selling them. The **government merely pays a fixed per-tonne subsidy** on each of these fertilisers, linked to their nutrient content or specific percentage of nitrogen (N), phosphorus (P), potassium (K) and sulphur (S).
- This regime has led to the issues regarding the reasonableness of the Maximum Retail Pricings (MRP), which are often ascribed to be inflated. To curb this practice, the Department of Fertilizers issued guidelines regarding the reasonableness of pricing for these fertilizers.
- The guidelines ("reasonable pricing" control regime) have **prescribed maximum profit margins that will be allowed for fertiliser companies** – 8% for importers, 10% for manufacturers and 12% for integrated manufacturers (those producing finished fertilisers as well as intermediates such as phosphoric acid and ammonia). So, this regime has prescribed **maximum profit margins and not maximum retail prices**.
- The Union Government has brought di-ammonium phosphate (DAP), muriate of potash (MOP) and all other such fertilisers that receive NBS support under **"reasonable pricing" controls**.
- The NBS policy in India covers 22 deregulated fertilizer grades, including **Di-Ammonium Phosphate (DAP), Muriate of Potash (MOP)**, DAP Lite, **Ammonium Sulphate**, and other complex fertilizer grades. **So, points 1, 2 and 4 are correct.**
- **Urea, including the neem-coated urea, is not under "reasonable pricing" control regime.** Maximum retail price (MRP) of urea is **statutorily fixed by the Government of India**. The difference between the delivered cost of fertilizers at farm gate and MRP (exclusive of taxes and charges toward neem coating) payable by the farmer is given as subsidy to the fertilizer manufacturer/importer by the Government of India. **So, point 3 is not correct.**

Therefore, option (c) is the correct answer.

Relevance: Govt brings non-urea fertilisers under price control

Q9.

Answer: b

Explanation:

- **Liberal Constitutionalism** focuses on **limiting State power** to protect **individual freedoms** and uphold **the rule of law**. It is rooted in principles of democracy, individual rights, and separation of powers, ensuring that no branch of government wields **unchecked authority**.
- By providing checks and balances, it safeguards against tyranny and promotes governance based on constitutional principles. Liberal constitutionalism is integral to securing **civil liberties**, **fostering accountability**, and maintaining the balance between **personal autonomy** and collective governance, making it a cornerstone of democratic systems worldwide.

Therefore, option (b) is the correct answer.

Relevance: Former Chief Justice of India, Dr. D.Y. Chandrachud, recently delivered a lecture at Cambridge University, United Kingdom on 'transformative constitutionalism'.

Q10.

Answer: b

Explanation:

- The **Constitution of India** originally consisted of a Preamble and 395 articles divided into 22 Parts and 9 Schedules. Presently, it consists of a Preamble, 448 articles divided into 24 Parts and 12 Schedules.
- **Both Part IV-A (Fundamental Duties) and Part XIV-A (Tribunals) were added by the 42nd Constitutional Amendment Act, 1976. So, points 1 and 4 are correct.**
 - By the **42nd Constitutional Amendment Act, 1976**, Fundamental Duties of the citizens have also been enumerated. Article 51 'A', contained in **Part IV-A** of the Constitution deals with Fundamental Duties.
 - **Part XIV-A** of the Indian Constitution provides for the appointment of tribunals for administrative and other disputes. It was not a part of the Constitution of India 1950, but was added by the **42nd Constitutional Amendment Act, 1976**.
- **Part IX-A** of the Constitution was inserted by the **74th Constitutional Amendment Act, 1992**. It contains provisions for local self government at the urban level (The Municipalities). **So, point 2 is not correct.**
- **Part IX-B** of the Constitution grants constitutional status to co-operative societies and contains provisions for their democratic functioning. It was inserted by the **97th Constitutional Amendment Act, 2011**. **So, point 3 is not correct.**

So, only two of the above were added by the 42nd Constitutional Amendment Act, 1976.

Therefore, option (b) is the correct answer.

Q11.

Answer: c

Explanation:

- **Natural Justice** implies fairness, reasonableness, equity, and equality. Natural Justice is a concept of English Common Law and the counterpart of the American concept of 'procedural due process.'
- It is a legal philosophy that dictates how legal proceedings should be conducted to ensure fairness and justice. In other words, natural justice is the principle of law that protects the rights of individuals to fair treatment in legal proceedings.

- Merely independence of judiciary does not guarantee Natural Justice, rather, it represents **higher procedural principles** developed by judges which every administrative agency must follow in taking any decision adversely affecting the rights of a private individual.
- The principles of natural justice are firmly grounded under various Articles of the Constitution of India.
 - With the introduction of the concept of **substantive and procedural due process in Article 21** of the Constitution, all that fairness included in the principles of natural justice can be read into Article 21 when a person is deprived of his life and personal liberty.
 - In other areas, **Article 14 of the Constitution incorporates the principles of natural justice.** It applies **not only to discriminatory class legislation but also to arbitrary or discriminatory State action.** A violation of natural justice results in arbitrariness; therefore, a violation of natural justice is a violation of the Equality Clause of Article 14.

Therefore, option (c) is the correct answer.

Relevance: The Supreme Court recently held that principles of natural justice are binding on all courts and institutions, highlighting the principle of “audi alteram partem” - the right to be heard as a cornerstone of natural justice.

Q12.

Answer: c

Explanation:

- **Article 19** of the Constitution of India guarantees certain **Fundamental Rights to citizens.** These rights are specifically related to the **freedom of speech, expression, assembly, association, movement, residence, and profession.**
- The **right to remain silent** or freedom for not speaking is implicitly derived from Article 19(1)(a) as adjudged by the apex court in *Bijoe Emmanuel versus the State of Kerala*. **So, point 1 is correct.**
- **The right to fly the national flag** was recognized as a **fundamental right** in *Union of India v. Naveen Jindal (2004)*, deriving it from **Article 19(1)(a)** (freedom of speech and expression). The Supreme Court held that flying the national flag is a form of expression. **So, point 2 is correct.**
- Though the right to practice any profession is part of Article 19 of the constitution of India, **the right of livelihood is derived from Article 21** (right to life). In *Olga Tellis v. Bombay Municipal Corporation (1985)*, the Supreme Court ruled that the right to livelihood is an integral part of the right to life. **So, point 3 is not correct.**
- **The right to information** is derived from **Article 19(1)(a) (freedom of speech and expression).** The Supreme Court has ruled that the right to information is implicit in the right to freedom of speech, as transparency and access to information enable citizens to express themselves more effectively. This right was institutionalized through the Right to Information Act, 2005. **So, point 4 is correct.**

So, only three of the above are derived from Article 19 of the Constitution of India.

Therefore, option (c) is the correct answer.

Relevance: Recently five-judge bench of the Supreme Court noticed the “conflicting view on the status of the right to vote”

Q13.

Answer: d

Explanation:

- **“Naming a Member”** is mentioned in the **Rules of Procedure and Conduct of Business.** It means the drawing of attention of the House by **the Chairman/Speaker to the conduct of a member who disregards the authority of the Chair** or abuses the Rules of the House by persistently and willfully

obstructing the business thereof, with a view to action being taken to **suspend him from the service of the House** for a period not exceeding the remainder of the session.

- If a member is so named by the Speaker; the Speaker shall, on a motion being made forthwith put the question that the member (naming such member) be suspended from the service of the House for a period not exceeding the remainder of the session.
- A member suspended under this rule shall forthwith withdraw from the precincts of the House.

Therefore, option (d) is the correct answer.


Q14.

Answer: b

Explanation:


- The chargesheet, as noted by the Supreme Court, is **nothing but a final report filed by the police regarding their investigation**.
- As per the law the charge sheet must be filed within a specified period of 60 days (can be extended to 90 days). Failure to do so makes the arrest of the accused invalid.
- A **chargesheet is the final report filed by the investigating agency** after the completion of an investigation regarding an offense. It contains details such as the nature of the offense, evidence gathered, statements of witnesses etc. Whether the accused is under arrest, in custody, or has been released, whether any action was taken against him, are all the important questions that a charge sheet answers. **Filing the chargesheet signifies that the investigation is complete, and the matter can proceed to trial. So, statement 1 is correct.**
- As adjudicated by the apex court, chargesheet is **not a 'public document'** and enabling their free public access violates the provisions of the Criminal Code of Procedure as it compromises the rights of the accused, victim, and the investigation agencies. **So, statement 2 is not correct.**
- **Statutory bail** is available when the **investigating agency fails to complete the investigation and file the chargesheet** within the prescribed period (**90 days** for offenses punishable with death, life imprisonment, or imprisonment of at least 10 years; **60 days** for other offenses). **Once the chargesheet is filed within the stipulated time, the accused can no longer claim statutory bail under this provision.** However, the accused may still apply for a regular bail. **So, statement 3 is correct.**


Therefore, option (b) is the correct answer.




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Q15.

Answer: c

Explanation:

- The Constituent Assembly convened **11 sessions** between December 1946 and November 1949. These sessions were instrumental in drafting, discussing, and finalizing the Constitution of India.
- The Drafting Committee, with Dr. B.R. Ambedkar as its chairman, was appointed on **August 29, 1947, through a resolution passed by the Constituent Assembly.**
 - On 29 August 1947, Satyanarayan Sinha moved a motion in the Constituent Assembly to appoint a Drafting Committee to scrutinise and to suggest necessary amendment to the draft Constitution of India prepared by the Assembly. This Drafting Committee would comprise the following members: Alladi Krishnaswami Ayyar, N. Gopalaswami Ayyangar; B.R. Ambedkar, K.M. Munshi, Mohammed Saadulla, B.L. Mitter and D.P. Khaitan.
- The Drafting Committee, chaired by Dr. B.R. Ambedkar, **submitted its draft to the President of the Constituent Assembly** for debate and consideration. B.N. Rau, as the Constitutional Adviser, had prepared an initial draft in 1947, which served as the foundation for the Drafting Committee's work.

Therefore, option (c) is the correct answer.

Q16.

Answer: d

Explanation:

- **Article 21** of the Constitution of India provides the Indian citizens as well as aliens living in the territory of India for the Right to life and personal liberty as a Fundamental right. As per the article 'no person shall be deprived of life or personal liberty except according to the procedure established by law'.
- The scope of Article 21 has been regularly interpreted by the courts. Some of the landmark judgements in this line are:
- **A K Gopalan v. State of Madras, (1950):** It is a landmark case in Constitution law that deals with the interpretation of key fundamental rights under Article 19 and 21 of the Constitution of India. In this case, the Supreme Court has taken a narrow **interpretation of Article 21**. It held that the protection under Article 21 is available only against arbitrary executive action and not from arbitrary legislative action. **So, point 1 is correct.**
- **Maneka Gandhi v. Union of India, (1978):** In this case the SC overruled its earlier judgements in the AK Gopalan case. In a way moving towards the American doctrine of due process of law. The Supreme Court overruled its judgement in the Gopalan case by taking a **wider interpretation of Article 21**. Therefore, it ruled that the right to life and personal liberty of a person can be deprived by a law provided the procedure prescribed by that law is reasonable, fair and just. Further, the court held that the 'right to life' as embodied in Article 21 is not merely confined to animal existence or survival but it includes within its ambit the right to live with human dignity and all those aspects of life which go to make a man's life meaningful, complete and worth living. **So, point 2 is correct.**
- **Aruna Ramchandra Shanbaug vs Union Of India (2011):** In this case the apex court extended the scope of Article 21 to include the right of a dignified death as a key element of personal dignity, which is protected under Article 21. It significantly **broadens the scope of Article 21** of our Constitution and explains the stance of the right to a dignified death. **So, point 3 is correct.**
- **Justice K.S. Puttaswamy (Retd.) & Anr. vs Union of India & Ors. (2017):** The Supreme Court of India's ruling in this case established that the **right to privacy is a fundamental right under Article 21** of the Constitution of India, and that it is an intrinsic part of the right to life and personal liberty. The

Supreme Court held that a fundamental right to privacy is guaranteed under the Constitution of India. **So, point 4 is correct.**

So, all four of the above cases deal with the provisions of Article 21 of the Constitution of India. Therefore, option (d) is the correct answer.

Q17.

Answer: d

Explanation:

- The term “**contempt of court**” is not defined in the Constitution but is explained in the **Contempt of Courts Act, 1971**. According to this Act, contempt of court is categorized as either civil or criminal:
- **Civil Contempt:** Refers to the willful disobedience of any judgment, order, writ, or other court processes, or the willful breach of an undertaking given to a court.
- **Criminal Contempt:** Includes the publication of any material or the commission of an act that:
 - Scandalizes or lowers the authority of a court,
 - Prejudices or interferes with the due course of judicial proceedings, or
 - Obstructs or interferes with the administration of justice in any other way.
- Under **Articles 129 and 142 of the Constitution of India**, the Supreme Court has been vested with power to punish for contempt of Court including the power to punish for contempt of itself.
- In case of contempt other than the contempt referred to in Rule 2, Part-I of the **Rules to Regulate Proceedings for Contempt of the Supreme Court, 1975**, the Court may take action
 - **Suo motu, or**
 - **on a petition made by the Attorney General, or Solicitor General, or**
 - **on a petition made by any person**
- In the case of a criminal contempt with the consent in writing of the Attorney General or the Solicitor General.

Therefore, option (d) is the correct answer.

Q18.

Answer: a

Explanation:

- The **Vice-President** is the ex-officio Chairperson of the Rajya Sabha. During any period when the Vice-President acts as President or discharges the functions of the President, s/he does not perform the duties of the office of the Chairperson of Rajya Sabha.
- Unlike the Speaker, who is a member of the Lok Sabha, **the Chairperson is not a member of the Rajya Sabha.**
- The Vice-President **cannot preside over a sitting of the Rajya Sabha as its Chairperson when a resolution for her/his removal is under consideration.** However, s/he can be present and speak in the House and can take part in its proceedings, **without voting**, even at such a time. **So, statement 1 is correct.**
 - This is unlike the Speaker, who can vote in the first instance when a resolution for her/his removal is under consideration of the Lok Sabha.
- But like the Speaker, the Chairperson also does not vote in the first instance. S/he too **can cast a vote in the case of an equality of votes. So, statement 3 is not correct.**

- The Speaker of Lok Sabha presides over a joint sitting of the two Houses and the Deputy Speaker, in his absence. If the Deputy Speaker is also absent from a joint sitting, the Deputy Chairperson of Rajya Sabha presides. If s/he is also absent, such other person as may be determined by the members present at the joint sitting, presides over the meeting. It is clear that the **Chairperson of Rajya Sabha does not preside over a joint sitting** as s/he is not a member of either House of Parliament. **So, statement 2 is correct.**

Therefore, option (a) is the correct answer.

Relevance: Recently, there was news of opposition parties considering bringing a resolution for the removal of the Vice President of India, who serves in the dual role as the Chairman of the Rajya Sabha.

Q19.

Answer: d

Explanation:

- **The Public Account Committee (PAC)** is a committee of selected Members of Parliament, constituted by the Parliament of India, for the purpose of auditing the revenue and expenditure of the Government of India.
- It serves as a check on the government, especially with respect to its expenditure bill, and **its primary function is to examine the audit report of the Comptroller and Auditor General (C&AG)** after it is laid in Parliament.
- The main function of the PAC is to ascertain whether the money granted by Parliament has been spent by the government **'within the scope of the demand'**.

Therefore, option (d) is the correct answer.

Relevance: Recently, the Lok Sabha Speaker constituted six new Parliamentary Committees, including the Public Accounts Committee (PAC).

Q20.

Answer: a

Explanation:

- The **Parliament of India** can hold the Government accountable for its decisions, and scrutinise its functioning. This may be done using various methods including, during debates on Bills or issues on the floor of Parliament, by posing questions to Ministers during Question Hour, and in parliamentary committees.
- **Motion of Thanks** is a parliamentary procedure to express gratitude for the President's Address at the commencement of Lok Sabha. At the end of the discussion, the motion is put to vote. **This motion must be passed in the House.** Its failure to be passed in Lok Sabha is indicative that the treasury has lost its majority in the house, hence, it becomes imperative on the council to resign from the government. **So, point 1 is correct.**
- A member can initiate a **privilege motion** when they believe a minister has violated the privileges of the House or its members by withholding crucial information about a case or providing inaccurate and manipulated facts. The primary aim of this motion is to express disapproval and criticise the respective minister's actions. However, the passing of this motion **does not require the government to resign.** **So, point 2 is not correct.**
- **The censure motion** is moved for censuring the Council of Ministers for specific policies and actions. **Even if it is passed in the Lok Sabha, the Council of Ministers need not resign from the office.** **So, point 3 is not correct.**
- During the stage of voting on demands for grants of the budget, the members of Parliament can discuss the details of the budget. They can also move motions to reduce any demand for grants. Such motions are

called 'cut motion'. If a Cut Motion is passed, it is considered a **no-confidence vote** against the Government and the Government has to resign. **So, point 4 is correct.**

Therefore, option (a) is the correct answer.

Q21.

Answer: d

Explanation:

- **Greenhushing** occurs when firms under report or **strategically withhold information about their environmental goals and achievements**. Greenhushing firms don't advertise their green credentials or deliberately remain silent about their future commitments to environmental sustainability.
- Greenhushing is when companies take steps to stay quiet about their environmental goals, efforts and achievements and keep their sustainability credentials secret.
- **Greenhushing can happen for different reasons:**
 - In some countries, firms stay silent about their environmental efforts to avoid costly litigation.
 - Some firms don't advertise their sustainable products because consumers associate "green" with lower quality.
 - Carbon neutral certified firms can remain silent for two major reasons:
 - Lack of customer demand and
 - To avoid greenwashing accusations.

Therefore, option (d) is the correct answer.

Relevance: Australia hosts a rising number of carbon-neutral certified firms, yet many choose not to advertise their efforts, a global trend known as greenhushing.

Q22.

Answer: b

Explanation:

- A scheme called Biosphere Reserve (BR) has been implemented by the Government of India since 1986. A Biosphere Reserve consists of three zones: Core Areas; Buffer Zone and Transition Zone.
- Existing legally protected areas (National Parks, Wildlife Sanctuary, Tiger Reserve and reserve/protected forests) may become part of the BR, **without any change in their legal status. So, statement 1 is not correct.**
- The Biosphere Reserve Division of India's Ministry of Environment, Forest and Climate Change (MoEFCC) **implements a centrally sponsored scheme (CSS)** namely Conservation of Natural Resources and Ecosystems (CNRE), of which, a subscheme for Biosphere Reserve has been formulated. **As a step towards management of a Biosphere Reserve, the MoEFCC provides financial assistance under the said centrally sponsored scheme**, for certain activities. The implementing agency for this centrally sponsored scheme is the State Forest Department. The targeted beneficiaries of the scheme are primarily the population dependent on the Biosphere Reserves. **So, statement 2 is correct.**
- The objectives of designation of a Biosphere Reserve include:
 - ensuring in-situ conservation (at all levels of biodiversity ranging from genes to ecosystems) in totality as part of wider ecosystem;
 - widening the understanding (through research and monitoring) of components of ecosystems;
 - **achieving integrated development (improved quality of life for indigenous communities living in and around) of the area. So, statement 3 is correct.**

So, only two of the statements given above are correct.

Therefore, option (b) is the correct answer.

Knowledge Box

Man and Biosphere (MAB) programme:

- UNESCO has introduced the designation 'Biosphere Reserve' for natural areas to minimize conflict between development and conservation. BRs are nominated by the national government which meet a minimal set of criteria and adhere to a minimal set of conditions for inclusion in the world network of Biosphere reserves under the Man and Biosphere Reserve Programme of UNESCO.
- Biosphere Reserves are internationally recognized within the framework of UNESCO's Man and Biosphere (MAB) programme, after receiving consent of the participating country.

Relevance: Rajaji Raghati Biosphere (RRB) is a 35-acre private forest initiative led by ecologist Vijay Dhasmana.

Q23.

Answer: d

Explanation:

- **Energy crops** are plants specifically grown to **produce energy** in the form of **biofuels** (like bioethanol and biodiesel) or **biomass** (for heat and electricity generation). These crops are cultivated for their high energy yield and sustainability. Common examples include grasses, trees, and certain oil-producing plants.
- **Switchgrass** is a perennial grass widely used as a biomass feedstock for producing **biofuels**, including cellulosic ethanol, and for generating energy in biomass power plants. **So, point 1 is correct.**
- **Sugarcane** is a major source of **bioethanol**, produced from the fermentation of its sugars. It is widely used in countries like Brazil for renewable fuel production. **So, point 2 is correct.**
- **Jatropha** is a hardy, oilseed-bearing plant used for producing **biodiesel**. The seeds of the Jatropha plant contain up to 40% oil, which can be extracted and processed into biodiesel. **So, point 3 is correct.**
- **Corn** is a key first-generation **energy crop**, widely used for producing bioethanol. The starch in corn kernels is fermented to produce ethanol, which is blended with gasoline as a biofuel. **So, point 4 is correct.**

So, all four of the above are considered as energy crops.

Therefore, option (d) is the correct answer.

Relevance: A recent study finds that strategic planting of 'energy' crops could mitigate biodiversity loss.

Q24.

Answer: a

Explanation:

- A new report from the EU's Copernicus Climate Change Service confirms that **2024 was the first year on record with a global average temperature exceeding 1.5°C above pre-industrial levels**. All continents except Australasia and Antarctica experienced their hottest year on record, with 11 months of the year exceeding the 1.5°C level. **So, statement 2 is correct.**
- The **earth's climate experienced its hottest year in 2024**. The previous hottest year on record was 2023. All ten of the hottest years on record have fallen within the last decade. But this is the first time a calendar year has exceeded the 1.5°C threshold. The planet's average temperature in 2024 was 1.6 degrees Celsius higher than in the 1850-1900 pre-industrial period.
- Climate change is worsening storms and torrential rainfall, because **a hotter atmosphere can hold more water**, leading to intense downpours. **Atmospheric water vapour reached a record high in**

2024, and the U.S. National Oceanic and Atmospheric Administration said it was the third-wettest year on record. **So, statement I is correct.**

- There was a record amount of water vapour in the atmosphere in 2024, according to the European Union's Copernicus Climate Change Service (C3S). C3S said the water vapour in 2024 was 4.9 per cent above the 1991-2020 average. This means that the water vapour was at its highest in at least 33 years.

So, both Statement-I and Statement-II are correct and Statement-II explains Statement-I.

Therefore, option (a) is the correct answer.

Relevance: The year 2024 was the most humid on record, along with being the hottest year on record with a temperature anomaly of 1.55°C.

Q25.

Answer: b

Explanation:

- **The Western Ghats**, a UNESCO World Heritage Site and one of the eight "hottest hotspots" of biological diversity in the world, is home to some of the rarest plants and animal species. The Western Ghats has a high level of endemism with nearly 54% of the plant species here being endemic to the region.
- *Myristica magnifica* is a plant native to India and is endemic to the Western Ghats, in Kerala and Karnataka. It is also known as the **magnificent nutmeg**. The IUCN Red List classifies it as an endangered species. **So, point 2 is correct.**
- *Dicliptera polymorpha* is a plant species that is endemic to the Western Ghats of India. It thrives on slopes in open grasslands of the northern Western Ghats, an area exposed to extreme climatic conditions such as summer droughts and frequent human-induced fires. Despite these harsh conditions, the species has adapted to survive and bloom twice a year. **So, point 3 is correct.**
- **Red Sanders** is a flora species that are **endemic to a distinct tract of forests in the Eastern Ghats** region of Andhra Pradesh. It usually grows in rocky, degraded and fallow lands with Red Soil and a hot and dry climate. **So, point 1 is not correct.**
- **Red Vanda** (*Renanthera imschootiana*) is a warm climate orchid **endemic to Northeast India and neighboring countries**. It is not found in the Western Ghats. **So, point 4 is not correct.**

So, only two of the above species are endemic to Western Ghats.

Therefore, option (b) is the correct answer.

Relevance: Recently, researchers discovered a new species of the genus *Dicliptera* in the Northern Western Ghats of India and named it as *Dicliptera polymorpha*.

Q26.

Answer: b

Explanation:

- **Fukuoka Technique or Seed ball planting** method was developed by a Japanese farmer and philosopher Masanobu Fukuoka in southern Japan.
- The technique is considered as **a natural method of farming that requires no machines, no chemicals and very little weeding**. By using seed balls, lands are cultivated without any preparation of soil. This kind of cultivation is highly useful for re-vegetation of decertified lands and protects soil from erosion and climate risks such as landslides.

- Fukuoka technique **uses minimal human interventions** allowing ecosystems to determine the **yield of the land** for nurturing more resilient trees, healthier soil, plant diversity and a smaller workload for farmers.
- Advantages of seed balls:
 - It is simple and easier to make seed balls without machines
 - Easier for reforestation and plantation in difficult terrains
 - Contribute to protect soil, environment and livelihood
 - It is an organic technique and doesn't use any chemicals
 - It is a low-cost method compared to traditional afforestation/reforestation techniques
 - It requires low maintenance.

Therefore, option (b) is the correct answer.

Knowledge Box

- **Aeroponics** is the process of growing plants in an air or mist environment **without the use of soil** or an aggregate medium (known as geaponics). This is an alternative method of soil-less culture in growth-controlled environments. Here, roots are suspended in the air and irrigated with a nutrient-dense mist.
- **Hydroponics** is the technique of growing plants using a **water-based nutrient solution rather than soil**. Here, plant roots are submerged in a solution of water and nutrients.

Q27.

Answer: c

Explanation:

- A **living fossil** is a species that hasn't evolved significantly for millions of years and closely resembles ancestors found in the fossil record.
- Charles Darwin coined the term "living fossil" in 1859 to describe **living species that still looked like their ancestors** from millions of years ago and were often the last surviving lineage. Anatomically, these species tend to look unchanged, although genetically species are always evolving.
- **Cockroach is considered a living fossil.** Cockroaches belong to one of the oldest insect orders, **Blattodea**, which is made up of cockroaches and termites. Fossil records for early cockroaches date back more than 300 million years ago to the Upper Carboniferous period. There are approximately 4,000 cockroach species found worldwide and **they look similar to their fossil counterparts. So, point 1 is correct.**
- **Sea Urchins** are members of a large group of marine invertebrates in the phylum Echinodermata (spiny skinned animals) that also include starfish, sea cucumbers, sea lily and brittle stars. Sea-urchins **do not qualify as living fossils** as they have undergone significant evolutionary changes. **So, point 2 is not correct.**
- **Goblin Shark is considered a living fossil.** It is found in the Pacific, Atlantic and Indian Oceans. This ancient species first came to existence 125 million years ago. It has a long flat snout which is filled with electroreceptors, enabling it to sense the electrical fields of its prey. **So, point 3 is correct.**
- **Owls are not living fossils.** Owls are intriguing nocturnal birds with specialized adaptations like silent flight and exceptional hearing. With over 200 species globally, they contribute significantly to ecosystems. **So, option 4 is not correct.**

Therefore, option (c) is the correct answer.

Knowledge Box

Some other living fossil species are:

- **Horseshoe crab:** Horseshoe crabs first appeared over 300 million years ago, making them even older than the non-avian dinosaurs. The species hasn't evolved much since.
- **Duck-billed platypus:** It is an aquatically adapted mammal that first appeared more than 110 million years ago.
- **Amami rabbit:** It is found living only on two small islands off the coast of Japan, it is an endangered species with only 5,000 remaining.
- **Nautilus:** These are cephalopods, or marine mollusks and one of the Earth's oldest "living fossil" species. These spiral-shelled creatures have hardly changed since they first appeared over 500 million years ago.
- **Komodo dragon:** The Komodo dragon is an ancient venomous reptile that has existed for millions of years. It lives on Indonesia's Lesser Sunda group of islands, including the island of Komodo.
- **The Ginkgo tree:** It is an incredibly resilient and stinky tree species. Fossil records of Ginkgo leaves show that it has barely changed for more than 200 million years.
- **The Coelacanth:** It is an elusive, deep-sea dwelling ancient bony fish found off the coasts of Africa and Indonesia. Coelacanths first emerged in the fossil record 400 million years ago during the Devonian Period (419.2 to 358.9 million years ago).



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Q28.

Answer: d

Explanation:

- A new study states that to achieve a temperature reduction of 1.6 degrees Celsius, about **five million tonnes of diamonds** would need to be sprayed into Earth's upper atmosphere every year.
- The study has argued that **spraying millions of tonnes of diamond dust** in the Earth's upper atmosphere every year **could help cool down the Earth and combat global warming**.
- The central idea here is to **scatter material that can reflect solar radiation into Space and prevent it from reaching Earth**, thereby cooling down the planet. Such solutions are called geo-engineering.

Therefore, option (d) is the correct answer.

Knowledge Box

- **Geoengineering** refers to any large-scale attempt to alter the Earth's natural climate system to **counter the adverse impacts of global warming**.
- **Solar Radiation Management (SRM)** is one of the geoengineering options being explored. Under this, materials are proposed to be deployed in Space to reflect incoming solar rays and prevent them from reaching Earth.

Relevance: The concept of spraying diamond dust into Earth's upper atmosphere as proposed in the recent Geophysical Research Letters study is highly relevant in the context of combating climate change.

Q29.

Answer: b

Explanation:

- **Druzhba Pipeline is one of the world's biggest crude oil pipeline networks.** The total length of the pipeline system, including all its branches, is around 5500 km. **The official beginning of the Druzhba network is in Almet'yevsk in the Russian Federation**, where pipelines carrying crude oil from Siberia, the Urals and the Caspian Sea meet. **Druzhba runs to Mozyr in Belarus**, where it splits into northern and southern branches. The north branch continues via Belarus and Poland to Germany. **So, pair 1 is correctly matched.**
- **TurkStream delivers natural gas from Russia to Turkey.** Two parallel pipelines begin on the Russian coast near the town of Anapa, traveling 930 km across the Black Sea at depths greater than 2 km to a gas receiving terminal in the Thrace region of Turkey. **So, pair 2 is not correctly matched.**
- **The Yamal-Europe gas pipeline** is a major pipeline that supplies **Russian gas to Western Europe**. Measuring more than 2,000km in length, it is one of the longest land-based gas pipelines in the world. **So, pair 3 is correctly matched.**
- Originally known as the First West-East Gas Pipeline, which became operational in 2004, **the West-East Gas Pipeline Project is now a natural gas supply system stretching from across China from east to west**, including the completed First and Second West-East Gas Pipelines as well as the ongoing Third West-East Gas Pipeline. Consisting of trunk and branch pipelines and gas storages, the project delivers natural gas from Western China and Central Asia to the major target consumer markets in Southeast China and users along the lines. **So, pair 4 is not correctly matched.**

So, only two of the above pairs are correctly matched.

Therefore, option (b) is the correct answer.

Relevance: Energy transportation infrastructure is in the news after the destruction of the Nordstream pipeline post-Russia-Ukraine war.

Q30.

Answer: d

Explanation:

- **Irrigation intensity** is a crucial concept in agriculture, especially in regions with limited rainfall or where consistent water supply is needed for optimal crop growth.
- **Irrigation intensity refers to the percentage of net irrigated area** (area irrigated through any source once in a year for a particular crop) **to the net sown area** (area sown with crops, but counted only once).
- It measures how intensively irrigation resources are being utilized to support agricultural activities.

Therefore, option (d) is the correct answer.

Q31.

Answer: d

Explanation:

- **Aleppo** is a city in **Syria** and is considered one of the oldest continuously inhabited cities in the world.
- **Golan Heights** is a hilly area overlooking the **upper Jordan River valley** on the west. The area was part of extreme southwestern Syria until 1967, when it came under Israeli military occupation and in 1981 Israel unilaterally annexed the part of the Golan it held. The area's name is from the biblical city of refuge Golan in Bashan.
- **West Bank** is an area of the former British-mandated (1920–47) territory of Palestine, west of the Jordan River. It was occupied by **Israel in 1967**.
- The **Gaza Strip**, also known as Gaza, is a small territory located on the eastern coast of the **Mediterranean Sea**. In the Six-Day War of June 1967, the Gaza Strip was taken by Israel.



So, the correct sequence of the locations from North to South is: **Aleppo - Golan Heights - West Bank - Gaza Strip**.

Therefore, option (d) is the correct answer.

Q32.

Answer: b

Explanation:

- The **amount of organic matter** in any particular soil is the result of a wide variety of environmental, soil and agronomic influences. Some of these, such as climate and soil texture, are naturally occurring. The amount of organic matter in a soil is the **result of all the additions and losses of organic materials** that have occurred over the years.

- Higher average temperatures lead to less soil organic matter. Faster decomposition with warmer temperatures becomes the dominant influence determining soil organic matter levels.
- In the **arctic and alpine regions** there is not a lot of organic matter added to soils each year because of the very short season during which plants can grow. But **arctic soils have high levels of organic matter because of the extremely slow decomposition rate caused by cold (and freezing) temperatures. So, statements 1 and 2 are correct.**
- The arctic regions have a **shorter growing season, hence less vegetation.** However, it does not result in high levels of organic matter. Thus, it does not explain the Statement-I. **So, statement 3 is correct.**
- As we move towards the equator, the climate **gets warmer** and **more vegetation is produced because the growing season is longer**, and the rate of decomposition of organic materials in soils increases because soil organisms work more rapidly and are active for longer periods of the year at higher temperatures.

So, both Statement-II and Statement-III are correct, but only one of them explains Statement-I. Therefore, option (b) is the correct answer.

Q33.

Answer: c

Explanation:

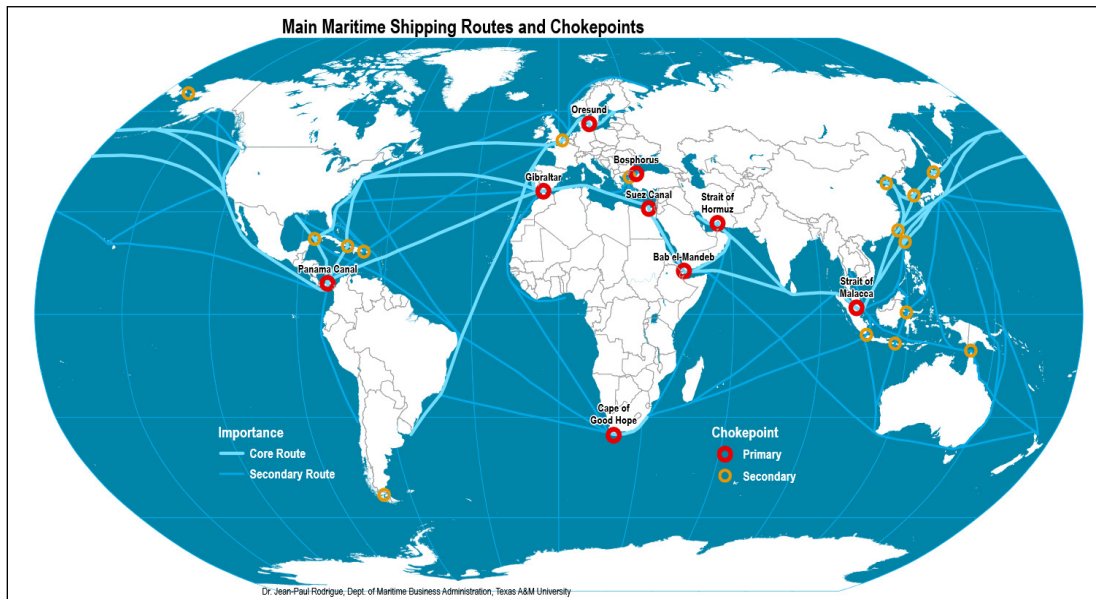
- **Cyclones** are centers of low pressure surrounded by closed isobars having increasing pressure outward and closed air circulation (convergent air circulation) from outside towards the central low pressure in such a way that winds blow in anti-clockwise and clockwise directions in the northern and the southern hemisphere respectively. There are two types of cyclones: **Tropical cyclones and Temperate cyclones** (extratropical cyclones).
- Temperate cyclones are atmospheric disturbances having low pressure in the center and increasing pressure outward. The convergence of the **cold front and the warm front** in the temperate latitude cyclones is conducive for the development of these mid-latitude cyclones. **Unlike tropical cyclones, they do not need the minimum Sea Surface Temperature (SST).** Tropical cyclones need a minimum 26.5°C Sea Surface Temperature. **So, statement 1 is correct.**
- The general direction of temperate cyclones is from **west to east under the influence of the westerlies**, which are **prevailing winds** in the middle latitudes. Likewise, tropical cyclones move under the influence of **prevailing trade winds**. However, the general direction of tropical cyclones is from **east to west. So, statement 2 is not correct.**
- **Further**, temperate cyclones adopt a more southerly course covering the Mediterranean Sea, while in summer they move northward giving no rainfall in the Mediterranean region. This is **due to the apparent movement of the Sun.**
- **Temperate cyclones have less intense rainfall** due to being the **frontal in nature**. Whereas, the tropical cyclones have much more intense rainfall because deep **thermal convection is their source of energy**. Thus, **only tropical cyclones cause convective rainfall. So, statement 3 is correct.**

Therefore, option (c) is the correct answer.

Q34.

Answer: b

Explanation:



- The central axis of the global maritime shipping system is a **Circum-equatorial Corridor** linking **North America, Europe and Pacific Asia** through the **Suez canal, the strait of Malacca, and the Panama canal**. So, points 2, 3 and 4 are correct.
- These routes support the bulk of the traffic, but numerous other routes exist (namely for coastal shipping), depending on the origin and destination of the maritime shipment. Transatlantic and transpacific traffic concerns a wide variety of ports, so there are numerous routes, most of them having a path along the great circle. Trans-indian ocean traffic is predominantly intermediary between Pacific Asia and Europe, implying a series of clearly defined routes between the strait of Malacca and Bab el-Mandeb.
- Due to geography, geopolitics and trade flows, specific locations play a strategic role in the global maritime network. They are labeled as chokepoints and can be classified as primary chokepoints (limited cost-effective maritime shipping alternatives) and secondary chokepoints (maritime routes that have alternatives).
- The **strait of Bosphorus grants access to the Black Sea**. It is not present along the Circum-equatorial corridor but connects it in the Mediterranean Sea, and acts as a primary chokepoint. So, point 1 is not correct.

Therefore, option (b) is the correct answer.

Q35.

Answer: a

Explanation:

- **Tranquilizers** are a class of chemical compounds **used for the treatment of stress, and mild or even severe mental diseases**. They relieve anxiety, stress, irritability or excitement by inducing a sense of well-being.
 - Iproniazid and **phenelzine** are two such drugs.
 - Derivatives of barbituric acid viz., veronal, amytal, nembutal, luminal and seconal constitute an important class of tranquilizers. These derivatives are sleep producing agents.
 - Some other substances used as tranquilizers are **valium** and **serotonin**.

- Some tranquilizers namely, **chlordiazepoxide** and meprobamate, are relatively mild tranquilizers suitable for relieving tension.
- **Analgesics** reduce or abolish pain without causing impairment of consciousness, mental confusion, incoordination or paralysis or some other disturbances of the nervous system.
 - **Aspirin and paracetamol** belong to the class of non-narcotic analgesics.
 - **Morphine** and many of its homologues are **narcotic analgesics**.

So, expect paracetamol, which is an analgesic, all the above chemicals are tranquilizers.

Therefore, option (a) is the correct answer.

Knowledge Box

Antiseptics:

- They are applied to living tissues, such as wounds, cuts, ulcers, and diseased skin surfaces, to prevent infection.
 - Examples include furacin and **soframycin**, which, unlike antibiotics, are not ingested.
 - A commonly used antiseptic, Dettol, is a mixture of **chloroxylenol** and terpineol.
 - **Iodoform is another antiseptic** used for wound care. Additionally, boric acid in a dilute aqueous solution serves as a mild antiseptic for the eyes.

Antibiotics:

- They are used as drugs to treat infections because of their low toxicity for humans and animals. Examples are **sulfonamides, Penicillin, Erythromycin, Aminoglycosides, Tetracycline, Ofloxacin, Chloramphenicol**, etc.

Q36.

Answer: d

Explanation:

- **The audible range of sound** for human beings extends from about 20 Hz to 20000 Hz (one Hz = one cycle/s).
- Sounds of frequencies below 20 Hz are called infrasonic sounds or infrasound. **Elephants** produce sound in the **infrasound range**. **So, point 5 is not correct.**
- Frequencies higher than 20 kHz are called ultrasonic sound or ultrasound. **Ultrasound is produced by animals such as dolphins, bats and porpoises.** Whales generally produce infrasounds but some species of the **Toothed Whales have evolved to use intense ultrasonic clicks to echolocate prey.** **So, points 1, 2, 3 and 4 are correct.**

Therefore, option (d) is the correct answer.

Relevance: The researcher found a link between noise pollution and ultrasonic hearings.

Q37.

Answer: a

Explanation:

- Generally **light oscillates in every direction**. But, in certain parts of the cosmos strong magnetic fields drive particles of incredibly high speeds, creating highly organized or polarized light.
- By analyzing this **polarized light** one can determine the location, distance as well as degree of inclination from the observing point of the **celestial body**. Thus, **X-Ray polarization** serves as a crucial diagnostic tool for examining the radiation mechanism and **geometry of celestial sources**. **So, statement 1 is correct.**

- **Analyzing X-Ray polarization signatures** enables measurements of the mass and spin of accreting black holes, comprehension of the source's geometric arrangement and local properties, exploration of accretion flow, outflow and jets, investigation into the nature of X-Ray scattering and reflection mediums, estimation of strong magnetic fields, and revelation of the radiation zone and particle acceleration processes in pulsars, among other applications.
- **Each celestial process manifests its distinct polarization signature within appropriate energy bands, depending on the involved energetics.** Instruments like X-ray polarimeters are designed to investigate X-ray polarization signatures emanating from bright X-ray sources. The information on polarization provides a deeper insight to the processes, as well as the local anisotropies of the fields (electric/magnetic/gravitational). **So, statement 2 is correct.**

So, both Statement-I and Statement-II are correct and Statement-II explains Statement-I.

Therefore, option (a) is the correct answer.

Relevance: India is set to launch its first X-Ray Polarimeter Satellite (XPoSat), aiming to investigate the polarization of intense X-Ray sources.

Q38.

Answer: b

Explanation:

- **Stereoscopy** is the primary technology used in **3D glasses**. Stereoscopy is the technique of presenting **two slightly different images to each eye**. These images mimic the natural visual input from each eye in real life, where **each eye perceives a slightly different angle of the scene**. When combined, these images **create a 3D effect by simulating depth**, which is the basis of 3D glasses technology.
- **Binocular vision** gives us **depth perception** and allows us to tell which objects in our line of sight are **closer or farther away**. It relies on the distance between our eyes to present us with two different perspectives on the same thing. In order to see a movie in 3D, each of our eyes needs to see something different, and we need to stop our brain from merging them together.
- When we look at a 3D projection through 3D glasses, our brain is using a technique called **stereoscopy** to create the illusion of depth. This is where the brain takes two separate images and processes them so that the image appears to “pop” out. If we take off your glasses while watching a 3D movie, we will find that it is impossible to focus on the image displayed. This is because these movies are forcing two different layers of imaging on top of each other to create a 3-Dimensional effect.

Therefore, option (b) is the correct answer.

Knowledge Box

Different types of 3D glasses:

- 3D glasses come in several types, each using unique technology to create the illusion of depth:
 - **Anaglyph:** The classic red-and-blue lenses separate images by colour, sending one to each eye. While simple and affordable, they can distort colours.
 - **Polarised:** These use polarised light to filter two images, one for each eye, maintaining natural colours and providing a more immersive experience.
 - **Active Shutter:** These high-tech glasses sync with the screen to alternately block each eye in rapid succession, creating a sharp and detailed 3D effect.

Q39.

Answer: d

Explanation:

- **Geostationary satellites** placed in a geostationary orbit are visible from a particular spot on the earth at every time, that is the satellites placed here rotate along the axis of the earth, thus providing an ideal feature for **communication satellites**.
- Geostationary orbits (GEO) are used extensively in **telecommunications, weather monitoring**, etc. These orbits allow satellites to remain **stationary relative to a fixed location on earth**, as they match the planet's rotation, enabling continuous coverage over specific areas.
- Geostationary orbits are located at an altitude of **35,786 km**, providing a **broad view of earth** but **not suitable for high-resolution Earth observation**. High-resolution imagery requires satellites to be in **Low Earth Orbit (LEO)**, closer to Earth's surface, where finer details can be captured. **So, statement I is not correct.**
- Satellites in geostationary orbit fly with a speed exactly matching earth's rotation, **making them appear stationary over a fixed point on the equator**. This unique feature makes GEO suitable for applications requiring continuous coverage of a specific region. **So, statement 2 is correct.**

So, Statement-I is incorrect, but Statement-II is correct.

Therefore, option (d) is the correct answer.

Q40.

Answer: d

Explanation:

- **Quantum tunneling** can be explained using the wave-particle duality of matter.
- According to this principle, all matter has both wave-like and particle-like properties. When a particle encounters a **potential energy barrier**, it can behave like a wave and spread out over the barrier. If the wave function of the particle extends beyond the barrier, there is a probability that the particle will be found on the other side of the barrier, even if its energy is lower than the barrier's height.
- In **quantum tunneling**, the **probability of tunneling** depends on the **height** and **width** of the energy barrier; higher and wider barriers significantly reduce this probability. It is a crucial principle in several real-world applications, including **semiconductors, flash memory** and **nuclear fusion** in stars. The ability of particles to tunnel is a direct consequence of their **wave-particle duality**, one of the cornerstones of quantum theory.

Therefore, option (d) is the correct answer.

Knowledge Box

- **Quantum interference** occurs when **wave-like properties of particles overlap**, leading to constructive or destructive interference patterns. It is fundamental in phenomena like the **double-slit experiment**, showcasing the wave behavior of particles.
- **Quantum entanglement** describes a situation where **two or more particles become interconnected**, such that the state of one immediately influences the state of the other, regardless of distance. This phenomenon is key to **quantum computing** and **quantum cryptography**.
- **Quantum superposition** is the principle where a particle exists in **multiple states simultaneously** until measured. This concept is central to **Schrödinger's cat thought experiment** and the functioning of **quantum bits (qubits)** in quantum computers.

Q41.

Answer: c

Explanation:

- *Bacillus thuringiensis* (**Bt**) is a soil bacterium that produces **insecticidal proteins** during its sporulation phase of growth. The **Cyt and Cry toxins** are different pore-forming proteins produced by *B. thuringiensis* bacteria, and **used in insect-pests control**. So, pair 1 is correctly matched.
 - Cry proteins are specifically toxic to the insect orders Lepidoptera, Coleoptera, Hymenoptera and Diptera and also to nematodes.
- *Agrobacterium tumefaciens* is a gram-negative bacterium which is the causative agent of crown-gall disease in many dicotyledonous plant species. The **T-DNA fraction is a specific DNA segment** located on the *Agrobacterium Ti* plasmid. **Agrobacterium-mediated genetic transformation of plant cells** is a unique and complicated process by which genetic material is transported from the bacterium into the host nucleus, where it stably integrates. **In modern plant breeding, Agrobacterium is widely used for plant genetic engineering**. So, pair 2 is correctly matched.
- **Increasing β -carotene (a vitamin A precursor)** content in durum wheat grains is crucial not only for enhancing the nutritional quality of pasta but also as **a step toward food fortification to combat vitamin A deficiencies**. Studies in other species reveal that altering the expression of Lycopene epsilon cyclase (**LCYE**) genes redirects the metabolic flux toward the β - β branch, leading to higher accumulation of β -carotene. So, pair 3 is correctly matched.

So, all three of the above pairs are correctly matched.

Therefore, option (c) is the correct answer.



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Q42.

Answer: b

Explanation:

- The cultivation of millets can be traced back to the **Neolithic era**, approximately 10,000 years ago. Millets were among the earliest domesticated crops, alongside other staples like wheat, barley and rice.
- The literature on millets is scattered across various historical texts such as **Veda, Purana and Samhita**.
 - Historical sources reveal a rich diversity of millets in India, with **over 28 distinct species**. These include Balbaja, Kangu, **Priyangu, Shyamaka**, Kodrava, Nivara, Yavanala, Gavedhuka, Chinaka, Uddalaka, Charuka, Chanaka, Venuyava, Varuka, Varaka, Varattika, Todaparani, Madhulika, Nandimukhi, Nala, Nali, Mukunda, Sarabeejam, Shimbira, Nartaka, Prashatika, Ragi and Kuri.
 - Historical texts provide insights into millet cultivation techniques, traditional practices, and their importance in Indian diets.
- **Indus Valley region**, prominently featured millets in its agricultural practices and dietary habits.
- The **Kautilya's Arthashastra** also recognized millets as one of the primary crops cultivated during the Mauryan empire.

Therefore, option (b) is the correct answer.

Q43.

Answer: d

Explanation:

- In Sanskrit the term mudra means a seal, mark, sign or a currency. But in Buddhist context, it refers to **hand and arm gestures made during the course of ritual practice or** depicted in the images of Buddhas, Bodhisattvas, tantric deities and other Buddhist images.
- Mudras are commonly associated with visual depictions of Buddha (or Buddharupa), different gestures convey different meanings and moods, signifying the subtle manifestations of realization.
- In the earliest depictions four mudras can be found:
 - The Abhaya Mudra, meaning **“fearlessness,”** symbolizes **protection, reassurance** and peace. It signifies the Buddha's **compassion and his promise to protect his followers** from fear and danger. This gesture is depicted with one or both hands raised, fingers outstretched, and palms facing outward. It is associated with the Amoghasiddhi, one of the five wisdom Buddha, it conveys the Buddha's role as a pacifier and protector, promoting peace and harmony. **So, pair 1 is correctly matched.**
 - The Dharmachakra Mudra, or the **“Wheel of Dharma,”** represents the turning of the wheel of Buddhist teachings. It is associated with the **event of the Buddha's first sermon** at Sarnath, where he taught the Four Noble Truths. Depicted with the thumb and index finger of both hands forming circles, it symbolizes the **union of method and wisdom**. This mudra is linked to the wisdom Buddha Vairochana, emphasizing Buddha's role as a teacher. **So, pair 2 is correctly matched.**
 - The Bhumisparsha Mudra, meaning **“earth-touching gesture,”** symbolizes the **Buddha's enlightenment** under the Bodhi tree. It signifies the moment when Siddhartha Gautama invoked the **earth as a witness to his victory over** the demon of illusion. Depicted with the right hand touching the ground and the left resting on the lap, it represents steadfastness and the realization of truth. It is associated with the wisdom of Buddha Akshobhya. **So, pair 3 is correctly matched.**

- The Dhyana Mudra represents **meditation** and **concentration**, central to the path of enlightenment. It is performed with both hands resting on the lap, palms facing upward, with the right hand placed over the left. It is associated with the wisdom Buddha Amitabha, it emphasizes inner reflection and the pursuit of spiritual tranquility. **So, pair 4 is correctly matched.**

So, all four of the pairs given above are correctly matched.

Therefore, option (d) is the correct answer.

Relevance: In his first speech, the Leader of the Opposition in Lok Sabha referred to the abhaya mudra, a gesture with a raised open palm that symbolizes reassurance and freedom from fear.

Q44.

Answer: b

Explanation:

- The **Portuguese**, the first Europeans to come to India and incidentally were also the last to leave. The Portuguese affair on Indian soil began in 1498 CE when Vasco de Gama landed on the coast of Calicut.
- The Portuguese managed their Indian occupations through a hierarchy of officers:
 - **The head** of the Portuguese administration in India was the **viceroys** who served for three years, with his secretary and, in later years, a council.
 - Next in line was the **Vedor da Fazenda**, responsible for revenues, cargoes and dispatch of fleets.
 - The fortresses, from Africa to China, were under **captains**, assisted by **'factors'**, whose power was increased by the difficulties of communication and was too often used for personal ends.

Therefore, option (b) is the correct answer.

Q45.

Answer: a

Explanation:

- The **Allahabad-Kosam pillar**, located at Prayagraj, is one of the most historically significant inscriptions in India. The pillar serves as a testament to the **evolution of political power** in India, from the Mauryan to the Mughal period, reflecting the shifting **imperial ideologies** and how rulers sought to inscribe their legacy onto existing monuments.
- **Ashoka:** The earliest inscription found on the pillar is by **Emperor Ashoka Maurya**. It contains his **Edicts**, which promote Dhamma and highlight his policies. These inscriptions were part of Ashoka's widespread efforts to spread Buddhist principles across his empire after his **conversion to Buddhism**. Ashoka used the pillar to reinforce his governance based on moral and ethical conduct, encouraging peaceful co-existence and respect for all religions. This is a pivotal marker in the history of **Buddhism** and Mauryan governance. **So, point 2 is correct.**
- **Jahangir:** The Mughal Emperor **Jahangir** also added inscriptions to the pillar. These inscriptions are primarily **genealogical** and were added to commemorate his reign and the Mughal **dynastic glory**. Jahangir's inscriptions reflect his assertion of authority, his place in the **Mughal imperial lineage**, and the historical significance of the monument during his reign. The Mughal usage of ancient structures is part of a broader pattern where rulers sought to **link their authority** with past traditions. **So, point 5 is correct.**
- **Samudragupta:** Allahabad prashasti written by Harishena, court poet of Samudragupta, mentions about the military achievements of the Gupta king and his genealogy.
- **Skandagupta, Chandragupta and Firuz Shah Tughlaq:** **No inscriptions from these rulers** are present on this pillar. **So, points 1, 3 and 4 are not correct.**

So, only two of the above have their inscriptions on the Allahabad-Kosam pillar at Prayagraj.

Therefore, option (a) is the correct answer.

Q46.

Answer: b

Explanation:

- The Ajivikas **sect** was a **nastika** (the one who didn't believe in the infallibility of the vedas) philosophy during the ancient period. This philosophy emerged almost at the same time as **Buddhism** and **Jainism** in the Magadha region.
- It was a fatalist philosophy emphasizing on the concept of Niyati (**fate**), the Ajivikas doctrine that whatever happened or is going to happen is already predetermined and the humans cannot do anything to change it.
- The Ajivikas **rejected the concepts of free will and karma**, offering a unique philosophical perspective. Thus, emphasizing **absolute fatalism and determinism**—everything is preordained. **So, statement 1 is correct.**
- **Ashoka's edicts** record his patronage of the Ajivikas, including the donation of the **Barabar Caves** (e.g., Lomas Rishi and Sudama caves). These caves were used by Ajivika ascetics, reflecting their importance during his reign. **So, statement 2 is correct.**
- Unlike Buddhism and Jainism, the Ajivikas **rejected karma theory**, focusing instead on Niyati. They viewed karma as ineffective in altering predetermined outcomes. **So, statement 3 is not correct.**
- During their time, Ajivikas were a **notable rival** to both **Buddhism** and **Jainism**, as they shared similar ascetic and philosophical traditions but differed sharply in their doctrines.

So, only two of the statements given above are correct.

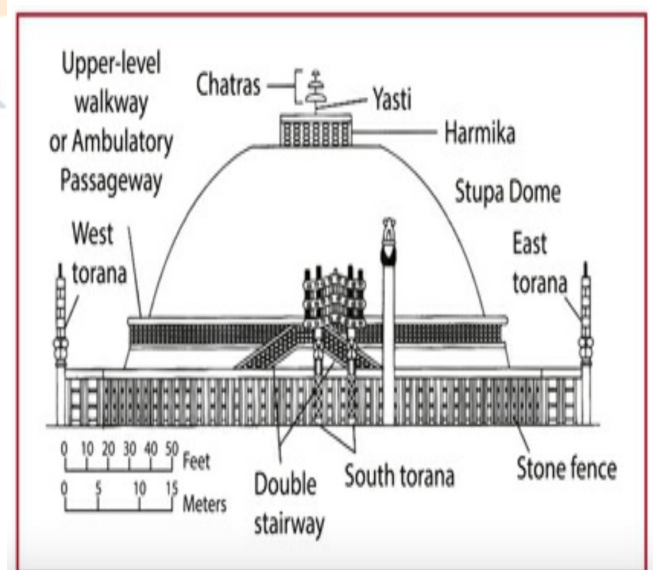
Therefore, option (b) is the correct answer.

Q47.

Answer: b

Explanation:

- **Stupas** were burial mounds prevalent in India from the Vedic period. But, stupas were popularised by the Buddhists.
- Stupa is a conventional representation of a funeral cumulus in which relics and ashes of the dead were kept. In Buddhism, a Stupa is a dome-shaped sacred monument containing relics of the Buddha or other sacred objects.
- In Buddhist architecture, **Yasti is the spire that rises from the apex of the dome of a stupa**. The yasti symbolizes the axis of the universe. It is enclosed by a harmika and adorned with chatras.
- In Buddhist architecture, **Harmika** is a square fence-like enclosure symbolizing heaven on top of the dome of a stupa. The harmika encloses the yasti with its chatras.
- **Medhi** refers to the platform on which the main structure of the stupa stands.
- **Torana** refers to a free-standing gateway marking the entrance to a Buddhist stupa.



Therefore, option (b) is the correct answer.

Q48.

Answer: b

Explanation:

- In the pre-modern and early modern Indian Society widow remarriage was a frowned upon topic and the widows were subjected to social ostracisation. Though the practice was prevalent amongst the lower castes of the society, in the upper caste groups the practice was absolutely prohibited.
- **Act XV, 1856** also known as the **Hindu Widows' Remarriage Act**, was specifically aimed at facilitating widow remarriage among hindus. It was enacted under the influence of social reformers like **Ishwar Chandra Vidyasagar**, who advocated for the rights of widows. The Act provided legal recognition to the remarriage of hindu widows and sought to remove social stigma associated with it. **So, point 1 is correct.**
- **Anand Marriage Act, 1909** was introduced to remove doubts as to the validity of the **marriage ceremony** common among the **Sikhs** called Anand karaj. It legitimized the Anand Karaj marriage ceremony, which is a Sikh religious marriage practice. It does **not explicitly address widow remarriage**. **So, point 2 is not correct.**
- **Brahmo Marriage Act, 1872** governed the **marriages of members of the Brahmo Samaj**, a reformist movement within Hinduism. It allowed **inter-caste and widow marriage**, but only if the contracting parties declared themselves to be non-Hindus. **So, point 3 is correct.**
- **Indian Christian Marriage Act, 1872** provided a legal framework for **Christian marriages in India**. It did **not have** any specific provisions related to **widow remarriage**. **So, point 4 is not correct.**

So, only two of the above facilitated widow remarriage in India.

Therefore, option (b) is the correct answer.

Q49.

Answer: d

Explanation:

- **Keshub Chandra Sen** was born in a modernist family. His grandfather Ram Kamal Sen was the first Indian Secretary of Asiatic Society, while his father was a student of Hindu College, Calcutta at the time when the Young Bengal movement was at its peak.
- **Keshab's primary concern was the quest for religion**, in this line he established the **Goodwill fraternity** in 1857. In one of its meetings he met Debendranath Tagore and got fascinated with monotheist **Vedantism** of Brahmo Samaj.
- He later became a prominent leader of the samaj bringing the element of radicalism into the movement, by attacking the caste system, focusing on women's rights, promoting widow remarriage and inter-caste marriages, and by raising the issue of caste status of the Brahmo preachers. This stream of radicalism led to schism between the followers of Brahmo Samaj.
- For Keshub's followers social progress and reform were above anything else, while the followers of Debendranath preferred to remain with the Hindu society.
- Finally the split took place with Keshub establishing the **Brahmo Samaj of India in 1866** and Tagore retaining the original Brahmo Samaj, which from now on started getting referred to as **Adi Brahmo Samaj**.

Therefore, option (d) is the correct answer.

Q50.

Answer: b

Explanation:

- Press was a major tool through which the Indian revolutionaries disseminated their philosophy, especially the militant nationalist and the extremist factions understood the potential of press to channelize their ideas amongst the masses. Some of the important journals of Indian revolutionaries were:
- The Indian Struggle (1920-42): It is a historical and political study by **Subash Chandra Bose**. Written in two parts, the book is a major analytical study of the freedom struggle from the non-cooperation movement to the Quit India movement and Mahatma Gandhi's critical role. **So, pair 1 is correctly matched.**
- Vishwa Prem (1924): It was an essay written by **Bhagat Singh** under the alias of Balwant Singh. It was published in a weekly edition of publication Matvala in 1924 at Calcutta. **So, pair 2 is not correctly matched.**
- Sandhya Patrika (1904): It was founded by **Brahma Bandhab Upadhyaya**, in which he criticised the British Government for the Partition of Bengal, for which he was charged with sedition. **So, pair 3 is correctly matched.**

So, only two of the pairs given above are correctly matched.

Therefore, option (b) is the correct answer.

Q51.

Answer: d

Explanation:

- **Financial Action Task Force (FATF)** is the global money laundering and terrorist financing watchdog. It sets international standards that aim **to prevent these illegal activities** and the harm they cause to society.
- It places member countries in any of the four categories, namely, 'regular follow-up,' 'enhanced follow-up,' 'grey list' and 'black list,' with the **regular follow-up being the topmost category among the four.**
- Only **5 countries in G20 including India** and 24 countries overall have been placed in regular follow up after the **Mutual evaluation report.**
 - Even developed countries like the US, Australia, Canada, New Zealand, Singapore, European nations such as Germany, Finland, Denmark etc are in '**Enhanced follow-up**'. It is given to countries **with significant deficiencies.**
- FATF has lauded India's **efforts to implement measures to tackle illicit finance including money laundering and terror funding.**
- A "regular follow-up" country has to submit its **progress report on the actions recommended by FATF** in a time-bound manner.
- FATF good ratings will lead to **better access to global financial markets** and increase **investor confidence.** It will also help in the **global expansion of the Unified Payments Interface (UPI),** India's fast payment system.

Therefore, option (d) is the correct answer.

Relevance: India joined the UK, France, Italy, and other G20 groups of countries that have been accorded the 'regular follow-up' category by the Financial Action Task Force (FATF).

Q52.

Answer: b

Explanation:

- **Minimum Support Price (MSP)** is the rate at which the government purchases crops from farmers. It serves as a “minimum price” that ensures farmers receive a **remunerative price for their produce**, even during periods of low market prices. It is designed to **safeguard farmers** against **price fluctuations** and market failures, thereby **ensuring a stable income**.
- MSP is announced for 22 mandated crops (14 kharif crops, 6 rabi crops, and 2 commercial crops), and the **fair and remunerative price (FRP) is determined separately for sugarcane**. Additionally, the MSP of toria and de-husked coconut is derived from rapeseed/mustard and copra, respectively.
- MSP is recommended by the **Commission for Agricultural Costs and Prices (CACP)**, an attached office of the Ministry of Agriculture and Farmers Welfare. The final decision is made by the **Cabinet Committee on Economic Affairs (CCEA)**, chaired by the Prime Minister, based on CACP’s recommendations.
- **The CACP considers the following productions costs while determining MSP:**
 - **A2 Costs:** These include all **direct paid-out costs borne by the farmer** in cash and kind for **inputs** such as seeds, fertilizers, pesticides, hired labour, leased-in land, fuel, irrigation, etc.
 - **A2+FL Costs:** In addition to A2, this includes the **imputed cost of unpaid family labour**, acknowledging the value of labour provided by family members who are not paid directly but contribute to the farming process. **So, statement 1 is not correct.**
 - **C2 Costs:** These are comprehensive costs that account for A2+FL along with **rentals and interest forgone on owned land and fixed capital assets**. **The CACP primarily uses A2+FL to determine MSP but considers C2 as a benchmark reference.**
- In 2018, the Indian government announced a policy to set MSPs at a level of **at least 1.5 times the A2+FL cost of production**, ensuring farmers receive a minimum of 50% returns over their production costs. **So, statement 2 is correct.**

Therefore, option (b) is the correct answer.

Knowledge Box

MSP formula by the Swaminathan Commission:

- The Swaminathan Commission recommended the C2+50% formula for MSP, which ensures farmers receive at least 50% more than their comprehensive production cost (C2).

Relevance: The Standing Committee of Parliament on Agriculture has recently recommended a legally guaranteed MSP for agricultural crops to prevent farmer suicides, promote rural economic growth, and ensure national food security.

Q53.

Answer: c

Explanation:

- **Blue bond** is a debt instrument that national governments, development banks, and corporations issue to raise funds for financing **marine and ocean-based projects** with positive economic and environmental benefits. Blue bonds are designed to support the realization of Sustainable Development Goals 6 and 14.
- **The International Finance Corporation (IFC)**, a member of the World Bank Group, together with the International Capital Market Association (ICMA), **United Nations Global Compact (UN Global Compact)**, **United Nations Environment Programme Finance Initiative (UNEP FI)**, and the

Asian Development Bank (ADB) have developed a global practitioner's guide for bonds to finance the sustainable blue economy.

- One of the limitations of blue bonds as a financial instrument is that **linking bonds to specific expenditures decreases the level of flexibility** that the beneficiary has in allocating the raised capital. This can lead to a situation where the company/sovereign can experience an overfunding or underfunding of its initiatives.

Therefore, option (c) is the correct answer.

Relevance: SEBI and Niti Aayog are developing guidelines for the development of the blue finance market in India.

Q54.

Answer: c

Explanation:

- According to the World Bank, **India was the topmost recipient of remittances in 2024** with an estimated inflow of \$129 billion. India is followed by Mexico, China, Philippines and Pakistan. **So, statement 1 is correct.**
- This is **driven by a recovery in the job markets in high-income countries**. The recovery of the job markets in the high-income countries of the Organization for Economic Co-operation and Development (OECD), following the onset of the pandemic, was the key driver of remittances. **So, statement 2 is correct.**
- Remittances have continued to outpace other types of external financial flows to low- and middle-income countries. It will continue to increase because of enormous migration pressures driven by demographic trends, income gaps, and climate change.
- The World Bank said that the gap between remittances and Foreign Direct Investment (FDI) is expected to widen further in 2024. In the past decade, remittances increased by 57 per cent, while FDI declined by 41 per cent, the World Bank said.
- The **UNCTAD World Investment Report 2024** highlights that global foreign direct investments (FDI) declined marginally by 2 per cent to USD 1.3 trillion in 2023 from USD 1.4 trillion in 2022. This declining trend was also seen in India. The decline in global FDI flows has also impacted FDI flows to India. **Net FDI inflows to India declined from USD 42.0 billion during FY23 to USD 26.5 billion in FY24.** The contraction in net inflows was primarily due to a surge in repatriation/disinvestment due to many profitable exits. **So, statement 3 is not correct.**

Therefore, option (c) is the correct answer.

Relevance: At \$129 bn, India top recipient of remittances this year: World Bank

Q55.

Answer: c

Explanation:

- According to the International Labour Organisation's **India Employment Report 2024**, India is at an **inflection point** in its demographic transition, where **the proportion of youths**, who constituted 27 per cent of the population in 2021, **is projected to decline to 25 per cent in 2031 and to 23 per cent in 2036.**
- Over the past two decades, India experienced continuous decline in its crude birth and death rates, resulting in its population growth rate reaching the lowest level since Independence.

- Between 2011 and 2021, the decadal growth rate was 12.5 per cent, with a projected decline to 8.4 per cent in the 2021–31 decade.
- Despite the decline, the proportion of **India's working-age population (aged 15–59) increased from 61 per cent in 2011 to 64 per cent in 2021** and is projected to reach 65 per cent in 2036, with projected stability thereafter.
- Although the proportion of youths in India's total population has started to decline, at 371 million persons, it still accounts for a considerably large population size when compared with most other countries and will remain significant for at least the next decade.
- Unlike **China, Japan and the United States**, which are today grappling with the challenges of an **ageing population**, India has the advantage of a sizable youth and working-age population.

Therefore, option (c) is the correct answer.

Knowledge Box

- **Population growth** is determined by births and deaths. Every country has seen very substantial changes in both: mortality and fertility rates have fallen across the world.
- The **total fertility rate** in a specific year is defined as the total number of children that would be born to each woman if she were to live to the end of her child-bearing years and give birth to children in alignment with the prevailing age-specific fertility rates.
- **Mortality Rate** is also known as a death rate, is a measure of the number of deaths in a population per unit of time, relative to the size of the population.



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Q56.

Answer: d

Explanation:

- **Foreign Direct Investment (FDI)** plays a significant role in India's economic growth, contributing to the development of various sectors. However, certain sectors require government approval due to national security, regulatory concerns, or their strategic importance. This regulation ensures that foreign investments align with India's broader economic and security objectives.
- **Telecom:** The **telecom** sector requires government approval for FDI above certain limits, as it is critical for national security. FDI is allowed up to 100% in some areas, but companies involved in sensitive services like defense, encryption, or **communication infrastructure require government clearance**. The government's concern is to ensure that foreign entities do not control critical communication networks. **So, point 1 is correct.**
- **Media:** The **media** sector, including **broadcasting** and **print media**, requires government approval for FDI due to its potential influence on public opinion and national security. The Indian government restricts foreign ownership in media companies, particularly in news and current affairs channels, to preserve domestic control over media content and editorial independence. **So, point 2 is correct.**
- **Pharmaceuticals:** The **pharmaceutical** sector requires approval for FDI in areas related to **critical drugs** and **healthcare** products. Foreign investments are carefully scrutinized to avoid monopoly control over essential medicines and ensure accessibility and pricing. The government restricts investment in certain segments like generic drugs to maintain local production capabilities. **So, point 3 is correct.**
- **Lotteries:** **Lotteries** and other forms of gambling fall under highly regulated sectors in India. **FDI in lotteries** is subject to government approval to ensure that foreign investments do not promote illegal activities or harm the social fabric. These sectors are also tightly controlled to prevent the exploitation of citizens through gambling. **So, point 4 is correct.**
- **Real Estate:** The **real estate** sector in India requires government approval for FDI, especially in **land development, construction, and urban projects**. The government regulates foreign investment in real estate to prevent speculation and ensure that investments contribute to infrastructure development rather than driving up land prices in sensitive regions. **So, point 5 is correct.**

Therefore, option (d) is the correct answer.

Q57.

Answer: c

Explanation:

- **Digital Bharat Nidhi (DBN)** is a fund established under Section 24(1) of the **Telecommunications Act, 2023**. It is the restructured version of the **Universal Service Obligation Fund (USOF)** created under the **Indian Telegraph Act, 1885**.
- In India, the New Telecom Policy 1999, provided that the resources for meeting the **Universal Service Obligation (USO)** would be raised through a '**Universal Access Levy**' (UAL), which would be a percentage of the revenue earned by the telecom operators under various licences. **So, statement 1 is correct.**
 - The **Indian Telegraph (Amendment) Act, 2003** giving statutory status to the Universal Service Obligation Fund (USOF), was passed by the parliament in December 2003. As per the Indian Telegraph Act 1885 (as amended in 2003 and 2006), the fund is to be utilised exclusively for meeting the Universal Service Obligation.

- As per 'The Telecommunications Act, 2023' the USO Fund, has become the DBN. The DBN has a mandate to support universal service through promoting access and delivery of telecommunication service in underserved **rural, remote and urban areas**. Its functions include **formulating and monitoring the implementation of USO Fund projects** and schemes. **So, statement 2 is correct.**
 - In order to achieve objectives of DBN, it covers various schemes and projects including **BharatNet, 4G Saturation Project, Provision of Mobile Service** in uncovered areas of Aspirational Districts, Mobile Services in Left Wing Extremist Areas, Mobile Services in Himalayan and Border areas, Mobile Services in Islands, Mobile Services in North Eastern Areas, etc.
- Digital Bharat Nidhi is administered by the **Administrator**, an official **appointed by the Department of Telecommunications (DoT)**, Ministry of Communications. The Administrator oversees its implementation and management under the **Telecommunications (Administration of Digital Bharat Nidhi) Rules, 2024**. Key responsibilities include formulating schemes, monitoring implementation, and ensuring funds are utilized for the above objectives. **So, statement 3 is not correct.**

Therefore, option (c) is the correct answer.

Knowledge Box

Key objectives of DBN includes:

- Extend mobile, broadband, and **telecommunication services** to underserved **rural, remote, and urban areas**.
- Develop secure **telecommunication infrastructure** and services.
- Increase **affordability and accessibility** of telecommunication services for economically weaker sections.
- Encourage **research, development, and commercialization** of indigenous telecom technologies and intellectual property.
- Foster the **growth of start-ups** in the telecommunications sector.
- **Bridge gaps** between **academia, research institutes, start-ups, and industry** to enhance capacity building and ecosystem development.
- Promote **green and sustainable technologies** in the telecommunications sector.
- Provide funding for technological solutions, **regulatory sandboxes**, and **risk mitigation measures** to enhance access to telecom services.

Relevance: Recently, the Department of Telecommunications (DoT) released the Telecommunications (Administration of Digital Bharat Nidhi) Rules, 2024, to operationalize the Digital Bharat Nidhi.

Q58.

Answer: d

Explanation:

- **The gravity model of international trade** is a model that predicts the volume of trade between two countries **based on their economic size and distance**.
- The gravity model of international trade predicts that the flow of goods between two locations is positively related to their economic size (or income levels) and negatively related to the distance between them.
- The gravity equation in international trade is one of the most robust empirical findings in economics. It says that **bilateral trade between two countries is proportional to their respective sizes measured by their GDP, and inversely proportional to the geographic distance between them**.
- Both the role of distance and economic size are remarkably stable over time.

- For example: If an exporting country doubles in GDP size, its aggregate exports double. Symmetrically, if an importing country doubles in GDP size, its aggregate imports double.

Therefore, option (d) is the correct answer.

Q59.

Answer: d

Explanation:

- The **Water (Prevention and Control of Pollution) Amendment Act, 2024**, introduces several changes to modernize the framework for water pollution control in India. The Act emphasizes efficiency, compliance, and streamlining regulatory processes, including decriminalization of minor offences, penalties, and enhanced governance measures.
- The Amendment Act focuses on **reducing the burden of litigation by decriminalizing certain minor offences**. Instead of imprisonment, offenders are now subject to **monetary penalties**, which range between ₹10,000 to ₹15 lakh depending on the severity of the violation. This aligns with the global trend of adopting a **punitive yet non-criminal approach to environmental violations**. So, statement 1 is correct.
- Under the amended provisions, the Central Government, in consultation with the **Central Pollution Control Board (CPCB)**, can **exempt specific industrial plants** or sectors from obtaining prior consent for discharge, provided they meet certain conditions. This aims to streamline processes for industries while maintaining environmental safeguards. So, statement 2 is correct.
- The Amendment Act enhances **central oversight** by allowing the Central Government to **prescribe criteria, tenure, and service conditions** for the Chairman and members of **State Pollution Control Boards (SPCBs)**. This change is aimed at ensuring uniformity and better governance across states. So, statement 3 is correct.

Therefore, option (d) is the correct answer.

Q60.

Answer: b

Explanation:

- The terms **DUET (Digitalization of Utilities for Energy Transition)** and **ENTICE 2.0 (Energy Transitions Innovation Challenge)** are associated with initiatives to accelerate **India's energy transition**. DUET focuses on the **digitalization of grid systems**, enabling real-time data tracking and optimizing grid operations to reduce transmission losses. ENTICE 2.0, launched by the **Global Energy Alliance for People and Planet (GEAPP)**, supports innovative energy solutions by providing funding and mentorship to startups. These initiatives aim to drive **sustainable growth and renewable energy adoption**.
- DUET aids in integrating **Battery Energy Storage Systems (BESS)** and Distributed Renewable Energy (DRE) into the grid, addressing key challenges in India's renewable energy sector. ENTICE 2.0 nurtures startups, fostering **scalable innovations** to meet India's clean energy targets, including the ambitious **500 GW renewable capacity goal**. Both initiatives reflect the emphasis on **technology and innovation** in achieving a sustainable and inclusive energy transition.

Therefore, option (b) is the correct answer.

Q61.

Answer: d

Explanation:

- The **Resin Identification Codes (RIC)** are a standardized system used to identify different types of plastics based on their polymer type and common uses. Each code corresponds to a specific type of plastic, aiding in sorting, recycling, and understanding the material's properties and applications. Accurate knowledge of these codes is essential for sustainable waste management and recycling efforts.
- **Polyethylene Terephthalate (PET)** is commonly used in **water and soda bottles, food containers**, and other transparent packaging due to its lightweight, strength, and recyclability. It is one of the most widely recycled plastics and is often repurposed into fibers, fabrics, and new containers. **So, pair 1 is correctly matched.**
- **High-Density Polyethylene (HDPE)** is durable, non-reactive, and resistant to chemicals, making it ideal for **shampoo bottles, milk jugs, and cleaning product bottles**. It is also used in other applications like plastic bags and bins. HDPE is recyclable and often repurposed into pipes and plastic lumber. **So, pair 2 is correctly matched.**
- **Polystyrene** is lightweight and easily moldable, used in **disposable coffee cups, takeaway food packaging, and plastic cutlery**. Expanded polystyrene, commonly known as Styrofoam, is popular for insulation and protective packaging. **So, pair 3 is correctly matched.**

Therefore, option (d) is the correct answer.

Q62.

Answer: d

Explanation:

- **Non-native species** are plants and animals living in areas where they do not naturally exist. They are introduced intentionally or unintentionally to an ecosystem.
- In general, invasive species harm both the natural resources in an ecosystem as well as threaten human use of these resources. They are capable of causing extinctions of native plants and animals, **reducing biodiversity**, competing with native organisms for limited resources, and altering habitats. This can result in **huge economic impacts and fundamental disruptions** of the host ecosystems. Examples include the unintentional introduction of the viruses and other pathogens, Lantana camara, Prosopis juliflora, African catfish, etc. **So, statement 2 is correct.**
- “Non-native species” and “invasive species” can not be used interchangeably. Many commonly grown fruits and vegetables are not native to an ecosystem but are considered to be **beneficial organisms**. For example, tomatoes, potatoes, wheat, and cotton are all domesticated non-native species that provide large benefits to humans. Many times, non-native species are intentionally introduced to control pests, as biocontrols. These biocontrols are beneficial to the host system. Thus, the non-native species are not always “invasive” in nature. **So, statement 1 is not correct.**

So, Statement-I is incorrect, but Statement-II is correct.

Therefore, option (d) is the correct answer.

Knowledge Box

Lantana camara:

- A 2020 study showed that the Lantana camara, a tropical American shrub, has invaded more than **40 per cent of India's tiger habitats**, threatening them through a causal chain that ultimately depletes the tiger's prey base.
- The shrub's presence was most prominent in the Shivalik hills, central India, and the southern Western Ghats.
- Notwithstanding its pretty flowers, which make the lantana an ornamental garden shrub, it is among the world's 10 worst invasive species and one of high concern in India.

Q63.

Answer: a

Explanation:

- **Wetlands** are often seen as useless lands and are at risk of being taken over or used for other purposes as cities expand. However, wetlands play a **critical role in controlling floods, cleaning water**, and providing numerous benefits to people.
- To protect these vital ecosystems and support sustainable urban growth, the **Ramsar Convention** introduced the **Wetland City Accreditation scheme**. It is a voluntary initiative under the Ramsar Convention (Resolutions XII.10, XVI.10). It recognizes and honours the cities displaying exceptional efforts in protecting and managing their urban wetlands. **So, statements 1 and 3 are not correct.**
- It provides international recognition to cities that **prioritize the conservation and sustainable use of their natural or human-made wetlands**. **So, statement 2 is correct.** This recognition highlights cities' efforts to protect wetlands and integrate their management into urban planning. The scheme not only enhances the global reputation of participating cities but also underscores the importance of wetlands in fostering environmental resilience.
- **The Accreditation scheme aims to:**
 - Promote the preservation and wise use of urban and peri-urban wetlands.
 - Foster positive interactions between urban areas and wetlands, especially those near Wetlands of International Importance.
 - Enhance understanding among citizens about the value of wetlands through education and participation in urban planning.
 - Deliver socio-economic benefits to local communities by preserving wetlands as vital urban ecosystems.
 - Serve as a model for other cities to adopt sustainable wetland management strategies.
- The Ministry of Environment, Forest and Climate Change (MoEF&CC) has nominated three Indian cities for the Wetland City Accreditation (WCA) under the Ramsar Convention on Wetlands. These cities are **Indore and Bhopal in Madhya Pradesh, and Udaipur in Rajasthan**. This is the first time Indian cities have been proposed for this recognition.
- **China has the most Wetland City Accreditation** in the world.

So, only one of the statements given above is correct.

Therefore, option (a) is the correct answer.

Knowledge Box

- **According to the Ramsar Convention, a wetland is defined** as ‘areas of marsh, fen, peatland, or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish, or salt, including areas of marine water the depth of which at low tides does not exceed six meters.’
- Additionally, **under Article 2.1 of the convention**, wetlands may also include riparian and coastal zones adjacent to wetlands, as well as islands or bodies of marine water deeper than six meters at low tide that lie within the wetlands.
- **Facts about wetlands in India**
 - India’s Ramsar wetlands comprise around 10% of the total wetland area in the country across 18 states.
 - Total there are 85 wetlands in India.

Relevance: Ministry of Environment, Forest, and Climate Change submits proposals for Wetland City Accreditation under the Ramsar Convention on Wetlands for cities of Indore, Bhopal and Udaipur

Q64.

Answer: a

Explanation:

- **Pink fire retardants**, such as **Phos-Chek**, are commonly used in wildfire control to slow down the spread of fires. The primary **component** in these retardants is **ammonium phosphate**, a compound that helps prevent the ignition of vegetation by depriving it of oxygen. This mixture is highly effective because it **does not evaporate easily**, allowing it to coat vegetation for a longer period, ensuring continued protection. The **color** is added to the retardant for **visibility**, helping firefighters create fire lines. However, environmental concerns have been raised about the presence of **toxic metals**, such as **chromium and cadmium**, in the retardant, which can harm aquatic life when the retardant enters rivers and streams. Despite its widespread use, there are debates about the **effectiveness** of these retardants, particularly in the face of increasing **climate change** and **wildfire intensity**.

Therefore, option (a) is the correct answer.

Q65.

Answer: a

Explanation:

- **Sirenia**, the only order of marine mammals in India other than the Cetacea, has just four species in two families worldwide. The term **sea cow** is now sometimes used to refer collectively to sirenians. All the four species of these two families have become rare due to human exploitation for meat and oil.
- The two families are the Dugongidae, the **dugong family**, and the Trichechidae, or the **manatee family**. **So, points 2 and 3 are not correct.**
- **Steller’s Sea-cow**, a large species belonging to this order, **was wiped out of existence within years of its discovery** in the 18th century. **So, point 1 is correct.**
- The three species of **manatee** occupy warm latitudes of the coastal Atlantic and associated rivers, and the **dugongs** inhabit the coastlines of the Indian and Pacific oceans.
- **Steller’s sea cow was the largest sirenian** and one of the few sirenians to occupy cold water.
- All the sirenians are **completely herbivorous** and are confined to shallow waters of coastal areas where higher aquatic plant life is abundant.

- **Dugongs are strictly marine mammals whilst manatees may live in the sea or in estuarine or riverine waters.**

So, only one of the above species is extinct.

Therefore, option (a) is the correct answer.

Q66.

Answer: c

Explanation:

- The recent **Annual Ground Water Quality Report, 2024** indicates high concentrations of nitrate, fluoride, arsenic, and iron in groundwater. Almost 20% of the samples exceeded the permissible limit for nitrate, while 9.04% of samples had fluoride levels above the limit. Arsenic contamination was found in 3.55% of samples.
- The report indicates that the **monsoon season showed some improvement in water quality**, particularly in areas affected by high electrical conductivity (EC) and Fluoride. Post-monsoon, a modest reduction in EC levels and Fluoride was observed in some regions, indicating that **monsoon recharge can temporarily improve water quality by diluting salts**. Monsoon rains generally help dilute salts and improve groundwater quality in many regions. **So, statement 1 is correct.**
- The monsoon precipitation appears to have a dual effect on groundwater quality. While **it may help dilute nitrate concentrations in some areas**, it leads to a higher leaching of contaminants from the surface to the groundwater, **worsening the situation in other locations**. The recent report says that monsoon rains can **lead to the rise in nitrate levels** which may be primarily attributed to agricultural runoff. **Following the monsoon season nitrate concentration often increases** due to surface runoff from agriculture fields. During heavy rain fertilizers and other contaminants can wash into aquifers elevating nitrate level. **So, statement 2 is not correct.**

So, Statement-I is correct, but Statement-II is incorrect.

Therefore, option (c) is the correct answer.

Relevance: The Union Government has recently released the Annual Ground Water Quality Report for the Year 2024.

Q67.

Answer: c

Explanation:

- **Urban Mining** refers to the process of **extracting valuable materials**, including critical minerals, from discarded **electronic waste (e-waste)**. It plays a pivotal role in fostering a **circular economy** by recycling resources that are otherwise difficult to source sustainably.
- It focuses on recovering valuable raw materials like **lithium, cobalt, copper, nickel, rare earth elements**, and precious metals (gold, silver, platinum) from discarded e-waste.
- **Relevance in India:**
 - **India** is the **third-largest producer of e-waste globally**, with significant potential for critical mineral recovery.
 - E-waste includes components from **EV batteries, solar panels, wind turbines**, and high-tech electronics like laptops and mobile phones.

Therefore, option (c) is the correct answer.

Relevance: The Ministry of Mines is designing a Production Linked Incentive (PLI) scheme to promote the recycling of critical minerals in India.

Q68.

Answer: a

Explanation:

- **Herons** are considered important ecological **wetland health indicators** because they are highly sensitive to environmental changes, including habitat loss, prey availability, and water quality. Their population trends reflect the overall health of wetland ecosystems. **So, statement 1 is correct.**
- Herons occupy a **high trophic level in the aquatic food chain**, feeding on fish and other aquatic organisms. This position makes them susceptible to **bioaccumulation** (build-up of toxic substances in their tissues) and **biomagnification** (increased concentration of toxins at higher trophic levels). These processes highlight their vulnerability to environmental contamination, making them effective indicators of ecosystem health. Thus, herons are important **indicators for toxic pollutants present in the ecosystem.** **So, statement 2 is correct.**

So, both Both Statement–I and Statement–II are correct and Statement–II explains Statement–I. Therefore, option (a) is the correct answer.



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Q69.

Answer: b

Explanation:

- The **Nuclear Triad of India** is a three-sided military-force structure consisting of **land-based** nuclear missiles, nuclear-missile-armed **submarines (sea based)** and **strategic aircraft (air based)** with nuclear bombs and missiles. The theory underlying the triad is that spreading the country's extensive nuclear arsenals across various weapons platforms and dimensions would provide a Credible Minimum Deterrence (CMD). **In 2018, with the deployment of INS Arihant, a Strategic Strike Nuclear Submarine, India got its fully operational Nuclear Triad.**
 - **Land-based Component:** It mainly includes missiles that can be launched from land-based platforms such as ICBMs (Inter-continental Ballistic Missiles), SRBMs (Short Range Ballistic Missiles), etc. The ICBMs are quite responsive and lethal. ICBMs are deployed in hundreds of silos and can be launched and reach targets within minutes, creating a nearly insurmountable targeting problem for adversaries. For example, **the Agni-V missile** can go up to a range of 5500 Km with nuclear warheads. Other land-based missiles that can support the triad are **Prithvi, Akash, Trishul**, etc.
 - **Sea-based Component:** This component majorly includes the Ship Submersible Ballistic Nuclear Submarines (SSBNs). The SSBNs are considered survivable because a portion of the SSBN fleet is always on patrol, making it very difficult for potential adversaries to track all of them, contributing to their survivability. For example, **INS Arihant with K-15 Sagarika missiles (700 Kms range) and K-4 (3500 Kms range) missiles.**
 - **Air-based Component:** It majorly includes the Bombers which are considered as flexible for attacking. The bomber aircraft are flexible and can resolve during a crisis and provide a variety of deployment and yield options when placed on alert. The aircraft that would work as bombers include the **Sukhoi Su-30MKI, Mirage 2000H, SEPECAT Jaguar, and most importantly Rafale.**

Therefore, option (b) is the correct answer.

Q70.

Answer: d

Explanation:

- **Organs-on-chips (OoCs)** are systems containing engineered or natural miniature tissues grown inside microfluidic chips. **To better mimic human physiology**, the chips are designed to control cell microenvironments and maintain tissue-specific functions. Combining advances in **tissue engineering and microfabrication**, OoCs have gained interest as a next-generation experimental platform to investigate human pathophysiology and the effect of therapeutics in the body. **So, statement 1 is correct.**
- The OoCs need to be manufactured using a material which does not influence the cellular microenvironment components and maintain a stable fluid connection.
- **Polydimethylsiloxane (PDMS)** is the simplest member of the silicone polymer family. It is the **most popular material used in OoCs. So, statement 2 is correct.**
- Traditional drug development is slow and expensive because animal models often do not accurately reflect human physiology, meaning that drugs that appear to be safe and effective in animals frequently turn out to be harmful or ineffective in humans. Since OoC devices can replicate key aspects of human physiology these **can accurately be used in drug discovery for personalized medicine. So, statement 3 is correct.**

Therefore, option (d) is the correct answer.

Relevance: China recently released a standard for skin-on-a-chip technology, the first national standard in the field of organ-on-a-chip technology.

Q71.

Answer: c

Explanation:

- **End-to-End Encryption (E2EE)** is a **data security mechanism** that ensures only the **sender and intended recipient** can access transmitted information.
- E2EE encrypts data before it leaves the sender's device and decrypts it only on the recipient's device. Any third party, even intermediaries like **cloud service providers or internet service providers** cannot decrypt the transmitted data. This ensures **confidentiality** during data transmission. **So, statement 1 is correct.**
- E2EE encrypts data on the sender's device and keeps it encrypted until the intended recipient decrypts it. This means that E2EE encrypts data **both while it's moving between endpoints and while it's stored on cloud servers.** **So, statement 2 is not correct.**

So, Statement-I is correct, but Statement-II is incorrect.

Therefore, option (c) is the correct answer.

Q72.

Answer: b

Explanation:

- The **All India Federation** was a concept discussed during the colonial period in India, primarily involving **British India** and the **Princely States**. It was proposed as a way to integrate the princely states into a unified constitutional framework, giving them a role in the governance of India while maintaining British control.
- The **Indian States Committee** popularly known as the **Butler Committee**, which was formed in 1927 to look into the **question of Paramountcy** and British relations with the Indian States, promised the Princes that paramountcy will not be transferred in any form to any Democratically elected government in India without the consent of the Princes. At the same time, **it reaffirmed the unlimited supremacy of Paramountcy.** It made **no recommendations for the creation of an All India Federation.** **So, statement 1 is not correct.**
- Concerned for this unlimited extent of paramountcy the Princes found the idea of federation, first proposed in **Nehru Report of 1928** (it should be noted that federation in Nehru report had no explicit mention of Indian states joining it), an ideal way to escape the 'shackles of paramountcy' at the same time safeguarding their internal autonomy of action.
- In the **First Round Table Conference (RTC)** the representatives of Princely States in India agreed on the **idea of Federation, moved ahead by Tej Bahadur Saprū.** But this enthusiasm got waned off by the Second RTC, where Princes were divided on the issue of federation.
- Ultimately, the Princes agreed on a mutual agreement – known as the **'Delhi Pact'** – projecting federation as a constitutional demand of the Princes of India. **So, statement 2 is correct.**

Therefore, option (b) is the correct answer.

Q73.

Answer: b

Explanation:

- **M.C. Rajah** (17 June 1883-20 August 1943) was a Dalit politician and social and political activist from Tamil Nadu.

- Born to a poor family in Madras, he entered politics after graduating from college and became a leader of Paraiyars (a Scheduled Castes community) in the Justice Party. But he left the party in 1923 over the treatment of Dalits and allied with Dr. BR Ambedkar.
- MC Rajah formed the **All India Depressed Classes Association** in 1926 at Nagpur, with him as President and Dr. Ambedkar as Secretary. It must be noted here that Ambedkar formed his own association three years later naming it as **All India Depressed Classes Congress**. So, statement 1 is correct.
- **Rajah**, along with Ambedkar and Rettamalai Srinivasan, **represented the Dalits at the Second Round Table Conference (1931)** in London. So, statement 2 is correct.
- During late 1935, Rajah **chose to not support Ambedkar's decision to leave Hinduism**. Rajah, felt that conversion from Hinduism would weaken the determination of the Dalit and Hindu social reformers involved in fighting caste anomalies. In the same line he **opposed the proposition of separate electorates for Dalits**. So, statement 3 is not correct.
- He, as a president of the All India Depressed Classes Association, signed an agreement with the Hindu Mahasabha, then led by BS Munje, for proposing joint electorates, popularly known as **the Rajah-Munje pact**. It was a precursor of the Poona Pact, signed between Gandhi and Ambedkar.

So, only two of the statements given above are correct.

Therefore, option (b) is the correct answer

Q74.

Answer: c

Explanation:

- **Mount Girnar**, located in **Gujarat, India**, is primarily composed of igneous rocks formed during volcanic activity associated with the Deccan Traps. While not an active volcano, it was formed as part of **ancient volcanic processes** millions of years ago. Its basaltic composition and **connection to the Deccan volcanic events** confirm its volcanic origin. So, point 1 is correct.
- **Tosham Hills in Haryana** were formed by **volcanic activity around 732 million years ago**. This is part of the Aravalli Mountain range in western-southern Haryana. It has igneous rock formations. They are classified as **extinct**, and there is no present volcanic activity. So, point 2 is correct.
- **Lake Lonar**, located in the Buldhana district of **Maharashtra**, is a unique and mysterious natural wonder. It is the only known **saline crater lake** in the world. It was **formed by the impact of a meteorite** about 50,000 years ago. It was **once thought to be volcanic in origin** due to its location in this basalt field. So, point 3 is not correct.
- **Barren Island**, located in the **Andaman Sea**, is **India's only active volcano**. It frequently erupts due to its location on the Indo-Australian and Eurasian plate subduction zone. Its first volcanic eruption outbreak was witnessed in 1787. Since then, the volcano has erupted more than 10 times, with the most recent one being in 2020. So, point 4 is correct.

So, only three of the above are of volcanic origin.

Therefore, option (c) is the correct answer.

Q75.

Answer: c

Explanation:

- **The International Date Line (IDL)** is an invisible boundary that runs through the Pacific Ocean, roughly along the 180-degree longitude. It serves as the line where the calendar date changes.

- Moving west across the IDL advances the date by one day.
- Moving east sets the date back by a day.
- **The chronological order of New Year celebrations depends on the time zones of the cities.** Each city experiences the New Year in accordance with the midnight local time.
 - In this line the country located to the nearest west of the IDL will be celebrating new year eve the earliest.
- **The first country to celebrate New Year's Eve annually is the Oceanic country Kiribati—the island of Kiritimati to be precise.** Kiribati is an island country, made up of more than 30 islands and atolls spread over hundreds of miles, and the International Date Line actually loops eastward around the country's easternmost islands (including Kiritimati) in order to keep them all in the same day (otherwise the country's eastern islands would be up to 24 hours behind the western islands). Kiribati is also the only country to have territory in all four hemispheres.
- The cities and countries of Chatham Islands, New Zealand; Petropavlovsk-Kamchatsky, Russia; and Sydney, Australia celebrate the new year shortly after Kiribati.



Therefore, option (c) is the correct answer.

Q76.

Answer: d

Explanation:

- **The judicial powers and functions of the Governor of a State are:**
 - S/he is consulted by the President while appointing the Judges of the concerned State High Court. **So, statement 1 is correct.**
 - S/he makes appointments, postings and promotions of the district judges and persons to the judicial service of the State (other than district judges) in consultation with the State High Court. **So, statement 2 is correct.**
 - Further, in 2022, the Chhattisgarh High Court held that the High Courts cannot **terminate the services of a District Judge** or impose any punishment of reduction in rank. This power belongs to the **Governor** being the appointing authority under Article 311(I) of the Constitution. **So, statement 3 is correct.**

- Also, s/he can grant pardons, reprieves, respites and remissions of punishment or suspend, remit and commute the sentence of any person convicted of any offence against any law relating to a matter to which the executive power of the State extends.

Therefore, option (d) is the correct answer.

Q77.

Answer: a

Explanation:

- The **Anti-Defection Law, added as the Tenth Schedule** to the Constitution of India, outlines specific scenarios where a legislator can be disqualified for defecting.
- A member of a House belonging to any political party becomes **disqualified** from being a member:
 - if s/he **voluntarily gives up his membership** of such a political party;
 - An **independent member of a House** becomes disqualified from remaining a member of the House if he joins any political party after such an election.
 - A **nominated member of a House** becomes disqualified for being a member of the House if he joins any political party after the expiry of six months from the date he takes his seat in the House.
 - If a legislator is **absent or abstains from voting** in the House after a party whip is issued, without prior permission, it may lead to disqualification under the Anti-Defection Law. **So, point 3 is correct.**
- The Anti-Defection Law **does not apply** in **Rajya Sabha elections** because whips are generally not enforced, and elections are conducted by the Election Commission outside the House. **So, point 1 is not correct.**
- The Anti defection law also **does not apply** to the Presidential election. **So, point 2 is not correct.**

So, only one of the above instances can lead to disqualification of a Member of Parliament based on Anti-Defection Law.

Therefore, option (a) is the correct answer.

Knowledge Box

Exceptions to the Anti-Defection Law:

- The disqualification on the ground of defection does not apply in the following two cases:
 - **Merger:** If a member goes out of his party due to a merger of the party with another party. A merger takes place when two-thirds of the members of the party have agreed to such a merger.
 - **Presiding Officer:** If a member, after being elected as the presiding officer of the House, voluntarily gives up the membership of his party or rejoins it after he ceases to hold that office. This exemption has been provided in view of the dignity and impartiality of this office.

Q78.

Answer: b

Explanation:

- The **Representation of the People Act, 1950** makes provisions for preparation of electoral rolls for parliamentary and assembly constituencies. Section 21 of this act says that “The electoral roll for each constituency shall be prepared in the prescribed manner by reference to the qualifying date and shall come into force immediately upon its final publication in accordance with the rules made under this Act.” **So, option (a) is correct.**

- Electoral Rolls are prepared under the superintendence, direction and control of the Election Commission of India.
- There are 3 categories of electors in India: –(i) General electors (ii) Overseas (NRI) electors , and (iii) Service Electors.
- In India though the minimum age of voting is 18, persons who have attained **the age of 17 can apply in advance for having their names enrolled in the voter list**. A person does not necessarily have to await the prerequisite criterion of attaining age of 18 years on 1st January of a year. **So, option (b) is not correct.**
- With four qualifying dates i.e. 1st January, 1st April, 1st July and 1st October, the **electoral roll are updated every quarter** and eligible youngsters can be registered in the next quarter of the year in which he/she has attained the qualifying age of 18 years. **So, option (c) is correct.**
- **An overseas elector** is a person who is a citizen of India and who is absent from his place of ordinary residence in India owing to his employment, education or otherwise.
- According to the provisions of Section 20A of the Representation of People Act of 1950, **a person who is a citizen of India and who has not acquired the citizenship of any other country** and is otherwise eligible to be registered as a voter **and who is absenting from his place of ordinary residence in India** owing to his employment, education or otherwise **is eligible to be registered as a voter** in the constituency of residence as mentioned in his passport. **So, option (d) is correct.**

Therefore, option (b) is the correct answer.

Q79.

Answer: a

Explanation:

- **The United Nations (UN) recognizes six official languages**, which are used in its deliberations, documentation, and communications to ensure inclusivity and effective global representation. These six languages are:
 - **English**
 - **French. So, point 3 is correct.**
 - **Spanish. So, point 1 is correct.**
 - **Arabic. So, point 2 is correct.**
 - **Russian**
 - **Chinese. So, point 6 is correct.**
- In 2022, the United Nations General Assembly (UNGA) had adopted a resolution on multilingualism that mentions three major languages of the subcontinent—**Hindi**, Urdu and Bengali—for the first time. It encourages the UN to continue disseminating important communications and messages in official as well as in **non-official languages. So, points 4 and 5 are not correct.**

Therefore, option (a) is the correct answer.

Q80.

Answer: a

Explanation:

- **GovDrive is a cloud-based multi-tenant platform that allows government officials to share documents.** The service can be integrated with multiple government applications to provide a centralized storage solution and enable collaboration amongst government officials.

- With extensive features such as storing and syncing documents, comprehensive search, encryption, etc., GovDrive also supports synchronizing documents uploaded across various devices.

Therefore, option (a) is the correct answer.

Relevance: The Ministry of Electronics and Information Technology is upgrading the Bhashini platform with AI-driven multilingual support for seamless voice and text interactions.

Q81.

Answer: b

Explanation:

- The term **Shad-gunya** originates from **Kautilya's** Arthashastra, which was a treatise on statecraft, strategy, and economics written during the Mauryan Empire. It refers to the **six-fold policies** a king should adopt to deal with neighboring states based on the circumstances and strategic interests.
- These six policies are:
- Sandhi (**peace**): Forming alliances to avoid war.
- Vighraha (**war**): Resorting to warfare when it benefits the state.
- Asana (**neutrality**): Maintaining a neutral stance during conflicts.
- Yana (**preparation for war**): Mobilizing resources and armies for a potential conflict.
- Samsraya (**seeking protection**): Aligning with a more powerful state for security.
- Dvaidhibhava (**duplicity**): Employing a combination of tactics, such as forming an alliance while preparing for war.

Knowledge Box

- The Shadgunya **theory** forms the basis for the popular treatise of Sham (**conciliation**), Daam (**economic incentives**), Dand (**punishment**), and Bhed (**division**). These approaches focus on achieving **political and military goals** using diplomatic, economic, punitive, or divisive strategies. They align with Kautilya's emphasis on **pragmatism and adaptability** in governance and diplomacy. The principles reflect the **realpolitik** approach adopted by the Mauryan rulers, ensuring survival and dominance in a competitive geopolitical environment.

Therefore, option (b) is the correct answer.

Q82.

Answer: a

Explanation:

- **Kumbh mela** is a periodical mass gathering of devotees belonging to the Hindu religion. 'Kumbh' literally means pitcher. As per the Hindu belief and school of astronomy the periodicity of Kumbh aligns with celestial alignments and is dependent on the revolution of Jupiter.
- The Kumbh is a **four yearly event rotating** between four holy locations in India: **Prayagraj** (Confluence of the Ganga, Yamuna, and the mythical Saraswati rivers), **Haridwar** (banks of the Ganga river), **Ujjain** (bank of the Shipra River), **Nashik** (bank of the Godavari River). **So, statement 1 is not correct.**
- The Kumbh mela is recognized as **one of the Intangible heritage of mankind by UNESCO**. **So, statement 2 is correct.**
- There are three types of Kumbh mela celebrated across the country – the Maha Kumbh, the Kumbh and the Ardha Kumbh.
 - The **Maha Kumbh** is the grand festival taking place once **every twelve years** exclusively at Prayagraj on the banks of Ganga.

- The **Ardha Kumbha** is a six-yearly event taking place at Prayagraj and Haridwar. **So, statement 3 is not correct.**
- The Maha Kumbh in 2025 is particularly special because it aligns with celestial configurations that occur once in 144 years, making it an extraordinary event for devotees and spiritual seekers.

So, only one of the above statements is correct.

Therefore, option (a) is the correct answer.

Q83.

Answer: b

Explanation:

- Since July 2024, **Bangladesh** has been engulfed in social, economic and political chaos, marked by widespread protests, violence, and state repression. This unrest culminated in the **dramatic resignation of former Prime Minister Sheikh Hasina**, who fled to Delhi, finding temporary refuge. Meanwhile, Nobel Laureate Professor Mohammad Yunus has taken on the role of leading the interim government, under the promise of preserving democracy and holding fresh elections. While the military played a crucial role in the resignation of Sheikh Hasina, it is **not a coup d'état** per se. **So, pair 1 is not correctly matched.**
- On December 8, 2024, the **Bashar al-Assad** (Former President) regime fell following a ten-day offensive carried out by rebel forces, beginning with the rebels' seizure of Aleppo. The armed coalition was led by Islamist militant group **Hayat Tahrir al-Sham (HTS)** and the **Turkish-backed Syrian National Army (SNA)**. The upheaval put an end to over fifty years of the Assad family's rule of Syria and four years of largely frozen dynamics in the Syrian civil war, which has been ongoing since 2011. **So, pair 2 is correctly matched.**
- South Korea witnessed a **political crisis recently**, when its President Yoon Suk Yeol declared **martial law**, which had never happened since the country became a democracy in 1987. Yoon said he was protecting the country from "anti-state" forces that sympathised with North Korea - but it soon became clear that he was spurred by his own political troubles. Consequently, Yoon Suk Yeol was **impeached and later got arrested** over the martial law declaration. **So, pair 3 is correctly matched.**

So, only two of the above given pairs are correctly matched.

Therefore, option (b) is the correct answer.



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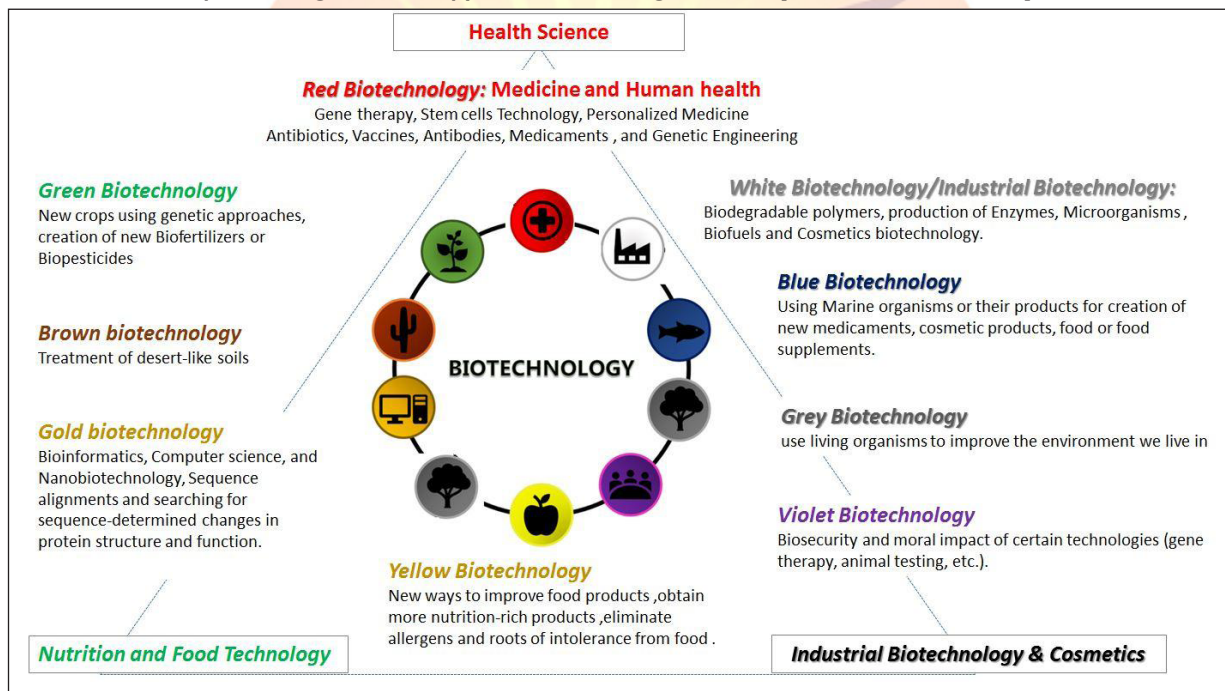


Q84.

Answer: d

Explanation:

- **Biotechnology** is a fusion between the fields of biology and technology aimed at providing innovative solutions to problems across different sectors. Depending on the area of study, biotechnology can be classified into different types: red, white, blue, purple, or green, among others.
- **Grey Biotechnology:** It aims at the **conservation and recovery of contaminated natural ecosystems** through a process known as **bioremediation**, which uses fungi, microorganisms, plants, or enzymes to restore contaminated environments. **So, pair 1 is correctly matched.**
- **Golden Biotechnology:** It is also known as **bioinformatics**. It is concerned with obtaining, storing, analyzing, and separating biological information, **mostly related to DNA sequence and protein structures**. **So, pair 2 is correctly matched.**
- **White Biotechnology:** It is also known as **industrial biotechnology**, it deals with research and manufacture of several useful materials including the **biodegradable polymers**. **So, pair 3 is correctly matched.**
- **Violet Biotechnology:** It deals with the **ethical and moral aspects of the biotechnology** as a whole such as moral impacts of gene therapy, animal testing etc. **So, pair 4 is correctly matched.**



So, all four of the above pairs are correctly matched.

Therefore, option (d) is the correct answer.

Q85.

Answer: b

Explanation:

- The **Reserve Bank of India (RBI)** introduced **MuleHunter.AI** as a tool to combat the rising cases of **mule account fraud** in the country. These types of fraud often involve criminals using **legitimate bank accounts** to transfer illicit funds, creating significant security risks in the financial system.
- By leveraging **AI technology**, MuleHunter.AI detects **suspicious patterns** and unusual behavior in bank accounts, enabling banks to take **preventive action** faster.

- This initiative aims to improve the **detection efficiency** of such financial crimes, providing a more **secure environment** for both banks and customers.
- In collaboration with **fintech institutions** and the **Institute for Development and Research in Banking Technology (IDRBT)**, the RBI developed advanced **algorithms** to identify these mule accounts. The **pilot tests** with major public sector banks have shown promising results, demonstrating the effectiveness of the AI in spotting **irregularities** in real-time. The tool uses **19 distinct behavioral patterns** to identify accounts involved in illicit activities.

Therefore, option (b) is the correct answer.

Q86.

Answer: b

Explanation:

- **Credit mix** is a term used to describe the **different types of credit accounts** a person has. These include car loans, credit cards, student loans, personal loans, among others. It measures how well-diversified the credit profile of a person is.
- Having a mix of different types of credit can have a positive impact on the credit score. Having a diverse mix of credit accounts shows lenders that one can handle different types of credit in a responsible fashion. **Credit mix is one of the factors that affects the credit score.**
- The **Credit Utilization Ratio** is the **percentage of a borrower's total available credit that is currently being used.**

Therefore, option (b) is the correct answer.

Q87.

Answer: b

Explanation:

- **Derivatives** are financial instruments whose **value is derived from an underlying asset or a group of assets**. These assets can be stocks, bonds, commodities, currencies, interest rates, or market indices. Various types of derivatives include **futures, options, swaps, and forwards**.
- **Futures** are derivative contracts that obligate the parties involved to buy or sell an asset at a predetermined price on a future date. **So, point 1 is correct.**
 - Futures contracts are traded on various underlying assets like stocks, indices, commodities, and currencies. Traders and investors use derivatives to speculate on the future direction of prices in the underlying assets.
- **Participatory Notes or P-notes are Offshore Derivative Instruments (ODIs).** It is issued by registered Foreign Portfolio Investors (**FPIs**) to overseas investors who wish to be a part of the Indian stock markets without registering themselves directly. P-notes have Indian stocks as their underlying assets. **So, point 2 is correct.**
- These are financial instruments used by investors and hedge funds to invest in Indian securities, without registering with the Security and Exchange Board of India (SEBI).
- **Options are one category of derivatives** that give the holder the right, but not the obligation, to buy or sell the underlying asset. They come with a strike price (the agreed buying or selling price) and an expiration date, after which the option is no longer valid.
 - **Call Options:** Give the buyer the right to purchase an asset at a specified price within a particular time frame.

- **Put Options:** Grant the holder the right to sell an underlying asset at a predetermined price.
- **Swaps** involve the exchange of cash flows or assets between two parties. It is a **derivative contract** where one party will exchange the value of an asset or cash flows with another. Swaps are widely used for hedging against various risks like interest rates, currency, commodity prices, and credit risks. Type of Swaps: **Interest Rate Swaps, Currency Swaps, Commodity Swaps, Credit Default Swaps.**
 - **Credit Default Swaps:** These are **financial derivatives that transfer credit risk between two parties.** The buyer of the swap pays a premium to the seller and receives protection in case of a credit event, like a default, on the underlying asset. **So, point 4 is correct.**
- **Forward contracts** are derivatives that involve an agreement between two parties to buy or sell an asset at a specified price (the forward price) on a future date. Participants use forward contracts to hedge against future price fluctuations of assets, thereby managing risk.
- **A “Promissory note” is a debt instrument, and not a derivative instrument.** It is an instrument in writing containing an unconditional undertaking to pay a certain sum of money to a certain person. It acts like a financial instrument which forms a binding contract by law between the borrowers and the lenders. **So, point 3 is not correct.**
- **Commercial Paper (CP) is a short-term debt instrument, not a derivative instrument.** It is an unsecured money market instrument. Corporates, primary dealers (PDs) and all-India financial institutions (FIs) can raise short-term funds by issuing CP. It is issued at a discount to face value, and redeemable at par to the holder at maturity. **So, point 5 is not correct.**

So, only three of the above are derivative instruments.

Therefore, option (b) is the correct answer.

Knowledge Box

Other Derivative Instruments:

- **Credit derivatives:** These are financial instruments whose value is derived from the credit risk of an underlying asset, typically a bond or a loan. Credit derivatives hedge against credit risk in investment portfolios.
- **Weather derivatives:** These are financial instruments whose value is linked to specific weather conditions. They enable businesses or individuals to hedge against the risk of financial losses caused by variations in weather patterns.
- **Currency derivatives:** These are financial contracts whose value is derived from the exchange rate of one currency against another. Currency derivatives offer flexibility and opportunities to manage currency-related risks.

Q88.

Answer: d

Explanation:

- **Climate change** is one of the major drivers behind increasing fire activity. Hotter temperatures dry out the landscape and help create the perfect environment for larger, more frequent forest fires. When forests burn, they release carbon stored in the trunks, branches, and leaves of trees, as well as carbon stored underground in the soil. As forest fires become larger and more often, they emit more carbon, further exacerbating climate change and contributing to more fires as part of a **“fire-climate feedback loop.”**
- **The large majority, roughly 70%, of all fire-related tree cover loss between 2001 and 2023 occurred in boreal regions.** In contrast, tropical regions accounted for roughly 15% of the global increase in tree cover loss from fires between 2001 and 2023. This is despite tropical forests being more susceptible to fire than temperate and subtropical forests. **So, statement I is not correct.**

- Fires are responsible for less than 10% of all tree cover loss in the tropics, common factors like commodity-driven deforestation and shifting agriculture make tropical forests less resilient and more susceptible to fires. Deforestation and forest **degradation associated with agricultural expansion lead to higher temperatures and dried-out vegetation, creating more fuel and spreading fires faster. So, statement 2 is correct.**

So, Statement–I is incorrect, but Statement–II is correct.

Therefore, option (d) is the correct answer.

Relevance: Scientists have identified Santa Ana winds and climate change as the reasons behind the recent California forest fire.

Q89.

Answer: d

Explanation:

- Indian history is a journey of resilience and innovation, where every milestone tells a story of progress. From the establishment of the first IIT to the first nuclear test at Pokhran in 1974, India demonstrated its determination to strengthen both its scientific and strategic capabilities, carving a unique place on the global stage.
- **Defence Research and Development Organisation (DRDO) was formed in 1958** from the amalgamation of the then already functioning Technical Development Establishment (TDEs) of the Indian Army and the Directorate of Technical Development & Production (DTDP) with the Defence Science Organisation (DSO). DRDO was then a small organisation with 10 establishments or laboratories. Today, DRDO is a network of around 41 laboratories and 05 DRDO Young Scientist Laboratories (DYSLs) which are deeply engaged in developing defence technologies.
- To spearhead the space research activities, **Indian National Committee for Space Research (INCOSPAR) was set up in 1962** under the Department of Atomic Energy. Subsequently, Indian Space Research Organisation (ISRO) was established in August 1969, in place of INCOSPAR. The Government of India constituted the Space Commission and established the Department of Space (DOS) in June 1972 and brought ISRO under DOS in September 1972.
- **On 18 May 1974, the Pokhran-I, codenamed “Smiling Buddha”**, was detonated through underground testing in the remote Rajasthan desert. Pokhran-I was a display of India’s nuclear technology that gave India entry to the elite nuclear club.
- The **Aryabhata spacecraft**, named after the famous Indian astronomer, was India’s first satellite; it was completely designed and fabricated in India and launched by a Soviet Kosmos-3M rocket from Kapustin Yar on **April 19, 1975.**

Therefore, option (d) is the correct answer.

Q90.

Answer: c

Explanation:

- The **Government of India Act of 1861** was a significant piece of legislation passed by the British Parliament. It was a response to the **Indian Rebellion of 1857** and aimed to **reorganize the governance structure** in India. The Act introduced important constitutional changes, including **the establishment of the legislative councils** and the empowerment of the **Viceroy**. It marked a turning point in the way British colonial rule was administered, especially in terms of the **legislative process** and the distribution of power.

- The **Government of India Act, 1861** provided for the **Viceroy** to promulgate **ordinances** during emergencies. This meant that the Viceroy could legislate on urgent matters without waiting for the formal approval of the legislative council. The ability to issue ordinances was a significant shift, granting the Viceroy more **executive authority** during critical situations. **So, Statement 1 is correct.**
- The **Government of India Act, 1861** did restore the **legislative powers of the Madras and Bombay Presidencies**. The powers had been taken away earlier via the Charter Act of 1853. **So, Statement 2 is correct.**

Therefore, option (c) is the correct answer.

Q91.

Answer: a

Explanation:

- **Biofertilizers are living microorganisms that promote plant growth. Bio-fertilisers are living microorganisms of bacterial, fungal and algal origin.** It is a product which is not chemically synthesized, which is biodegradable, and which can be used as a fertilizer. When biofertilizers are applied to seed, plant surfaces, or soil, they colonize the rhizosphere or the interior of the plant and promote growth by increasing the supply or availability of primary nutrients to the host plant.
- Based on type of microorganism, the bio-fertilizer can also be classified as follows:
 - **Bacterial Biofertilizers:** e.g. Rhizobium, Azospirillum, Azotobacter, Phosphobacteria.
 - **Fungal Biofertilizers:** e.g. Mycorrhiza
 - **Algal Biofertilizers:** e.g. Blue Green Algae (BGA) and Azolla.
 - **Actinomycetes Biofertilizer:** e.g. Frankia.
- Thus, all of the given three **are used as biofertilizers.**
- **Azotobacters are free living bacterias.** They fix nitrogen aerobically, elaborate plant hormones, solubilize phosphates and also suppress phytopathogens or reduce their deleterious effect.
- **Azolla** is a highly efficient, cost-effective and ecologically sound biofertilizer. It is widely accepted as efficient nitrogen contributor in rice ecology through symbiotically associated cyanobacteria.
- **Mycorrhiza** is a symbiotic association between a fungus and a plant. They are soil-borne fungi, which help plants take up water, nutrients, and also overcome abiotic stresses. They are considered natural biofertilizers, since they provide the host with water, nutrients, and pathogen protection.

Therefore, option (a) is the correct answer.

Q92.

Answer: d

Explanation:

- **The Gupta dynasty** followed the monarchical form of government but there were many republics that flourished under the suzerainty of the Gupta Empire. The administrative organization of the Gupta rulers may be broadly divided into two parts: **Republican States and Monarchical Government.**
- Pustapala was responsible for maintaining **official records and documents**. This role involved keeping land records, taxation details, and other administrative data crucial for governance. It ensured accountability and transparency in administration. **So, pair 1 is correctly matched.**
- Gopasramin managed **cattle and grazing lands**, which were vital to the agrarian economy of the Gupta Age. They ensured proper use of pastures and sustainable cattle management. Their role was significant in maintaining agricultural productivity. **So, pair 2 is correctly matched.**

- Prathama Kulika served as the **leader of guilds**, overseeing artisans and craftsmen. They coordinated production, resolved disputes, and ensured quality in goods. This position emphasized the importance of trade and craftsmanship in the Gupta economy. **So, pair 3 is correctly matched.**
- Purapala was the official responsible for **town administration and security**. They maintained law and order and facilitated urban planning. Their efforts contributed to the prosperity and organization of towns under Gupta rule. **So, pair 4 is correctly matched.**

So, all four of the above pairs are correctly matched.

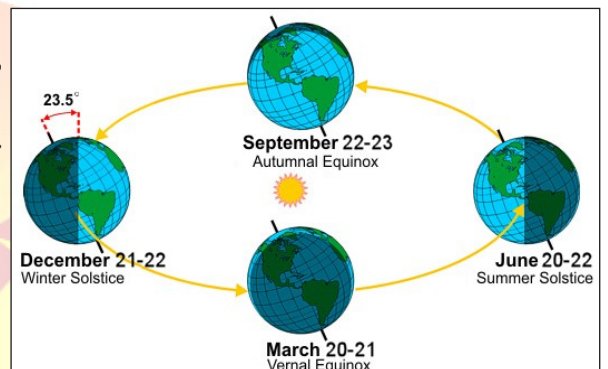
Therefore, option (d) is the correct answer.

Q93.

Answer: c

Explanation:

- There are **only two times of the year when the Earth's axis is tilted neither toward nor away from the sun**, resulting in a "nearly" equal amount of daylight and darkness at all latitudes. These events are referred to as **Equinoxes**.
 - The word equinox is **derived from two Latin words** - aequus (equal) and nox (night). At the equator, the sun is directly overhead at noon on these two equinoxes. The **"nearly" equal hours of day and night** are due to refraction of sunlight or a bending of the light's rays that **causes the sun to appear above the horizon when the actual position of the sun is below the horizon**. **So, statement 2 is correct.**
 - **At each equinox – the sun rises due east and sets due west irrespective of where one lives on the earth.** No matter where you are on Earth, the celestial equator intersects your horizon at due east and due west. **So, statement 1 is correct.**
 - The **March equinox is the vernal equinox** in the Northern Hemisphere, and the autumnal equinox in the Southern. The September equinox is the autumnal equinox in the Northern Hemisphere and the vernal in the Southern.
 - Additionally, the **days become a little longer at the higher latitudes** (those at a distance from the equator) because it takes the sun longer to rise and set. Therefore, on the equinox and for several days before and after the equinox, the **length of day will range from about 12 hours and six and one-half minutes** at the equator, to 12 hours and 8 minutes at 30 degrees latitude, to 12 hours and 16 minutes at 60 degrees latitude.



Therefore, option (c) is the correct answer.

Q94.

Answer: c

Explanation:

- Clouds are created when water vapor, an invisible gas, turns into liquid water droplets. These water droplets form on tiny particles, like dust, that are floating in the air.
- The transformation of water vapour into water is called **condensation**. Condensation is caused by the loss of heat. When moist air is cooled, it may reach a level when its capacity to hold water vapour ceases. Then, the excess water vapour condenses into liquid form. In free air, condensation results from cooling

around very small particles termed as **hygroscopic condensation nuclei**. **Particles of dust, smoke and salt from the ocean are particularly good nuclei because they absorb water.**

- Condensation takes place:
 - When the temperature of the air is reduced to dew point with its volume remaining constant
 - When both the volume and the temperature are reduced
 - When moisture is added to the air through evaporation.
- The ideal conditions for the dew formation are clear sky, calm air, high relative humidity, and cold and long nights. For the formation of **dew**, it is necessary that the **dew point is above the freezing point**.
- The ideal conditions for the formation of **frost** are the same as those for the formation of dew, except that the air temperature (dew point) must be **at or below the freezing point**.
- When the temperature of an air mass containing a large quantity of water vapour falls all of a sudden, condensation takes place within itself on fine dust particles. So, the fog is a **cloud with its base at or very near to the ground**. The only difference between the mist and fog is that mist contains more moisture than the fog.

Therefore, option (c) is the correct answer.

Q95.

Answer: c

Explanation:

- **The amount of heat** received by different parts of the Earth is **not the same** due to factors like the Earth's spherical shape, axial tilt, the length of the day, the transparency of the atmosphere, the configuration of land in terms of its aspect and rotation. The difference in heat received on Earth is the fundamental **driver of many of Earth's weather patterns and climate systems**. So, **statement I is correct**.
- **The spherical shape of the Earth** causes the **Sun's rays to fall perpendicularly near the equator and obliquely near the poles**. This results in a higher concentration of solar energy at the equator and a larger area of distribution near the poles, leading to uneven heating. This explains why **different parts of the Earth receive varying amounts of heat**, as the angle of sunlight varies across latitudes. So, **statement 2 is correct**.
- **The axial tilt of the Earth** causes seasonal variations and uneven distribution of heat between the hemispheres, but it does not result in the concentration of heat beyond the tropics. Heat is concentrated between the Tropic of Cancer and the Tropic of Capricorn, with regions beyond these receiving less solar energy. So, **statement 3 is not correct**.

So, Statement I and Statement II are correct, and Statement II provides for the correct explanation for Statement I. Statement III is not correct.

Therefore, option (c) is the correct answer.

Q96.

Answer: a

Explanation:

- **Retting is a biochemical process used to extract cellulose-rich fibres from the stems** (bast fibres) of certain plants. The process involves soaking the harvested plant stems in water to promote microbial activity. Microbes break down the pectin and hemicellulose, which bind the fibres to the woody core and other tissues, making it easier to separate the fibres.
- **Jute is a bast fibre crop** and can be harvested at any stage after a certain period of vegetative growth, usually between 100 to 150 days. The stems of the jute plant are soaked in water to extract the fibres.

After **retting**, the fibres are separated by hand. These fibres are widely used to make sacks, ropes, and mats. **So, statement 1 is correct.**

- **Mesta is a bast fibre crop** similar to jute and grows extensively in India and in some parts of Eastern Asia. Retting is the primary method to extract its fibres. It is often used as an alternative to jute for making ropes and textiles. **So, statement 2 is correct.**
- **Ramie is another bast fibre crop.** Fiber extracted from ramie stem is the longest and one of the strongest natural fine textile fibers. The plant requires retting to remove the gummy substance surrounding the fibres. Its fibres are used in textiles and blended fabrics. **So, statement 3 is correct.**
- **Sunn hemp is a bast fibre crop** where retting is employed to separate the fibres from the stems. The fibres are obtained from the outer bark of the stem of sunn hemp plant. Its fibres are used for making ropes, canvas, and twines. **So, statement 4 is correct.**
- **Cotton is not a bast fibre crop.** It is a seed fibre crop where fibres are Fcted directly from the seed hairs of the cotton bolls. The fibres are separated through a mechanical process called ginning, not retting. **So, statement 5 is not correct.**

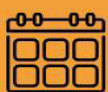
Therefore, option (a) is the correct answer.

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Q97.

Answer: b

Explanation:

- **Port Newark** is a container Port in the **United States of America** in the state of New Jersey. Port Newark Container Terminal (PNCT) is the **only Container Ports in the World to use part of its active operational footprint (10 acres)**. An active operational footprint is a business's strategy for managing its environmental impact while running its operations that provides a dual purpose, in-terminal solar energy generation by using elevated photovoltaic solar panel canopies. It is a major container port in the U.S. and among the busiest on the East Coast. **So, pair 1 is not correctly matched.**
- **The Port of Qingdao** which commenced operations in 1892 is **not the world's largest cargo port**. Located between the Bohai Rim port region and the **Yangtze River Delta port** region in the **People's Republic of China** and occupied a central position among ports in Northeast Asia, the Port of Qingdao is one of the most comprehensive ports in the world, and an important hub for international trade and transportation in the West Pacific. **So, pair 2 is correctly matched.**
 - **Shanghai Port** is an international seaport near the Yangtze River east of the People's Republic of China and is the **world's largest and busiest port**.
- **Yanbu Commercial Port** located in **Saudi Arabia** and was opened in 1965. Yanbu Commercial Port is strategically located to serve the local economies of Saudi Arabia's **Madina and Qassim regions**, two of the Kingdom's most promising trade centers. Yanbu Commercial Port is a **main gateway to the holy city of Madina in Saudi Arabia**. **So, pair 3 is correctly matched.**

So, only two of the pairs given above are correctly matched.

Therefore, option (b) is the correct answer.

Q98.

Answer: c

Explanation:

- Among the early foreign visitors to India who left a written account of their experiences of this country, the accounts of the Arab travelers form an interesting genre of travel writings. As a nomadic tribe as well as itinerant merchants the Arabs had been avid travelers from a very early time.
- Amongst the most celebrated amongst them is **Al Masudi who is often referred to as the Herodotus of the Arabs**, for his far reaching descriptions of the natural history. In his travelogues he also left a vivid description of India.
- Al Masudi was born before 893 CE in Baghdad, Iraq. His travels extended to Syria, Iran, Armenia, the shores of the Caspian Sea, the Indus Valley, Sri Lanka, Oman, and the east coast of Africa, as far south as Zanzibar, and possibly to Madagascar.
 - Al Masudi visited India in **c.915-16AD**. At that time the **Pratihara king Bhoja** was at the throne of Malwa. **So, statement 1 is correct.**
 - He recorded his travelogues in his seminal work Akhbar uz-Zaman or 'The History of Time.' **So, statement 2 is correct.**
- It is interesting to note that though he received reception from the Pratiharas, in his writings he mentioned Vallabhraja, the Rashtrakuta king contemporary of Bhoja, as the most powerful king in India.
- He gave a detailed description of Indian society and polity, at times praising Indians for their hospitality and mentioned them to be virtuous who didn't consume liquor and looked down upon the one who did so. He commended Indians for being secular and tolerant.

- An interesting aspect of his writings is the **grandeur mention of elephants** being used in war, and as beast of burden.
- It is worth noting that elephants were a thing of awe for the Arabs and Turks, during the first battle of Terrain, the forces of Muhammad Ghazni for the first time saw elephants and were afraid enough to move forward.

Therefore, option (c) is the correct answer.

Q99.

Answer: c

Explanation:

- The Vedic philosophical concepts gave rise to six different schools of philosophies called shada darshana. They fall in the category of the orthodox system as the final authority of the Vedas is recognised by all of them. They are **Samkhya, Yoga, Nyaya, Veisheshika, Mimamsa and Vedanta**.
 - **Heterodox Schools** do not believe in the originality of the Vedas and question the existence of God. They are divided into three major sub schools: **Buddhism, Jainism and Lokayata**.
- The **origin of Yoga is found in the Yogasutra of Patanjali** believed to have been **written in the second century BC**. It argues that human beings can achieve salvation by combining meditation and physical application of yogic techniques. It is argued that **these techniques lead to the release of Purusha from the Prakriti** and would eventually lead to salvation.
- The **Mimamsa philosophy** is one among the other schools of Indian philosophy. The Mimamsa School was **founded by Jaimini in 400 B.C**. He was the author of 'Mimamsa sutra'. Like Nyaya-Vaisesika and Samkhya-Yoga, Mimamsa-Vedanta is considered as an allied system of Indian school of thought. The word 'mimamsa' means 'revered thought', which is to be applied originally in the interpretation of the vedic rituals. Mimamsa deals with the initial part of the Veda and is therefore called Purva-Mimamsa. The initial part of the Veda concerns human action, their rituals and the sacrifices. It is thus known as karmakanda.
- **Brihaspati** is supposed to be the founder of the **Charvaka School of philosophy**. He lived in about the **6th century BC**. It finds mention in the Vedas and Brihadaranyaka Upanishad. Thus, **it is supposed to be one of the earliest in the growth of philosophical knowledge**. It holds that knowledge is the product of the combination of four elements which leaves no trace after death. Charvaka philosophy deals with materialistic philosophy. It is also known as the **Lokayata Philosophy** - the philosophy of the masses. According to Charvaka there is no other world. Hence, death is the end of humans and **pleasure the ultimate object in life. Charvaka recognises no existence other than this material world**.
- **Vedanta school** upholds the philosophies of life as elaborated in the Upanishads. The oldest text that formed the basis of this philosophy was Brahmasutra of Badarayana. According to Vedanta philosophy, 'Brahman is true, the world is false and self and Brahman are not different. **This philosophy evolved in 9th century AD through the philosophical intervention of Shankaracharya** who wrote commentaries on the Upanishads and the Bhagavad Gita. Shankaracharya's discourse or his philosophical views came to be known as **Advaita Vedanta**.

Therefore, option (c) is the correct answer.

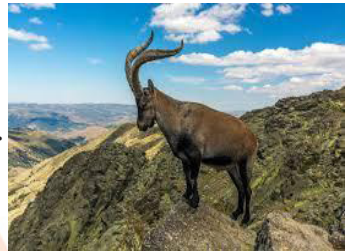
Q100.

Answer: c

Explanation:

- **Jack rabbits** are adapted to open, rugged, and often mountainous terrains, which are characteristic of **montane (mountain) forests**. These areas provide the open spaces and sparse vegetation suitable for jack rabbits.
- **The wild ibex** is a mountain goat species that inhabits the high, rocky, and often steep areas of the **montane forests**. These regions provide the steep, rugged conditions that ibexes prefer.
- **The red panda** is typically found in the **montane forests** of the Himalayas and surrounding mountain ranges. These forests are cool and temperate, with dense vegetation, including bamboo, which is essential for the red panda's diet.

Therefore, option (c) is the correct answer.



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