

जब तक आपको यह परीक्षण पुस्तिका खोलने को न कहा जाए तब तक न खोलें

परीक्षण पुस्तिका अनुक्रम

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परीक्षण पुस्तिका  
सामान्य अध्ययन  
टेस्ट - 19

C

समय : दो घण्टे

पूर्णांक : 200

### अनुदेश

1. परीक्षा प्रारम्भ होने के तुरन्त बाद, आप इस परीक्षण पुस्तिका की पड़ताल अवश्य कर लें कि इसमें कोई बिना छपा, फटा या छूटा हुआ पृष्ठ अथवा प्रश्न आदि न हो। यदि ऐसा हो तो इसे सही परीक्षण पुस्तिका से बदल लीजिए।
2. उत्तर-पत्रक में सही स्थान पर परीक्षण पुस्तिका अनुक्रम A, B, C या D यथास्थिति स्पष्ट रूप से कूटबद्ध कीजिये।
3. इस पंक्ति के साथ में दिये गए कोष्ठक में आपको अपना अनुक्रमांक लिखना है। परीक्षण पुस्तिका पर और कुछ न लिखें।
4. इस परीक्षण पुस्तिका में 100 प्रश्नांश (प्रश्न) दिये गए हैं। प्रत्येक प्रश्नांश हिन्दी और अंग्रेजी में छपा है। प्रत्येक प्रश्नांश में चार प्रत्युत्तर (उत्तर) दिये गए हैं। इनमें से एक प्रत्युत्तर को चुन लें जिसे आप उत्तर-पत्रक पर अंकित करना चाहते हैं। यदि आपको ऐसा लगे कि एक से अधिक प्रत्युत्तर सही हैं तो उस प्रत्युत्तर को अंकित करें जो आपको सर्वोत्तम लगे। प्रत्येक प्रश्नांश के लिये केवल एक ही प्रत्युत्तर चुनना है।
5. आपको अपने सभी प्रत्युत्तर अलग से दिये गए उत्तर-पत्रक पर ही अंकित करने हैं। उत्तर-पत्रक में दिये गए निर्देश देख लें।
6. सभी प्रश्नों के अंक समान हैं।
7. इससे पहले कि आप परीक्षण पुस्तिका के विभिन्न प्रश्नांशों के प्रत्युत्तर उत्तर पत्रक पर अंकित करना शुरू करें, आपको प्रवेश प्रमाण-पत्र के साथ प्रेषित अनुदेशों के अनुसार कुछ विवरण उत्तर-पत्रक में देने हैं।
8. आप अपने सभी प्रत्युत्तरों को उत्तर-पत्रक में भरने के बाद तथा परीक्षा के समापन पर केवल उत्तर-पत्रक अधीक्षक को सौंप दें। आपको अपने साथ परीक्षण पुस्तिका ले जाने की अनुमति है।
9. कच्चे काम के लिये कुछ पत्रक परीक्षण पुस्तिका के अंत में संलग्न हैं।
10. गलत उत्तरों के लिये दंड:  
वस्तुनिष्ठ प्रश्न-पत्रों में उम्मीदवार द्वारा दिये गए गलत उत्तरों के लिये दंड दिया जाएगा।
  - (i) प्रत्येक प्रश्न के लिये चार वैकल्पिक उत्तर हैं। उम्मीदवार द्वारा प्रत्येक प्रश्न के लिये दिये गए एक गलत उत्तर के लिये प्रश्न हेतु नियत किये गए अंकों का एक-तिहाई दंड के रूप में काटा जाएगा।
  - (ii) यदि कोई उम्मीदवार एक से अधिक उत्तर देता है, तो इसे गलत उत्तर माना जाएगा, चाहे दिये गए उत्तरों में से एक उत्तर सही हो, उस प्रश्न के लिये उपर्युक्तानुसार ही दंड दिया जाएगा।
  - (iii) यदि उम्मीदवार द्वारा कोई प्रश्न हल नहीं किया जाता है, अर्थात् उम्मीदवार द्वारा उत्तर नहीं दिया जाता है, तो उस प्रश्न के लिये कोई दण्ड नहीं दिया जाएगा।

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ध्यान दें : अनुदेशों का अंग्रेजी रूपान्तर इस पुस्तिका के अंतिम पृष्ठ पर छपा है।

1. इंटरनेशनल ट्राॅपिकल टिम्बर काउंसिल (ITTO) के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. इस पर संधि वार्ता संयुक्त राष्ट्र पर्यावरण कार्यक्रम (UNEP) के तत्वाधान में की गई थी।
2. इसका मुख्यालय ओसाका, जापान में है।
3. भारत इसका सदस्य नहीं है।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक (b) केवल दो  
(c) सभी तीन (d) कोई भी नहीं

2. बाघों के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. राष्ट्रीय बाघ गणना हर चार वर्ष में राष्ट्रीय बाघ संरक्षण प्राधिकरण (NTCA) द्वारा की जाती है।
2. असम में ओरंग टाइगर रिजर्व कोर एरिया के आधार पर सबसे छोटा टाइगर रिजर्व है।
3. नवीनतम बाघ गणना के अनुसार भारत में 3000 से अधिक बाघ हैं।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक (b) केवल दो  
(c) सभी तीन (d) कोई भी नहीं

3. निम्नलिखित पर विचार कीजिये:

1. ऑपरेशन सेव कुर्मा
2. थंडरबर्ड
3. लेसनो
4. बिरबिल
5. सॉफ्ट गोल्ड

उपर्युक्त में से कितने वन्यजीव ऑपरेशन वन्यजीव अपराध नियंत्रण ब्यूरो (WCCB) द्वारा संचालित हैं?

- (a) केवल दो (c) केवल तीन  
(b) केवल चार (d) सभी पाँच

4. राष्ट्रीय बांस मिशन के कार्यान्वयन के लिये निम्नलिखित में से कौन-सा मंत्रालय नोडल मंत्रालय है?

- (a) पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय  
(b) कृषि और किसान कल्याण मंत्रालय  
(c) विज्ञान और प्रौद्योगिकी मंत्रालय  
(d) सहकारिता मंत्रालय

5. हिमालयन वुल्फ के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. हाल ही में, IUCN द्वारा पहली बार हिमालयन वुल्फ का आकलन किया गया।
2. वन्य क्षेत्रों में ये केवल भारत में ही पाए जाते हैं।
3. इन्हें IUCN की रेड लिस्ट के तहत 'लुप्तप्राय' के रूप में वर्गीकृत किया गया है।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक (b) केवल दो  
(c) सभी तीन (d) कोई भी नहीं

6. हाल ही में जन-समाचारों में देखे गए, 'मंडुवा' और 'झंगोरा' हैं

- (a) पारंपरिक भारतीय नृत्य विधाएँ  
(b) पक्षियों की लुप्तप्राय प्रजातियाँ  
(c) भारत में प्रसिद्ध नदियाँ  
(d) मिलेट्स प्रजातियों की किस्से

7. वन्यजीव (संरक्षण) संशोधन अधिनियम 2022 के संदर्भ में, निम्नलिखित युग्मों पर विचार कीजिये:

अनुसूची शामिल विषय

1. अनुसूची I : उच्चतम स्तर की सुरक्षा वाली प्राणी प्रजातियाँ
2. अनुसूची II : संकटमय प्राणी प्रजातियाँ जिनके संरक्षण की आवश्यकता है
3. अनुसूची III : CITES के तहत अनुसूचित प्रतिदर्श
4. अनुसूची IV : संरक्षित पादप प्रजातियाँ

उपर्युक्त में से कितने युग्म सही सुमेलित हैं?

- (a) केवल एक (b) केवल दो  
(c) केवल तीन (d) सभी चार

8. 'कायांतरण' की जैविक परिघटना के संदर्भ में, निम्नलिखित में से कौन-सा कथन सही नहीं है?

- (a) इस परिघटना में प्रजाति के वयस्क जीव भोजन और अन्य संसाधनों के लिये किशोरों के साथ प्रतिस्पर्धा करते हैं।  
(b) इसके परिणामस्वरूप प्रजाति के अधिक सदस्य यौन परिपक्वता तक जीवित रह सकते हैं।  
(c) मेंढक और तितलियाँ अपने जीवनकाल में कायांतरण का अनुभव करते हैं।  
(d) यह जीव के वयस्क बनने पर संपूर्ण शारीरिक रूपरेखा को बदल सकता है।

1. With reference to International Tropical Timber Council (ITTO), consider the following statements :

1. It was negotiated under the auspices of the United Nation Environment Programme (UNEP).
2. It is headquartered at Osaka, Japan.
3. India is not a member of the council.

How many of the above statements are correct?

- (a) Only one                      (b) Only two  
(c) All three                      (d) None

2. With reference to Tigers, consider the following statements :

1. The national tiger census is done every four years by the National Tiger Conservation Authority (NTCA).
2. Orang tiger reserve in Assam is the smallest tiger reserve on the basis of core area.
3. There are more than 3000 tigers in India as per the latest tiger census.

How many of the above statements are correct?

- (a) Only one                      (b) Only two  
(c) All three                      (d) None

3. Consider the following :

1. Operation Save Kurma
2. Thunderbird
3. LESKNOW
4. BIRBIL
5. SOFT GOLD

How many of the above wildlife operations are conducted by the Wildlife Crime Control Bureau (WCCB)?

- (a) Only two                      (c) Only three  
(c) Only four                      (d) All five

4. Which of the following is the nodal ministry for implementation of National Bamboo Mission ?

- (a) Ministry of Environment, Forest and Climate Change  
(b) Ministry of Agriculture & Farmers Welfare  
(c) Ministry of Science and Technology  
(d) Ministry of Cooperation

5. With reference to the Himalayan Wolf, consider the following statements :

1. Recently, Himalayan Wolf was assessed for the first time by IUCN.
2. In the wild, they are only found in India.
3. They have been classified as 'Endangered' under IUCN's Red list.

How many of the above statements are correct?

- (a) Only one                      (b) Only two  
(c) All three                      (d) None

6. Recently seen in news, 'Mandua' and 'Jhangora' are

- (a) Traditional Indian Dance Forms  
(b) Endangered Species of Birds  
(c) Famous Rivers in India  
(d) Varieties of Millet species

7. With reference to Wildlife (Protection) Amendment Act 2022, consider the following pairs :

*Schedule                      Deals with*

1. Schedule I                      : Animal species enjoying the highest level of protection
2. Schedule II                      : Animal species subject to a lesser degree of protection
3. Schedule III                      : Scheduled specimens under CITES
4. Schedule IV                      : Protected plant species

How many of the above pairs are correctly matched?

- (a) Only one                      (b) Only two  
(c) Only three                      (d) All four

8. Which among the following statements is **not** correct with reference to the biological phenomenon of 'Metamorphosis'?

- (a) In this, adult organisms of the species compete with juveniles for food and other resources.  
(b) It may result in more members of the species surviving to sexual maturity.  
(c) Frogs and butterflies experience metamorphosis in their lifetime.  
(d) It may change organism's whole-body plan to become an adult.

9. एक पुष्प को मधुमक्खी द्वारा परागित किया जाता है, जबकि बदले में, यह कीट को मकरंद प्रदान करती है। उपरोक्त पंक्ति में निम्नलिखित में से किस जैविक पारस्परिक क्रिया का उल्लेख किया गया है?
- (a) सहोपकारिता (b) परजीविता  
(c) सहभोजिता (d) स्पर्द्धा
10. माइकोरिजल एसोसिएशन से प्रत्यक्ष रूप से एक पौधे को निम्नलिखित में से कौन-सा लाभ मिलता है?
- (a) प्रकाश संश्लेषण क्षमता में वृद्धि।  
(b) मृदा के पोषक तत्वों और जल तक पहुँच में वृद्धि।  
(c) हानिकारक पशु गतिविधियों का प्रतिरोध।  
(d) पर्यावरणीय तनाव के प्रति बेहतर सहनशीलता।
11. कीटभक्षी पादपों के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:
1. ये पादप मुख्य रूप से सल्फर, पोटेशियम और फास्फोरस की कमी वाली मृदा में उगते हैं।  
2. ये पादप शुष्क, ठंडे और सदाबहार वनों में उगते हैं।
- उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?
- (a) केवल 1  
(b) केवल 2  
(c) 1 और 2 दोनों  
(d) न तो 1 और न ही 2
12. पादप संवहनी तंत्र के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:
1. फ्लोएम पौधों के हार्मोन और mRNA का विसरण करता है।  
2. परासरण से उत्पन्न स्फीति दाब फ्लोएम ऊतक में रस के प्रवाह को शक्ति प्रदान करता है।  
3. परिपक्व फ्लोएम एक मृत ऊतक है।
- उपर्युक्त में से कितने कथन सही हैं?
- (a) केवल एक  
(b) केवल दो  
(c) सभी तीन  
(d) कोई भी नहीं

13. मानव हृदय के संबंध में, निम्नलिखित में से कौन-सा कथन सही है?
1. फुफ्फुसीय शिरा फेफड़ों से ऑक्सीजन युक्त रक्त को हृदय तक ले जाती है।  
2. फुफ्फुसीय धमनी हृदय से फेफड़ों तक ऑक्सीजन रहित रक्त ले जाती है।  
3. ट्राइकस्पिड वाल्व बाएँ आलिंद और बाएँ निलय के बीच होता है।
- नीचे दिये गए कूट का प्रयोग कर सही उत्तर चुनिये:
- (a) 1 और 2 (b) 2 और 3  
(c) 1 और 3 (d) 1, 2 और 3
14. निम्नलिखित में से कौन-सा एंजाइम जीवों में जीवसंदीप्ति से जुड़ा है?
- (a) लाइपेज (b) लूसिफेरेज  
(c) पेरोक्सीडेज (d) राइबोन्यूक्लिज
15. निम्नलिखित पर विचार कीजिये:
1. कवक 2. ऐंजौला  
3. सायकस 4. लैग्यूम
- उपरोक्त में से कितने एक विशेष संबंध को दर्शाते हैं जिसे सहजीविता कहा जाता है और इसके परिणामस्वरूप सहजीवी नाइट्रोजन का स्थिरीकरण होता है?
- (a) केवल एक (b) केवल दो  
(c) केवल तीन (d) सभी चार
16. पौधों की निम्नलिखित प्रजातियों पर विचार कीजिये:
1. खीरा 2. नारियल  
3. सेब 4. पालक
- उपर्युक्त में से कितने एकलिंगाश्रयी पौधों के उदाहरण हैं?
- (a) केवल एक (b) केवल दो  
(c) केवल तीन (d) सभी चार
17. एब्सिसिक अम्ल, जिबरेलिन और साइटोकाइनिन किससे जुड़े हैं
- (a) पशुओं के शरीर से निकलने वाले एंजाइम  
(b) प्राकृतिक रूप से पौधों में पाए जाने वाले हार्मोन  
(c) कृषि में प्रयुक्त होने वाले उर्वरक  
(d) बुखार और सर्दी के उपचार के लिये पशुओं को दी जाने वाली दवा

9. A flower is pollinated by a bee, while, in return, it provides the insect with nectar. Which among the following biological interactions is mentioned in the above line ?
- (a) Mutualism (b) Parasitism  
(c) Commensalism (d) Competition
10. Which among the following benefits does a plant directly get from mycorrhizal association ?
- (a) Increased photosynthesis efficiency.  
(b) Increased access to soil nutrients and water.  
(c) Resistance to harmful animal activities.  
(d) Improved tolerance to environmental stress.
11. Consider the following statements with reference to Insectivorous plants :
1. These plants are mainly grown in Sulphur, Potassium and Phosphorus deficient soil.
  2. These plants are grown in dry, cold and evergreen forests.
- Which of the statements given above is/are correct ?
- (a) 1 only  
(b) 2 only  
(c) Both 1 and 2  
(d) Neither 1 nor 2
12. Consider the following statements with reference to plant vascular system :
1. Phloem transports plant hormones and mRNA.
  2. Turgor pressure from osmosis powers the flow of sap in phloem tissue.
  3. Mature Phloem is a dead tissue.
- How many of the above statements are correct ?
- (a) Only one  
(b) Only two  
(c) All three  
(d) None
13. Which of the following statements regarding the human heart is correct ?
1. The pulmonary vein carries oxygenated blood from the lungs to the heart.
  2. The pulmonary artery carries deoxygenated blood from the heart to the lungs.
  3. The tricuspid valve is between the left atrium and the left ventricle.
- Select the correct answer using the code below :
- (a) 1 and 2 (b) 2 and 3  
(c) 1 and 3 (d) 1, 2 and 3
14. Which among the following enzyme is associated with bioluminescence in organisms ?
- (a) Lipase (b) Luciferase  
(c) Peroxidase (d) Ribonuclease
15. Consider the following :
1. Fungus
  2. Azolla
  3. Cycas
  4. Legumes
- How many of the above show a special relationship called symbiosis and this results in symbiotic nitrogen fixation ?
- (a) Only one (b) Only two  
(c) Only three (d) All four
16. Consider the following species of the plants :
1. Cucumber
  2. Coconut
  3. Apple
  4. Spinach
- How many of the above are examples of dioecious plants generally ?
- (a) Only one (b) Only two  
(c) Only three (d) All four
17. Absciscic acid, Gibberellins and Cytokinin are associated with
- (a) Enzymes released in animal body  
(b) Hormones found in plants naturally  
(c) Fertilizers used in agriculture  
(d) Medicine given to animals to treat fever and cold

18. विषाणु के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. एक विषाणु मेजबान कोशिका के बिना, अपने आप ही प्रतिकृति बना सकता है।
2. विषाणु जीवाणु को संक्रमित कर सकते हैं।
3. विषाणु में RNA और DNA मौजूद नहीं होते हैं।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक
- (b) केवल दो
- (c) सभी तीन
- (d) कोई भी नहीं

19. लॉजिस्टिक्स ईज अक्रॉस डिफरेंट स्टेड्स (LEADS) रिपोर्ट निम्नलिखित में से किसके द्वारा जारी की जाती है:

- (a) नीति आयोग
- (b) वाणिज्य और उद्योग मंत्रालय
- (c) सड़क परिवहन और राजमार्ग मंत्रालय
- (d) वित्त मंत्रालय

20. भारतीय भूवैज्ञानिक सर्वेक्षण (GSI) के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. नेशनल जियोसाइंस डेटा रिपोजिटरी (NGDR) पोर्टल GSI के नेतृत्व में संचालित है।
2. GSI की स्थापना आरंभ में रेलवे के लिये कोयला खोजने के प्राथमिक उद्देश्य से की गई थी।
3. GSI का मुख्यालय देहरादून में है।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक
- (b) केवल दो
- (c) सभी तीन
- (d) कोई भी नहीं

21. निम्नलिखित में से कौन-सा विकल्प 'अराजक-पूँजीवाद' के राजनीतिक दर्शन का सर्वोत्तम वर्णन करता है?

- (a) लोग केंद्रीकृत राज्य तंत्र की अनुपस्थिति में स्थानीय कानून और व्यवस्था का संचालन करते हैं।
- (b) कानून और व्यवस्था का प्रबंधन स्थानीय वॉरलॉर्ड्स द्वारा किया जाता है जबकि केंद्रीकृत राज्य, विदेशी मामलों का प्रबंधन करता है।
- (c) मुक्त बाजार में निजी कंपनियाँ कानून और व्यवस्था का प्रबंधन करती हैं जबकि राज्य उन्मूलित होता है।
- (d) निजी कंपनियाँ शासन को राजनीतिक-वित्तीय समर्थन के बदले में राज्य से भारी रियायतें लेती हैं।

22. हाल ही में जन-समाचारों में रहे 'डिक्नेश' और 'सेलम' निम्नलिखित में से किसको संदर्भित करते हैं?

- (a) क्षुद्रग्रह और उसका उपग्रह
- (b) विशाल गैसीय ग्रह और उसका उपग्रह
- (c) लाल विशाल तारा और उसका निकटतम ग्रह
- (d) पृथ्वी जैसा ग्रह और उसका सबसे ऊँचा पर्वत

23. कैंसर के उपचार से संबंधित अक्टोसाइट टैबलेट के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. यह दवा इंटरनेशनल एजेंसी फॉर रिसर्च ऑन कैंसर (IARC) द्वारा विकसित की गई है।
2. इसे भारतीय खाद्य सुरक्षा और मानक प्राधिकरण (FSSAI) से मजूरी मिल गई है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1
- (b) केवल 2
- (c) 1 और 2 दोनों
- (d) न तो 1 और न ही 2

24. साहित्य अकादमी पुरस्कार के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. यह भारत सरकार द्वारा दिया जाने वाला सर्वोच्च साहित्यिक सम्मान है।
2. पुरस्कार हेतु पात्रता के लिये लेखक का भारतीय नागरिक होना आवश्यक है।
3. पुरस्कार हेतु पात्रता के लिये साहित्यिक कृति संविधान की 8वी अनुसूची में सूचीबद्ध 22 भाषाओं में से एक में मूल कृति होनी चाहिये।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक
- (b) केवल दो
- (c) सभी तीन
- (d) कोई भी नहीं



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18. Consider the following statements with reference to virus :

1. A virus can replicate on its own, without a host cell.
2. Viruses can infect bacteria.
3. RNA and DNA are not present in viruses.

How many of the above are correct?

- (a) Only one                      (b) Only two  
(c) All three                      (d) None

19. Logistics Ease Across Different States (LEADS) report is released by which of the following?

- (a) NITI Aayog  
(b) Ministry of Commerce and Industry  
(c) Ministry of Road Transport and Highways  
(d) Ministry of Finance

20. Consider the following statements with reference to Geological Survey of India (GSI):

1. GSI is spearheading the National Geoscience Data Repository (NGDR) Portal.
2. GSI was initially set up with the primary purpose of finding coal for the railways.
3. GSI has its headquarter in Dehradun.

How many of the above statements are correct?

- (a) Only one                      (b) Only two  
(c) All three                      (d) None

21. Which of the following best describes the political philosophy of 'anarcho-capitalism'?

- (a) People run their local law and order arrangement in absence of any centralized state mechanism.  
(b) Law and order is managed by local warlords while the centralized state manages foreign affairs.  
(c) Private companies manage law and order in free market while state is abolished.  
(d) Private companies extract heavy concessions from state in lieu of politico-financial support to the regime.

22. Recently in news, 'Dinkinesh' and 'Selam' refer to which of the following?

- (a) Asteroid and its satellite  
(b) Gas giant planet and its satellite  
(c) Red Giant star and its closest planet  
(d) Earth like planet and its tallest mountain

23. Consider the following statements with reference to AKTOCYTE tablets related to Cancer treatment:

1. The medicine has been developed by the International Agency for Research on Cancer (IARC).
2. It has received approval from Food Safety and Standards Authority of India (FSSAI).

Which of the statements given above is/are correct?

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

24. Consider the following statements with reference to Sahitya Akademi Award:

1. It is the highest literary honour by the Government of India.
2. The author must be an Indian national to be eligible for the awards.
3. The literary work must be an original work in one of the 22 languages listed in the 8th Schedule of the Constitution only to be eligible for the awards.

How many of the above statements are correct?

- (a) Only one  
(b) Only two  
(c) All three  
(d) None

25. अंतरिक्ष उड़ान से संबंधित निम्नलिखित प्रौद्योगिकियों पर विचार कीजिये:

1. क्रायोजेनिक रॉकेट प्रणोदन इंजन
2. रहने योग्य कक्षीय मॉड्यूल
3. जीवन समर्थन प्रणाली
4. ह्यूमन-रेटेड लॉन्च व्हीकल
5. तरल चालित रॉकेट इंजन
6. कर्मीदल निकासी प्रणाली

उपर्युक्त में से कितनी तकनीकें इसरो के लिये नवीन हैं जिनका प्रयोग गगनयान कार्यक्रम के लिये किया जाएगा?

- (a) केवल तीन (b) केवल चार  
(c) केवल पाँच (d) सभी छह

26. भारत में बलात श्रम उन्मूलन के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. भारत ने बलात श्रम के सबसे खराब रूपों पर अंतर्राष्ट्रीय श्रम संगठन (ILO) के कन्वेंशन की पुष्टि की है।
2. वर्ष 2025 तक बलात श्रम के सबसे खराब रूपों का उन्मूलन सतत् विकास लक्ष्यों (SDG) का हिस्सा है।
3. संविधान का अनुच्छेद 24 किसी भी कारखाने, खदान या परिसंकटमय नियोजन में 16 वर्ष से कम उम्र के बच्चों को नियोजित करने पर प्रतिबंध लगाता है।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक (b) केवल दो  
(c) सभी तीन (d) कोई भी नहीं

27. 'द ग्लोबल क्लाइमेट 2011-2020' रिपोर्ट के संबंध में, निम्नलिखित कथनों पर विचार कीजिये:

1. यह संयुक्त राष्ट्र पर्यावरण कार्यक्रम (UNEP) द्वारा प्रकाशित की जाती है।
2. 2011-2020 का दशक स्थल और महासागर दोनों के लिये अबतक का सबसे गर्म दशक दर्ज किया गया।
3. 2011-2020 के दशक में अंटार्कटिक ओजोन छिद्र न तो कम हुआ है और न ही उल्लेखनीय रूप से बढ़ा है।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक (b) केवल दो  
(c) सभी तीन (d) कोई भी नहीं

28. UNFCCC के पक्षकारों के सम्मेलन (COP-28) के परिणामों के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. COP 28 घोषणा का लक्ष्य वर्ष 2050 तक नवीकरणीय ऊर्जा की वैश्विक स्थापित क्षमता को तीन गुना करना है।
2. जलवायु प्रेरित आपदाओं से प्रभावित देशों को आर्थिक रूप से मदद करने के उद्देश्य से हानि और क्षति कोष का संचालन किया गया।
3. भारत सहित 100 देशों के एक समूह ने 2030 तक अपने मीथेन उत्सर्जन को 30% तक कम करने की स्वैच्छिक प्रतिबद्धता जताई।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक (b) केवल दो  
(c) सभी तीन (d) कोई भी नहीं

29. ग्लोबल कूलिंग प्लेज के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. इसे संयुक्त अरब अमीरात और कूल कॉएलेशन द्वारा UNFCCC के COP-28 में लॉन्च किया गया था।
2. इसका एक उद्देश्य वर्ष 2050 तक वैश्विक शीतलन संबंधी उत्सर्जन को 68% तक कम करना है।
3. भारत उन देशों में से एक है जिन्होंने इस पर हस्ताक्षर किये हैं।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक (b) केवल दो  
(c) सभी तीन (d) कोई भी नहीं

30. निम्नलिखित पर विचार कीजिये:

1. प्रत्यक्ष वायु अवशोषण के माध्यम से कार्बन डाइऑक्साइड का निष्कर्षण
2. परावर्तक पेंट के साथ संरचनाओं का रंगरोगन
3. समुद्री मेघों की परावर्तनशीलता को बढ़ाना
4. अवरक्त अवशोषण करने वाले मेघों का निष्कर्षण
5. निचले समताप मंडल में एरोसोल को अंतःक्षेपित करना
6. पुनर्वनरोपण

उपर्युक्त में से कितनी तकनीकें जलवायु अभियांत्रिकी तकनीकों का हिस्सा हैं?

- (a) केवल तीन (b) केवल चार  
(c) केवल पाँच (d) सभी छह



25. Consider the following technologies related to spaceflight:

1. Cryogenic rocket propulsion engine
2. Habitable orbital module
3. Life support system
4. Human rated launch vehicle
5. Liquid propelled rocket Engine
6. Crew escape system

How many of the above technologies are new for ISRO that will be needed for Gaganyaan Programme specially?

- (a) Only three                      (b) Only four  
(c) Only five                      (d) All six

26. With reference to elimination of child labour in India, consider the following statements:

1. India has ratified the International Labour Organisation (ILO) convention on worst forms of child labour.
2. Elimination of worst forms of child labour by 2025 is part of the Sustainable Development Goals (SDGs).
3. Article 24 of Constitution prohibits employment of children below age of 16 in any factory, mine or hazardous occupation.

How many of the above statements are correct?

- (a) Only one                      (b) Only two  
(c) All three                      (d) None

27. Consider the following statements with respect to 'The Global Climate 2011-2020' report:

1. It is published by United Nations Environment Programme (UNEP).
2. The decade 2011-2020 is the warmest decade on record for both land and ocean.
3. The Antarctic Ozone Hole has neither diminished nor increased significantly in the 2011-2020 decade.

How many of the above statements are correct?

- (a) Only one                      (b) Only two  
(c) All three                      (d) None

28. Consider the following statements with reference to outcomes of Conference of parties (COP-28) of UNFCCC:

1. The COP 28 declaration aims to triple the global installed renewable energy generation capacity by 2050.
2. The Loss and Damage Fund aimed at financially helping countries affected by climate induced disasters was operationalised.
3. A group of 100 countries including India made a voluntary commitment to reduce their methane emissions by 30% by 2030.

How many of the above statements are correct?

- (a) Only one                      (b) Only two  
(c) All three                      (d) None

29. Consider the following statements with reference to Global Cooling Pledge:

1. It was launched by the UAE and the Cool Coalition at the COP-28 of UNFCCC.
2. One of its aims is to reduce global cooling related emissions by 68% by 2050.
3. India is one of the countries who have signed the pledge.

How many of the above statements are correct?

- (a) Only one                      (b) Only two  
(c) All three                      (d) None

30. Consider the following:

1. Carbon dioxide removal by direct air capture
2. Painting structure with reflective paint
3. Enhancing the reflectivity of marine clouds
4. Removing infrared absorbing clouds
5. Injecting aerosols into the lower stratosphere
6. Reforestation

How many of the above techniques are a part of climate engineering techniques?

- (a) Only three                      (b) Only four  
(c) Only five                      (d) All six

31. गतिशील भूजल संसाधन आकलन रिपोर्ट, 2023 के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. राज्यों/केंद्रशासित प्रदेशों के सहयोग से केंद्रीय भूजल बोर्ड (CGWB) द्वारा समय-समय पर यह आकलन रिपोर्ट जारी की जाती है।
2. वर्ष 2023 की रिपोर्ट में पिछले वर्ष की तुलना में भूजल पुनर्भरण में कमी दर्ज की गई है।
3. देश में कुल वार्षिक भूजल दोहन कुल वार्षिक भूजल पुनर्भरण से अधिक है।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक
- (b) केवल दो
- (c) सभी तीन
- (d) कोई भी नहीं

32. हाल ही में कलाकड़ मुंडनथुराई टाइगर रिजर्व में खोजी गई नई प्रजाति 'इम्पेतिन्स करुप्पुसाम्य' निम्नलिखित में से किसकी प्रजाति है?

- (a) मीठे पानी के उभयचर की
- (b) मीठे पानी की मछली की
- (c) पुष्पीय पौधे की
- (d) पश्चिमी घाट में स्थानिक पक्षी की

33. मल्टी-फंक्शन क्रिप्टो-एसेट इंटरमीडियरीज (MCI) के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. MCI ऐसी कंपनियाँ हैं जो मुख्य रूप से ट्रेडिंग प्लेटफॉर्म के संचालन पर केंद्रित क्रिप्टो-आधारित सेवाओं, उत्पादों और कार्यों की पेशकश करती हैं।
2. उनके राजस्व का मुख्य स्रोत प्लेटफॉर्म पर ट्रेडिंग संबंधी गतिविधियों से उत्पन्न लेनदेन शुल्क है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1
- (b) केवल 2
- (c) 1 और 2 दोनों
- (d) न तो 1 और न ही 2

34. निम्नलिखित में से कौन-सा प्रकृति का मौलिक बल **नहीं** है?

- (a) गुरुत्वाकर्षण बल
- (b) घर्षण बल
- (c) विद्युत चुंबकीय बल
- (d) दुर्बल परमाणु बल

35. 90 किलो वजन वाला एक व्यक्ति एक लिफ्ट के अंदर है। जैसे ही लिफ्ट भूतल से ऊपर की ओर बढ़ने लगती है, तो व्यक्ति का द्रव्यमान

- (a) बढ़ता है
- (b) घट जाता है
- (c) समान रहता है
- (d) उपरोक्त में से कोई नहीं

36. प्लास्टिक से बना एक क्यूब एक तरल पूल में तैर रहा है। निम्नलिखित में से कौन-सा तरल पदार्थ क्यूब के अधिकतम भाग को तरल के ऊपर रहने की अनुमति देता है?

- (a) लवणीय जल
- (b) नमकीन घोल
- (c) पेट्रोल
- (d) सरसों का तेल

37. निम्नलिखित में से किस स्थिति में पूर्ण आंतरिक परावर्तन की परिघटना घटित होने की सर्वाधिक संभावना है?

- (a) वायु से जल में जाने वाली एकवर्णी पीली प्रकाश किरण
- (b) जल से काँच तक जाने वाली एकवर्णी लाल प्रकाश किरण
- (c) वायु से काँच तक जाने वाली एकवर्णी लाल प्रकाश किरण
- (d) जल से वायु में जाने वाली एकवर्णी पीली प्रकाश किरण

38. निम्नलिखित कथनों पर विचार कीजिये:

1. अनुदैर्घ्य तरंगें जल और स्टील दोनों में संचरण कर सकती हैं।
2. डॉप्लर प्रभाव केवल अनुप्रस्थ तरंगों में ही देखा जा सकता है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1
- (b) केवल 2
- (c) 1 और 2 दोनों
- (d) न तो 1 और न ही 2

39. निम्नलिखित कथनों पर विचार कीजिये:

1. अर्नेस्ट रदरफोर्ड ने सोने की पन्नी प्रयोग से अल्फा कण प्रकीर्णन के आधार पर परमाणु का 'प्लम-पुडिंग' मॉडल प्रस्तावित किया।
2. परमाणु के नाभिक का वास्तविक द्रव्यमान हमेशा मुक्त न्यूट्रॉन और प्रोटॉन के द्रव्यमान के योग से कम होता है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1
- (b) केवल 2
- (c) 1 और 2 दोनों
- (d) न तो 1 और न ही 2

31. With reference to Dynamic Ground Water Resource Assessment Report, 2023 consider the following statements :

1. The assessment is done periodically by the Central Ground Water Board (CGWB) in collaboration with states/UTs.
2. The 2023 report indicated a decrease in ground water recharge compared to the previous year.
3. The total annual ground water extraction exceeds the total annual ground water recharge in the country.

How many of the above statements are correct?

- (a) Only one (b) Only two  
(c) All three (d) None

32. '*Impatiens karuppusamyi*' the new species recently discovered in Kalakad Mundanthurai Tiger Reserve is a species of which of the following?

- (a) Freshwater amphibian  
(b) Freshwater fish  
(c) Flowering plant  
(d) Endemic bird in Western Ghats

33. Consider the following statements with reference to Multi-function Crypto-asset Intermediaries (MCIs):

1. MCIs are firms that offer range of crypto-based services, products and functions primarily centred around operating the trading platform.
2. Their main source of revenue is transaction fees generated from trading related activities on the platform.

Which of the statements given above is/are correct?

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

34. Which of the following is **not** a fundamental force of nature?

- (a) Gravitational force  
(b) Frictional force  
(c) Electromagnetic force  
(d) Weak nuclear force

35. A person with 90 kg body mass is inside an elevator. As the elevator starts accelerating upwards from the ground floor, the mass of the person

- (a) Increases (b) Decreases  
(c) Remains the same (d) None of the above

36. A cube made of plastic is floating in a liquid pool. Which of the following liquids allows maximum portion of the cube to remain above the liquid?

- (a) Fresh Water (b) Brine solution  
(c) Petrol (d) Mustard Oil

37. In which of the following cases is the phenomenon of total internal reflection most likely to occur?

- (a) Monochromatic yellow light beam going from air to water  
(b) Monochromatic red light beam going from water to glass  
(c) Monochromatic red light beam going from air to glass  
(d) Monochromatic yellow light beam going from water to air

38. Consider the following statements:

1. Longitudinal waves can travel through both water and steel.
2. Doppler effect can only be observed in transverse waves.

Which of the statements given above is/are correct?

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

39. Consider the following statements:

1. Ernest Rutherford proposed the 'Plum-pudding' model of the atom based on alpha particle scattering from gold foil experiment.
2. The actual mass of a nucleus of the atom is always less than the sum of the masses of the free neutrons and protons.

Which of the statements given above is/are correct?

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

40. फोटोइलेक्ट्रिक प्रभाव के संबंध में, निम्नलिखित कथनों पर विचार कीजिये:

1. इसकी खोज से प्रकाश का एक नया कणिका सिद्धांत तैयार हुआ, जिसमें प्रत्येक प्रकाश कण को प्रकाश की आवृत्ति के आधार पर ऊर्जा की निश्चित मात्रा माना गया।
2. फोटोइलेक्ट्रिक प्रभाव को समझाने के लिये आइंस्टीन को भौतिकी के नोबेल पुरस्कार से सम्मानित किया गया था।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

41. निम्नलिखित सामग्रियों पर विचार कीजिये:

1. प्रबलित कंक्रीट छत
2. मनुष्य अस्थि
3. ढलवे लोहे का शिलिका ब्लॉक
4. प्लाईवुड
5. एल्यूमिनियम शीट
6. ग्लास फाइबर प्रबलित पॉलिमर (GFRP)

उपर्युक्त में से कितनों को मिश्रित सामग्री के रूप में वर्गीकृत किया गया है?

- (a) केवल तीन (b) केवल चार  
(c) केवल पाँच (d) सभी छह

42. क्वांटम बिट के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. क्वांटम बिट में क्लासिकल बिट के विपरीत, दो अलग-अलग अवस्थाओं या कॉन्फिगरेशन की आवश्यकता नहीं होती है।
2. क्वांटम बिट्स सुपरपोजिशन अवस्था में मौजूद हो सकते हैं या अन्य क्वांटम बिट्स के साथ एंटेंगल्ड हो सकते हैं।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

43. निम्नलिखित तत्वों पर विचार कीजिये:

1. दृश्यमान प्रकाश
2. इलेक्ट्रॉन
3. एक्स-रे
4. न्यूट्रॉन

उपर्युक्त में से कितने तत्व विवर्तन की घटना प्रदर्शित करते हैं?

- (a) केवल एक (b) केवल दो  
(c) केवल तीन (d) सभी चार

44. निम्नलिखित पर विचार कीजिये:

1. लंबे अर्द्ध-आयु वाले रेडियो नाभिक अल्फा और बीटा उत्सर्जक की भांति कार्य करते हैं जो उनके प्रबंधन को आसान बनाता है।
2. कोई समस्थानिक जितना अधिक रेडियोधर्मी होता है, उसका क्षय उतना ही धीमा होता है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

45. कार्बन पृथक्करण के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. यह पादपों, मृदा, भूगर्भिक संरचनाओं एवं महासागर में कार्बन का दीर्घकालिक भंडारण है।
2. यह प्राकृतिक रूप से और मानवजनित गतिविधियों के माध्यम से होता है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

46. जब कोई प्रजाति विलुप्त हो जाती है, तो अनिवार्य रूप से उससे जुड़ी पादप एवं जंतु प्रजातियाँ भी विलुप्त हो जाती हैं। यह घटना निम्नलिखित में से किस पद को संदर्भित करती है?

- (a) कैस्केडिंग कॉलेप्स  
(b) सह-विलुप्तता  
(c) डोमिनो प्रभाव  
(d) निकेत प्रभाव

47. बार्सिलोना कन्वेंशन में समुद्री सुरक्षा के विशिष्ट पहलुओं को संबोधित करने वाले सात प्रोटोकॉल हैं। निम्नलिखित में से कौन-सा प्रोटोकॉल इस कन्वेंशन से संबद्ध नहीं है?

- (a) मत्स्य गृहण की धारणीय प्रथाओं पर प्रोटोकॉल  
(b) तेल रिसाव की स्थिति में निवारण और आपातकाल पर प्रोटोकॉल  
(c) समेकित तटीय क्षेत्र प्रबंधन पर प्रोटोकॉल  
(d) प्रदूषण के भूमि-आधारित स्रोतों पर प्रोटोकॉल



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40. With respect to photoelectric effect, consider the following statements :

1. Its discovery led to formulation of a new corpuscular theory of light treating each light particle as having fixed quantum of energy depending on frequency of light.
2. Einstein was awarded Nobel Prize for Physics for explaining the photoelectric effect.

Which of the statements given above is/are correct ?

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

41. Consider the following materials :

1. Reinforced concrete roof
2. Human bone
3. Cast iron ingot block
4. Plywood
5. Aluminum sheet
6. Glass fiber reinforced polymer (GFRP)

How many of the above are classified as composite materials ?

- (a) Only three (b) Only four  
(c) Only five (d) All six

42. Consider the following statements with reference to Qubits :

1. Quantum bit, unlike classical bit, does not need to have two distinct states or configurations.
2. Quantum bits can exist in superposition states or be entangled with other quantum bits.

Which of the statements given above is/are correct ?

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

43. Consider the following entities :

1. Visible light
2. Electrons
3. X-Rays
4. Neutron

How many of the above entities exhibit the phenomenon of diffraction ?

- (a) Only one (b) Only two  
(c) Only three (d) All four

44. Consider the following :

1. Radionuclides with long half-lives tend to be alpha and beta emitters which make their handling easier.
2. The more radioactive an isotope is, the slower it decays.

Which of the statements given above is/are correct ?

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

45. With reference to carbon sequestration, consider the following statements :

- 1 It is long term storage of carbon in plants, soils, geologic formations and ocean.
- 2 It occurs both naturally and as result of anthropogenic activities.

Which of the statements given above is/are correct ?

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

46. When a species becomes extinct, the plant and animal species associated with it in an obligatory way also become extinct.” This phenomenon refers to which of the following term ?

- (a) Cascading collapse  
(b) Co-Extinction  
(c) Domino effect  
(d) Niche effect

47. The Barcelona Convention has seven protocols addressing specific aspects of marine protection. Which of the following protocol is **not** associated with this convention ?

- (a) Protocol on sustainable fishing practices  
(b) Protocol on the prevention and emergency in case of oil spill  
(c) Protocol on integrated coastal zone management  
(d) Protocol on land-based sources of pollution



48. निम्नलिखित कथनों पर विचार कीजिये:

- वन्यजीव संरक्षण अधिनियम (1972) कपीड़क शब्द को परिभाषित करता है और उन प्रजातियों को सूचीबद्ध करता है जिन्हें कपीड़क घोषित किया जा सकता है।
- कपीड़क के रूप में वर्गीकृत प्रजातियों को वन्यजीव संरक्षण अधिनियम, 1972 की अनुसूची VI में रखा गया है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

49. पेट्रो-फसलों के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

- ये वे पौधे हैं जो पेट्रोल के पूरक के रूप में पेट्रोलियम पदार्थ का उत्पादन करते हैं।
- हाइड्रो क्रैकेबल हाइड्रोकार्बन से भरपूर उत्पाद को 'बायोक्रूड' कहा जाता है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

50. जलवायु परिवर्तन संगठनों के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

- जलवायु परिवर्तन पर संयुक्त राष्ट्र फ्रेमवर्क कन्वेंशन (UNFCCC) को वर्ष 1992 में रियो पृथ्वी शिखर सम्मेलन में अपनाया गया था।
- जलवायु परिवर्तन पर अंतर सरकारी पैनल (IPCC), विश्व मौसम विज्ञान संगठन (WMO) और संयुक्त राष्ट्र विकास कार्यक्रम (UNDP) की एक संयुक्त पहल है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

51. निम्नलिखित में से कौन-सा गुण आमतौर पर धातुओं से संबंधित नहीं है?

- (a) उच्च तापीय चालकता  
(b) उच्च विद्युत प्रतिरोधकता  
(c) उच्च तन्यता  
(d) कम विद्युत ऋणात्मकता

52. निम्नलिखित पर विचार कीजिये:

- सिरका
- बेकिंग सोडा
- मिल्क ऑफ मैग्नीशिया
- संतरे का जूस
- कार्बन डाइऑक्साइड

उपर्युक्त में से कितने, जब शुद्ध जल में घोले जाते हैं, तो परिणामी घोल के pH में कमी आएगी?

- (a) केवल दो (b) केवल तीन  
(c) केवल चार (d) सभी पाँच

53. कार्बन के अपररूप के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

- ग्रेफाइट में कार्बन-कार्बन बंध हीरे की तुलना में अधिक मजबूत होता है।
- ग्रेफाइट का गलनांक हीरे से अधिक होता है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

54. तत्त्वों के आवर्त वर्गीकरण के संबंध में निम्नलिखित कथनों पर विचार कीजिये:

- दिमित्री मेंडलीव को आधुनिक आवर्त सारणी के विकास का श्रेय दिया जाता है।
- दिमित्री मेंडलीव का आवर्त वर्गीकरण इस विचार पर आधारित था, कि तत्त्वों के भौतिक और रासायनिक गुण उनके परमाणु क्रमांक के आवर्ती फलन होते हैं।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

55. जल में ठोस पदार्थों के घुलने के संबंध में, निम्नलिखित कथनों पर विचार कीजिये:

- विलेय परमाणुओं/अणुओं के बीच के बंधों को तोड़ना एक ऊष्माशोषी प्रक्रिया है।
- विलेय और जल के अणुओं के बीच बंधन का निर्माण एक ऊष्माक्षेपी प्रक्रिया है।
- जल में किसी ठोस का स्वतःस्फूर्त विघटन हमेशा ऊष्माक्षेपी होता है।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक (b) केवल दो  
(c) सभी तीन (d) कोई भी नहीं



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48. Consider the following statements :

1. The Wildlife Protection Act (1972) defines the word Vermin and lists the species which can be declared vermin.
2. Species classified as vermin are placed in schedule VI of Wildlife Protection Act, 1972.

Which of the statements given above is/are correct ?

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

49. With reference to petro-crops, consider the following statements :

1. These are those plants that produce petroleum substances as supplementary to petrol.
2. The product rich in hydro crackable hydrocarbon is called 'biocrude'.

Which of the statements given above is/are correct ?

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

50. With reference to Climate Change Organizations, consider the following statements :

1. United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1992 at Rio Earth Summit.
2. The Intergovernmental Panel on Climate Change (IPCC) is a joint initiative of the World Meteorological Organization (WMO) and United Nations Development Programme (UNDP).

Which of the statements given above is/are correct ?

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

51. Which of the following is **not** a property generally associated with metals ?

- (a) High thermal conductivity  
(b) High electrical resistivity  
(c) High ductility  
(d) Low electronegativity

52. Consider the following :

1. Vinegar
2. Baking soda
3. Milk of Magnesia
4. Orange Juice
5. Carbon dioxide

How many of the above, when dissolved in pure water, will cause a decrease in pH of the resultant solution ?

- (a) Only two (b) Only three  
(c) Only four (d) All five

53. Consider the following statements with reference to allotropes of carbon :

1. The carbon-carbon bond in Graphite is stronger than that in diamond.
2. Graphite has a higher melting point than diamond.

Which of the statements given above is/are correct ?

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

54. With respect to periodic classification of elements, consider the following statements :

1. Dmitri Mendeleev is credited with the development of the modern periodic table.
2. Dmitri Mendeleev periodic classification was based on the idea that physical and chemical properties of elements are periodic functions of their atomic number.

Which of the statements given above is/are correct ?

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

55. Consider the following statements with respect to dissolution of solids in water :

1. Breaking of bonds between the solute atoms/ molecules is an endothermic process.
2. Formation of bonds between solute and water molecules is an exothermic process.
3. Spontaneous dissolution of a solid in water is always exothermic.

How many of the above statements are correct ?

- (a) Only one (b) Only two  
(c) All three (d) None

56. सामान्यतः उपयोग की जाने वाली प्लास्टिक पर विचार कीजिये:

1. पॉलीथीन
2. पॉलीविनाइल क्लोराइड
3. बैकेलाइट
4. टेरीलीन
5. टेफ्लॉन
6. पॉलीस्टाइरीन

उपर्युक्त में से कितने थर्मोप्लास्टिक्स की श्रेणी में आते हैं?

- (a) केवल तीन
- (b) केवल चार
- (c) केवल पाँच
- (d) सभी छह

57. रिसाव का पता लगाने में सहायता हेतु द्रवीकृत पेट्रोलियम गैस (LPG) के सिलेंडर में सामान्यतः निम्नलिखित में से क्या मिश्रित किया जाता है?

- (a) टेट्रा एथिल लेड
- (b) एथिलीन ग्लाइकोल
- (c) एथिल मरकैप्टन
- (d) मिथाइल आइसोसाइनेट

58. एक आदर्श गैस को पूरी तरह से तापरोधी कंटेनर में संपीड़ित किया जा रहा है। कंटेनर में दबाव बढ़ने से गैस गर्म हो जाती है। यहाँ निम्नलिखित में से किस प्रक्रिया का वर्णन किया जा रहा है?

- (a) समदाबीय
- (b) समआयतनिक
- (c) समतापीय
- (d) रुद्धोष्म

59. कार्बन नैनोट्यूब के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. वे फुलेरीन वर्ग से संबंधित हैं।
2. एकल दीवार वाले कार्बन नैनोट्यूब (SWNT) की पार्श्व दीवारें ग्राफीन शीट से बनी होती है।
3. कार्बन नैनोट्यूब में विद्युत चालकता अधिक होती है, लेकिन हीरे की तुलना में तापीय चालकता कम होती है।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक
- (b) केवल दो
- (c) सभी तीन
- (d) कोई भी नहीं

60. निम्नलिखित में से किस समूह के यौगिकों में ऑक्सीजन के अणु नहीं पाए जाते हैं?

- (a) अल्कोहल
- (b) ईथर
- (c) हैलोऐल्केन
- (d) कीटोन

61. स्वयं सहायता समूह बैंक लिंकेज (SHG BL) कार्यक्रम के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. यह कार्यक्रम भारतीय लघु उद्योग विकास बैंक (SIDBI) द्वारा शुरू किया गया था।
2. इस कार्यक्रम के तहत, बैंकों को SHG के लिये बचत खाता खोलने की अनुमति है।
3. ग्राहक आधार और पहुँच के मामले में यह दुनिया का सबसे बड़ा लघु वित्त कार्यक्रम है।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक
- (b) केवल दो
- (c) सभी तीन
- (d) कोई भी नहीं

62. 'बाली जात्रा' निम्नलिखित में से किस राज्य में आयोजित एक सांस्कृतिक उत्सव है:

- (a) अरुणाचल प्रदेश
- (b) असम
- (c) पश्चिम बंगाल
- (d) ओडिशा

63. S-400 ट्रायम्फ़ मिसाइल के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. यह संयुक्त राज्य अमेरिका द्वारा विकसित सबसे उन्नत टर्मिनल हाई एल्टीट्यूड एरिया डिफेंस प्रणाली है।
2. यह प्रणाली आकाश में 300 किमी. तक की ऊँचाई पर सभी प्रकार के हवाई लक्ष्यों को निशाना बना सकती है।

उपर्युक्त कथनों में से कौन सा/से सही है/हैं?

- (a) केवल 1
- (b) केवल 2
- (c) 1 और 2 दोनों
- (d) न तो 1 और न ही 2

64. हाल ही में चर्चा में रहा AURA संबंधित है:

- (a) भारत का स्वदेशी रूप से विकसित मानव रहित हवाई वाहन।
- (b) एक इजरायली रडार प्रणाली।
- (c) भारत और जापान के बीच एक रक्षा सहयोग।
- (d) भारत का स्वदेशी रूप से विकसित एयर ड्रॉप करने योग्य कंटेनर।



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56. Consider the following commonly used plastics :

- |                 |                       |
|-----------------|-----------------------|
| 1. Polyethylene | 2. Polyvinyl chloride |
| 3. Bakelite     | 4. Terylene           |
| 5. Teflon       | 6. Polystyrene        |

How many of the above fall under the category of thermoplastics ?

- |                |               |
|----------------|---------------|
| (a) Only three | (b) Only four |
| (c) Only five  | (d) All six   |

57. Which of the following is commonly added to Liquefied Petroleum Gas (LPG) cylinders to cause a foul smell and help detect leakage ?

- |                      |                       |
|----------------------|-----------------------|
| (a) Tetra ethyl lead | (b) Ethylene glycol   |
| (c) Ethyl mercaptan  | (d) Methyl isocyanate |

58. An ideal gas is being compressed in a completely thermally insulated container. The gas gets heated as the pressure rises in the box. Which of the following processes is being described here ?

- |                |               |
|----------------|---------------|
| (a) Isobaric   | (b) Isochoric |
| (c) Isothermal | (d) Adiabatic |

59. With reference to Carbon nanotubes, consider the following statements :

1. They belong to the family of fullerenes.
2. The sidewalls of single walled carbon nanotubes (SWNT) are made of graphene sheets.
3. Carbon nanotubes have higher electrical conductivity but lower thermal conductivity than diamond.

How many of the above statements are correct ?

- |               |              |
|---------------|--------------|
| (a) Only one  | (b) Only two |
| (c) All three | (d) None     |

60. Which of the following group of compounds does not contain oxygen molecule ?

- (a) Alcohols
- (b) Ethers
- (c) Haloalkanes
- (d) Ketone

61. Consider the following statements with reference to Self Help Group Bank Linkage (SHG BL) Project :

1. The programme was launched by Small industries Development Bank of India (SIDBI).
2. Under this programme, banks are allowed to open savings accounts for SHGs.
3. In terms of client base and outreach, it has become the largest microfinance program in the world.

How many of the above statements are correct ?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

62. 'Bali Jatra' is a cultural festival organised in which of the following states :

- (a) Arunachal Pradesh
- (b) Assam
- (c) West Bengal
- (d) Odisha

63. Consider the following statements with reference to S-400 Triumf Missile :

1. It is the most advanced Terminal High Altitude Area Defence system developed by the United States.
2. The system can engage all types of aerial targets at an altitude as high as 300 km up in the sky.

Which of the statements given above is/are correct ?

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

64. AURA, recently seen in news is

- (a) India's indigenously developed Unmanned aerial vehicle
- (b) An Israeli radar system
- (c) A defence collaboration between India and Japan
- (d) India's indigenously developed Air Droppable Container

65. ध्रुवीय उपग्रह प्रक्षेपण यान (PSLV) और भू-समकालिक उपग्रह प्रक्षेपण यान (GSLV) के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. PSLV ध्रुवीय कक्षा में “भू-अवलोकन” या “सुदूर संवेदी” उपग्रहों को स्थापित करता है।
2. PSLV का उपयोग कम द्रव्यमान वाले उपग्रहों को अण्डाकार जियोसिंक्रोनस ट्रांसफर ऑर्बिट (GTO) में प्रक्षेपित करने के लिये किया जाता है।
3. GSLV संचार-उपग्रहों को लगभग 36000 किलोमीटर की ऊँचाई के जियोसिंक्रोनस ट्रांसफर ऑर्बिट (GTO) में प्रक्षेपित करता है।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक (b) केवल दो  
(c) सभी तीन (d) कोई भी नहीं

66. निम्नलिखित में से कौन-सा विकल्प पुनः संयोजक DNA का वर्णन करता है?

- (a) यह विभिन्न स्रोतों से DNA के कृत्रिम संयोजन को संदर्भित करता है, जिससे एक नया DNA अनुक्रम निर्मित होता है।  
(b) यह एक पद है, जिसका उपयोग एक ही जीव के अंदर स्वाभाविक रूप से होने वाली DNA विविधताओं का वर्णन करने के लिये किया जाता है।  
(c) इसमें बिना किसी कृत्रिम संयोजन के एकल स्रोत से DNA का निष्कर्षण शामिल है।  
(d) यह DNA फिंगरप्रिंटिंग और प्रोफाइलिंग के लिये फॉरेंसिक में विशेष रूप से उपयोग की जाने वाली तकनीक है।

67. निम्नलिखित कथनों पर विचार कीजिये:

1. भारत में परमाणु ऊर्जा की उत्पादन क्षमता पवन ऊर्जा से अधिक है।
2. तमिलनाडु में कुडनकुलम परमाणु ऊर्जा संयंत्र रूस के सहयोग से स्थापित किया गया है।
3. भारत में यूरेनियम के भंडार केवल झारखंड और आंध्र प्रदेश राज्यों में पाए जाते हैं।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक (b) केवल दो  
(c) सभी तीन (d) कोई भी नहीं

68. किसी पारिस्थितिकी तंत्र में ऊर्जा प्रवाह के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. एक पारिस्थितिकी तंत्र में विभिन्न पोषी स्तरों के माध्यम से ऊर्जा प्रवाह प्रकृति में चक्रीय है।
2. एक स्थिर पारिस्थितिकी तंत्र के सबसे ऊपरी पोषी स्तर पर उपलब्ध उपयोग हेतु ऊर्जा सभी पोषी स्तरों में सदैव सबसे कम होती है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

69. पारिस्थितिकीय अनुक्रमण के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. झूम या स्थानान्तरित कृषि से प्रभावित भूमि पर वनस्पति और वन का पुनर्जनन प्राथमिक अनुक्रमण का एक उदाहरण है।
2. प्राथमिक अनुक्रमण की तुलना में द्वितीयक अनुक्रमण अपेक्षाकृत तीव्र होता है।
3. कीस्टोन प्रजातियाँ वे हैं, जो भूमि के बंजर क्षेत्र पर पारिस्थितिकीय अनुक्रमण की प्रक्रिया शुरू करती हैं।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक (b) केवल दो  
(c) सभी तीन (d) कोई भी नहीं

70. जलीय पारिस्थितिक तंत्र के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. प्लैंकटन की गति करने की क्षमता सीमित होती है और ये ज्वार और धाराओं द्वारा प्रवाहमान होते हैं।
2. प्लैंकटन पौधे और प्राणी जगत दोनों के भाग हैं।
3. प्लैंकटन सागरीय पारिस्थितिकी तंत्र और पृथ्वी के वायुमंडल में महत्वपूर्ण मात्रा में ऑक्सीजन का योगदान करते हैं।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक  
(b) केवल दो  
(c) सभी तीन  
(d) कोई भी नहीं

65. Consider the following statements with reference to Polar Satellite Launch Vehicle (PSLV) and Geosynchronous Satellite Launch Vehicle (GSLV):

1. PSLV delivers the “earth-observation” or “remote-sensing” satellites in polar orbit.
2. The PSLV is used to launch satellites of lower mass to the elliptical Geosynchronous Transfer Orbit (GTO).
3. GSLV delivers communication-satellites to the Geosynchronous Transfer Orbit (GTO) of about 36000 km altitude.

How many of the above statements are correct?

- (a) Only one (b) Only two  
(c) All three (d) None

66. Which among the following describes the recombinant DNA?

- (a) It refers to the artificial combination of DNA from different sources, creating a new DNA sequence.  
(b) It is a term used to describe naturally occurring DNA variations within a single organism.  
(c) It involves the extraction of DNA from a single source without any artificial combination.  
(d) It is a technique exclusively used in forensics for DNA fingerprinting and profiling.

67. Consider the following statements:

1. The generation capacity of nuclear energy in India exceeds that of wind energy.
2. Kudankulam nuclear power plant in Tamil Nadu is set up with Russian collaboration.
3. Uranium deposits in India are only found in states of Jharkhand and Andhra Pradesh.

How many of the above statements are correct?

- (a) Only one (b) Only two  
(c) All three (d) None

68. Consider the following statements with reference to energy flow in an ecosystem:

1. Energy flow through various trophic levels in an ecosystem is cyclic in nature.
2. The usable energy available at the topmost trophic level of a stable ecosystem is always the least among all trophic levels.

Which of the statements given above is/are correct?

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

69. Consider the following statements with reference to ecological succession:

1. Regeneration of vegetation and forest on lands affected by Jhum or shifting cultivation is an example of primary succession.
2. Secondary succession is relatively faster as compared to primary succession.
3. Keystone species are those who begin the process of ecological succession on a barren piece of land.

How many of the above statements are correct?

- (a) Only one (b) Only two  
(c) All three (d) None

70. With reference to aquatic ecosystems, consider the following statements:

1. Planktons have limited locomotory abilities and are carried around by tides and currents.
2. Planktons are part of both plant and animal kingdom.
3. Planktons contribute significant amounts of oxygen to the marine ecosystem and the earth's atmosphere.

How many of the above statements are correct?

- (a) Only one  
(b) Only two  
(c) All three  
(d) None



71. निम्नलिखित में से कौन-सा स्व-स्थाने संरक्षण का उदाहरण नहीं है?

- (a) वानस्पतिक उद्यान (b) राष्ट्रीय उद्यान  
(c) आरक्षित वन (d) समुद्री अभयारण्य

72. निम्नलिखित मानदंडों पर विचार कीजिये:

1. प्रजाति की भौगोलिक सीमा
2. समय के साथ प्रजाति की संख्या के आकार में कमी
3. जंगल में विलुप्त होने की मात्रात्मक विश्लेषण-आधारित संभावना
4. संख्या का छोटा आकार और गिरावट
5. किसी विशेष प्रजाति के लिये समर्पित संरक्षण प्रयासों की संख्या
6. वैश्विक बीज भंडार में प्रजाति संरक्षण की स्थिति

यह निर्धारित करने के लिये उपर्युक्त में से कितने मानदंडों पर विचार किया जाता है, कि कोई प्रजाति IUCN लाल सूची की संकटग्रस्त श्रेणी से संबंधित है?

- (a) केवल तीन (b) केवल चार  
(c) केवल पाँच (d) सभी छह

73. निम्नलिखित पर विचार कीजिये:

1. डॉल्फिन में लंबी “चोंच” और शंकु के आकार के दाँत होते हैं।
2. डॉल्फिन पोरपोइज की तुलना में अधिक मुखर होती हैं।
3. डॉल्फिन का झुका हुआ या घुमावदार पृष्ठीय पंख पोरपोइज के त्रिकोणीय पृष्ठीय पंख से भिन्न होता है।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक  
(b) केवल दो  
(c) सभी तीन  
(d) कोई भी नहीं

74. ‘जस्ट ट्रांजिशन एंड मिटिगेशन वर्क प्रोग्राम’ निम्नलिखित में से किसके तहत स्थापित किया जाना है:

- (a) UNFCCC के COP-26  
(b) UNFCCC के COP-27  
(c) UNFCCC के COP-21  
(d) UNFCCC के COP-22

75. ब्रेकथ्रु एजेंडा रिपोर्ट 2023 के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. यह संयुक्त राष्ट्र पर्यावरण कार्यक्रम, अंतर्राष्ट्रीय नवीकरणीय ऊर्जा एजेंसी और यूनाइटेड नेशंस क्लाइमेट चेंज हाई-लेवल चैंपियंस के बीच एक वार्षिक सहयोग है।
2. इसका मुख्य उद्देश्य ग्रीनहाउस गैस उत्सर्जन में कमी लाने के लिये विश्वव्यापी सहयोग बढ़ाना है।

उपर्युक्त कथनों में से कौन सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

76. यह पूर्वी हिमालय की तलहटी में तोर्सा नदी के तट पर स्थित है। काजीरंगा राष्ट्रीय उद्यान के बाद यहाँ भारतीय एक सींग वाले गैंडे की सबसे बड़ी आबादी है। वर्णित विशेषताओं को समाहित करने वाले राष्ट्रीय उद्यान की पहचान कीजिये:

- (a) जलदापाड़ा राष्ट्रीय उद्यान  
(b) गोरुमारा राष्ट्रीय उद्यान  
(c) मानस राष्ट्रीय उद्यान  
(d) नेओरा घाटी राष्ट्रीय उद्यान

77. अचानकमार-अमरकंटक बायोस्फीयर रिज़र्व के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. यह महादेव पहाड़ी शृंखलाओं से लेकर विन्ध्य और सतपुड़ा पर्वत शृंखलाओं के मिलन-बिंदु तक त्रिकोणीय आकार में फैला हुआ है।
2. यह छत्तीसगढ़, मध्य प्रदेश और महाराष्ट्र की सीमा पर स्थित है।
3. यह एक पवित्र स्थान है, जहाँ से नर्मदा, जोहिला और सोन नदियाँ निकलती हैं।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक (b) केवल दो  
(c) सभी तीन (d) कोई भी नहीं

78. निम्नलिखित में से कौन-सी भारत की आक्रामक विदेशज प्रजाति नहीं है?

- (a) जलकुंभी (b) एलीफैंट ग्रास  
(c) कॉमन कार्प (d) शीशम



71. Which of the following is **not** an example of in-situ conservation?

- (a) Botanical garden (b) National Park  
(c) Reserved forest (d) Marine Sanctuary

72. Consider the following criteria:

1. Geographic range of species population
2. Population size reduction over time
3. Quantitative analysis-based probability of extinction in the wild
4. Small Population size and decline
5. Number of dedicated conservation efforts for a particular species
6. Species conservation status in Global Seed Vault

How many of the above criteria are considered to determine if a species belongs to the IUCN Red List Threatened Category?

- (a) Only three (b) Only four  
(c) Only five (d) All six

73. Consider the following:

1. Dolphins have prominent, elongated “beaks” and cone-shaped teeth.
2. Dolphins are more talkative than porpoises.
3. The dolphin’s hooked or curved dorsal fin differs from the porpoise’s triangular dorsal fin.

How many of the above statements are correct?

- (a) Only one  
(b) Only two  
(c) All three  
(d) None

74. The ‘Just Transition and mitigation Work programme’ is to be set up under which of the following?

- (a) COP-26 of UNFCCC  
(b) COP-27 of UNFCCC  
(c) COP-21 of UNFCCC  
(d) COP-22 of UNFCCC

75. With reference to Breakthrough Agenda Report 2023, consider the following statements:

1. It is an annual collaboration between the United Nations Environment Programme, the International Renewable Energy Agency, and the United Nations Climate Change High-Level Champions.
2. Its focus is on strengthening international cooperation to accelerate the reduction of global greenhouse gas emissions.

Which of the statements given above is/are correct?

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

76. It is located on the banks of Torsa River at the foothills of the Eastern Himalayas. It has the largest population of the Indian one-horned rhinoceros after Kaziranga National Park. Identify the national park:

- (a) Jaldapara national park  
(b) Gorumara national park  
(c) Manas national park  
(d) Neora valley national park

77. Consider the following statements with reference to Achanakmar-Amarkantak Biosphere Reserve:

1. It is spread from Mahadeo hill ranges to the junction of Vindhyan and Satpura hill ranges in a triangular shape.
2. It is located at the trijunction of Chhattisgarh, Madhya Pradesh and Maharashtra.
3. It is a holy place from where the Narmada, Johilla and Sone rivers emerge.

How many of the above statements are correct?

- (a) Only one (b) Only two  
(c) All three (d) None

78. Which of the following is **not** an invasive alien species in India?

- (a) Water Hyacinth (b) Elephant Grass  
(c) Common Carp (d) Rosewood

79. भारत में वन्यजीव अभयारण्यों और राष्ट्रीय उद्यानों के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. राज्य सरकारों को कुछ क्षेत्रों को वन्यजीव अभयारण्य या राष्ट्रीय उद्यान के रूप में घोषित करने का अधिकार है।
2. वन्यजीव अभयारण्यों और राष्ट्रीय उद्यानों दोनों में पशुओं को चराने की अनुमति है।
3. पर्यावरण (संरक्षण) अधिनियम, 1986 कुछ क्षेत्रों को राष्ट्रीय उद्यान घोषित करने का अधिकार देता है।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक (b) केवल दो  
(c) सभी तीन (d) कोई भी नहीं

80. ऑरंगुटान के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. ये भारत के पूर्वोत्तर भागों में अपने प्राकृतिक आवास में पाए जाते हैं।
2. तपानुली ऑरंगुटान सभी ग्रेट एप्स प्रजातियों में सर्वाधिक लुप्तप्राय प्रजाति है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

81. शैलेश नायक समिति का प्राथमिक अधिदेश था:

- (a) तटीय नियमन क्षेत्र (CRZ) अधिसूचना, 2009 की समीक्षा करना  
(b) तटीय क्षेत्रों में आर्थिक विकास को बढ़ावा देना  
(c) CRZ विनियमों के कार्यान्वयन में सुधार करना  
(d) CRZ अधिसूचना, 2011 से संबंधित मुद्दों की जाँच करना

82. 'शुद्ध शून्य ऊर्जा भवनों' के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. ये ऐसे भवन हैं, जो अपने द्वारा उपयोग की गई ऊर्जा का उत्पादन करने के लिये नवीकरणीय स्रोतों का उपयोग करते हैं।
2. ठंडी जलवायु क्षेत्रों में, दक्षिण मुखी इमारतें और उस तरफ बनी विशाल खिड़कियाँ निष्क्रिय सौर लाभ के माध्यम से ऊष्मा उत्पन्न कर सकती हैं।

उपर्युक्त कथनों में से कौन सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

83. पर्यावरण प्रभाव आकलन (EIA) के किस चरण में परियोजना के संभावित प्रभावों जैसे- प्रभाव का क्षेत्र, शमन की संभावनाएँ, निगरानी और EIA के लिये आवश्यक विवरण का स्तर निर्धारण आदि की पहचान की जाती है?

- (a) स्कोपिंग  
(b) प्रभाव आकलन  
(c) सार्वजनिक भागीदारी योजना  
(d) पर्यावरणीय प्रभाव विवरण

84. राष्ट्रीय उन्नत ऊर्जा दक्षता मिशन के संदर्भ में, निम्नलिखित पर विचार कीजिये:

1. यह नवीन और नवीकरणीय ऊर्जा मंत्रालय द्वारा शासित है।
2. यह ऊर्जा संरक्षण अधिनियम, 2001 पर आधारित है।
3. सूक्ष्म, लघु और मध्यम उद्यमों में ऊर्जा दक्षता बढ़ाने के लिये UNNATEE मोबाइल एप्लिकेशन लॉन्च किया गया है।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक  
(b) केवल दो  
(c) सभी तीन  
(d) कोई भी नहीं

85. नेशनल फ्रेमवर्क फॉर क्लाइमेट सर्विसेज (NFCS) के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. भारत NFCS लागू करने वाला विश्व का पहला देश बन गया।
2. केंद्रीय प्रदूषण नियंत्रण बोर्ड NFCS के लिये नोडल एजेंसी है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1  
(b) केवल 2  
(c) 1 और 2 दोनों  
(d) न तो 1 और न ही 2

79. Consider the following statements with reference to Wildlife sanctuaries and National Parks in India :

1. State Governments are authorised to declare certain areas as wildlife sanctuary or as National Park.
2. Grazing of livestock is permitted in both Wildlife sanctuaries and National Parks.
3. The Environment (Protection) Act of 1986 grants the authority to declare certain areas as National Parks.

How many of the above statements are correct ?

- (a) Only one                      (b) Only two  
(c) All three                      (d) None

80. With reference to orangutans, consider the following statements :

1. They can be found in their natural habitat in Northeastern parts of India.
2. The Tapanuli orangutan is one of the most endangered among all great apes.

Which of the statements given above is/are correct ?

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

81. The primary mandate of the Shailesh Nayak Committee was to

- (a) Review the Coastal Regulation Zone (CRZ) Notification, 2009  
(b) Promote economic development in coastal areas  
(c) Improve enforcement of CRZ regulations  
(d) Examine issues related to the CRZ Notification, 2011

82. With reference to 'Net zero energy buildings', consider the following statements :

1. It is one that relies on renewable sources to produce as much energy as it uses.
2. In cold climates regions, south-facing buildings with large expanses of windows on that side can produce heat through passive solar gain.

Which of the statements given above is/are correct ?

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

83. In which step of the Environment Impact Assessment (EIA) are the project's potential impacts identified and zone of impact, mitigation possibilities, monitoring and the level of detail needed for the EIA determined ?

- (a) Scoping  
(b) Impact Assessment  
(c) Public Participation Plan  
(d) Environmental Impact Statement

84. Consider the following with reference to National Mission for Enhanced Energy Efficiency :

1. It is governed by Ministry of New and Renewable Energy.
2. It is based on Energy Conservation Act, 2001.
3. UNNATEE mobile application is launched for increasing energy efficiency in Micro, Small and Medium Enterprises.

How many of the above statements are correct ?

- (a) Only one  
(b) Only two  
(c) All three  
(d) None

85. With reference to National Framework for Climate Services (NFCS), consider the following statements:

1. India became the first country in the world to implement NFCS.
2. Central Pollution Control Board is the nodal agency for the NFCS.

Which of the statements given above is/are correct?

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

86. राष्ट्रीय हरित अधिकरण के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. इसकी स्थापना वर्ष 2008 में हुई थी।
2. भारत एकमात्र ऐसा देश है, जिसके पास पर्यावरणीय विवादों को सुलझाने के लिये एक विशेष अधिकरण है।
3. भारत के सेवानिवृत्त मुख्य न्यायाधीश अधिकरण के पदेन अध्यक्ष होते हैं।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक (b) केवल दो  
(c) सभी तीन (d) कोई भी नहीं

87. निम्नलिखित पर विचार कीजिये:

1. बायोरेमेडिएशन
2. गाद निकालना एवं अनावश्यक पादपों को हटाना
3. बायो-फेंसिंग लगाना
4. जलग्रहण क्षेत्र का उपचार

उपर्युक्त में से कितनी गतिविधियाँ जलीय पारिस्थितिकी प्रणालियों के संरक्षण के लिये राष्ट्रीय योजना का हिस्सा हैं?

- (a) केवल एक (b) केवल दो  
(c) केवल तीन (d) सभी चार

88. भारतीय जैव सुरक्षा ज्ञान पोर्टल के संदर्भ में, निम्नलिखित पर विचार कीजिये:

1. इसे वर्ष 2022 में एक वेब-आधारित पोर्टल के रूप में लॉन्च किया गया था।
2. संस्थागत जैव सुरक्षा समिति को आनुवंशिक रूप से संशोधित जीवों (GMOs) के आयात, निर्यात और विनिमय के आवेदन पर निर्णय लेने का अधिकार सौंपा गया है।

उपर्युक्त कथनों में से कौन सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

89. निम्नलिखित पर विचार कीजिये:

1. कृट्टनाड समुद्र स्तर से नीचे की भूमि पर कृषि की प्रणाली
2. कोरापुट पारंपरिक कृषि
3. पंपोर केसर कृषि प्रणाली

उपर्युक्त में से कितनी संयुक्त राष्ट्र के खाद्य और कृषि संगठन (FAO) द्वारा मान्यता प्राप्त विश्व स्तर पर महत्वपूर्ण कृषि विरासत प्रणाली में शामिल हैं?

- (a) केवल एक (b) केवल दो  
(c) सभी तीन (d) कोई भी नहीं

90. निम्नलिखित में से UNFCCC के किस कॉन्फ्रेंस ऑफ पार्टीज में लॉस एंड डैमेज फंड की स्थापना की गई थी?

- (a) पेरिस समझौता  
(b) क्योटो प्रोटोकॉल  
(c) वारसॉ शिखर सम्मेलन  
(d) कोपेनहेगन सम्मेलन

91. ग्लोफॉलिंग पार्टनरशिप प्रोजेक्ट के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. इसका उद्देश्य आक्रामक जलीय प्रजातियों के स्थानांतरण को कम करना है।
2. यह पहल संयुक्त राष्ट्र पर्यावरण कार्यक्रम (UNEP) और अंतर्राष्ट्रीय समुद्री संगठन (IMO) के बीच एक सहयोग है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

92. हाल ही में चर्चा में रहे कुलसेकरपट्टिनम के संबंध में निम्नलिखित कथनों पर विचार कीजिये:

1. यह केरल का एक शहर है, जिसे छोटे उपग्रह प्रक्षेपण यानों को लॉन्च करने के लिये एक स्पेसपोर्ट के रूप में विकसित किया जा रहा है।
2. यह एक प्राचीन बंदरगाह था, जो कोल्लम, चेरन और पांड्य बंदरगाहों के अस्तित्व के समकालीन था।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

93. हाल ही में भौगोलिक उपदर्शन प्रमाणन (GI टैग) प्राप्त करने वाले तीन स्वदेशी उत्पाद याक चुरपी, खामती चावल और तांगसा वस्त्र किस राज्य/केंद्र शासित प्रदेश से संबंधित हैं?

- (a) तमिलनाडु (b) लद्दाख  
(c) मध्य प्रदेश (d) अरुणाचल प्रदेश



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86. With reference to National Green Tribunal, consider the following statements :

1. It was established in 2008.
2. India is the only country which have a special tribunal for resolving environmental disputes.
3. Retired Chief Justice of India is the ex-officio chairperson of the tribunal.

How many of the above statements are correct ?

- (a) Only one                      (b) Only two  
(c) All three                      (d) None

87. Consider the following :

1. Bioremediation
2. Desilting & Deweeding
3. Bio-fencing
4. Catchment area treatment

How many of the above activities are part of the National Plan for Conservation of Aquatic Eco-systems ?

- (a) Only one                      (b) Only two  
(c) Only three                      (d) All four

88. With reference to Indian biosafety knowledge portal, consider the following :

1. It was launched in 2022 as a web-based portal.
2. Institutional biosafety committee has been delegated authority to take decision on application of import, export and exchange of Genetically Modified Organisms (GMOs).

Which of the statements given above is/are correct ?

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

89. Consider the following :

1. Kuttanad Below Sea Level Farming System
2. Koraput traditional agriculture
3. Pampore saffron cultivation system

How many of the above are Globally Important Agriculture Heritage system recognised by Food and Agriculture Organization (FAO) of the United Nations ?

- (a) Only one                      (b) Only two  
(c) All three                      (d) None

90. Which among the following conference of parties of UNFCCC established the Loss and Damage Fund ?

- (a) Paris Agreement  
(b) Kyoto Protocol  
(c) Warsaw Summit  
(d) Copenhagen Conference

91. Consider the following statements with reference to GloFouling Partnership Project :

1. It aims to minimize the transfer of invasive aquatic species.
2. The initiative is a collaboration between the United Nations Environment Programme (UNEP) and International Maritime Organization (IMO).

Which of the above statements is/are correct ?

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

92. Consider the following statements regarding Kulasekarapattinam, that was recently in news :

1. It is a town in Kerala, being developed as a spaceport to launch small satellite launch vehicles.
2. It was an ancient port that was contemporaneous to the existence of Kollam, Cheran, and Pandyan Ports.

Which of the statements given above is/are correct ?

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

93. Three indigenous products Yak Churpi, Khamti rice, and Tangsa textile that received the Geographical Indication (GI) tag recently belong to which state UT ?

- (a) Tamil Nadu                      (b) Ladakh  
(c) Madhya Pradesh                      (d) Arunachal Pradesh



94. भारत के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. देश में संरक्षित क्षेत्र का दायरा लगातार बढ़ रहा है।
2. भारत में बाघ, एशियाई शेर, एक सींग वाला गैंडा, एशियाई हाथियों जैसी प्रजातियों की आबादी कम हो गई है।
3. दक्षिण एशिया में सर्वाधिक रामसर स्थल भारत में हैं।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक (b) केवल दो  
(c) सभी तीन (d) कोई भी नहीं

95. निम्नलिखित कथनों पर विचार कीजिये:

1. तंजानिया एक पश्चिमी अफ्रीकी देश है जो अपने विशाल वन्य क्षेत्रों के लिये जाना जाता है।
2. सेरेनेटी नेशनल पार्क और किलिमंजारो नेशनल पार्क तंजानिया में स्थित हैं।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

96. राष्ट्रीय अपराध रिकॉर्ड ब्यूरो (NCRB) के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. यह भारतीय और विदेशी अपराधियों के फिंगरप्रिंट रिकॉर्ड के लिये “राष्ट्रीय भंडारण” के रूप में कार्य करता है।
2. यह देश में अन्य दांडिक अपराधों के साथ-साथ भारत में पर्यावरणीय अपराधों की भी एक सूची रखता है।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1 (b) केवल 2  
(c) 1 और 2 दोनों (d) न तो 1 और न ही 2

97. अनूप बरनवाल बनाम भारत संघ, 2023 मामला, जो हाल ही में जन-समाचारों में रहा है, किससे संबंधित है:

- (a) मुख्य चुनाव आयुक्त एवं चुनाव आयुक्तों का चयन  
(b) भारत में समलैंगिक विवाह का अधिकार  
(c) माल एवं सेवा कर (GST) कार्यान्वयन की संवैधानिक वैधता  
(d) जनजातीय क्षेत्रों में भूमि अधिग्रहण और पुनर्वास नीतियाँ

98. निम्नलिखित में से कौन-से देश खाड़ी सहयोग परिषद (GCC) के सदस्य हैं?

- (a) सऊदी अरब, कुवैत, ओमान, यमन और इराक  
(b) सऊदी अरब, बहरीन, कतर, ओमान और संयुक्त अरब अमीरात  
(c) ईरान, इराक, सऊदी अरब, कतर और यमन  
(d) कुवैत, संयुक्त अरब अमीरात, ईरान, बहरीन और जॉर्डन

99. भारत में राजद्रोह कानून के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. राजद्रोह के लिये धारा 124A वर्ष 1870 में सर जेम्स स्टीफन द्वारा पेश किये गए एक संशोधन द्वारा जोड़ी गई थी।
2. महात्मा गांधी, लोकमान्य तिलक और जोगेंद्र चंद्र बोस जैसे नेताओं पर ब्रिटिश शासन के विरुद्ध उनकी टिप्पणियों के लिये राजद्रोह कानून के तहत मुकदमा चलाया गया था।

उपर्युक्त कथनों में से कौन-सा/से सही है/हैं?

- (a) केवल 1  
(b) केवल 2  
(c) 1 और 2 दोनों  
(d) न तो 1 और न ही 2

100. ‘दूरसंचार अधिनियम, 2023’ के संदर्भ में, निम्नलिखित कथनों पर विचार कीजिये:

1. इस अधिनियम ने भारतीय दूरसंचार नियामक प्राधिकरण अधिनियम, 1997 को प्रतिस्थापित किया है।
2. यूनिवर्सल सर्विस ऑब्लिवेशन फंड का नाम बदलकर डिजिटल भारत निधि फंड की स्थापना की गई।
3. इसने संचार विवाद निपटान और अपीलीय प्राधिकरण (TDSAT) की स्थापना की है।

उपर्युक्त में से कितने कथन सही हैं?

- (a) केवल एक  
(b) केवल दो  
(c) सभी तीन  
(d) कोई भी नहीं



94. Consider the following statements with reference to India :

1. The Protected Area coverage in the country has been steadily increasing.
2. Population of species like Tiger, Asiatic Lion, Greater one Horned Rhinoceros, Asian elephants have decreased in India.
3. India has the largest number of Ramsar sites in South Asia.

How many of the above statements are correct?

- (a) Only one                      (b) Only two  
(c) All three                      (d) None

95. Consider the following statements :

1. Tanzania is a west African country known for its vast wilderness areas.
2. Serengeti National Park and Kilimanjaro National Park are in Tanzania.

Which of the statements given above is/are correct?

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

96. Consider the following statements with reference to National Crime Records Bureau (NCRB) :

1. It acts as a “national warehouse” for the fingerprint records of Indian and foreign criminals.
2. It maintains a list of environmental crimes in India along with other criminal offences in the country.

Which of the above statements is/are correct?

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

97. Anoop Baranwal vs Union of India, 2023 case, recently in news, is associated with :

- (a) The selection of the Chief Election Commissioner and the Election Commissioners  
(b) Right to have same sex marriage in India  
(c) Constitutional validity of Goods and Services Tax (GST) implementation  
(d) Land acquisition and rehabilitation policies in tribal areas

98. Which of the following countries are members of the Gulf Cooperation Council (GCC) ?

- (a) Saudi Arabia, Kuwait, Oman, Yemen, and Iraq  
(b) Saudi Arabia, Bahrain, Qatar, Oman, and the United Arab Emirates  
(c) Iran, Iraq, Saudi Arabia, Qatar, and Yemen  
(d) Kuwait, United Arab Emirates, Iran, Bahrain, and Jordan

99. Consider the following statements with reference to Sedition law in India :

1. Section 124A was inserted in 1870 by an amendment introduced by Sir James Stephen for sedition.
2. Leaders like Mahatma Gandhi, Lokmanya Tilak, and Jogendra Chandra Bose were tried under sedition law for their comments on the British rule.

Which of the statements given above is/are correct?

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

100. Consider the following statements with reference to ‘The Telecommunications Act, 2023’ :

1. The act has replaced the Telecom Regulatory Authority of India Act, 1997.
2. Digital Bharat Nidhi fund was established by renaming the Universal Service Obligation Fund.
3. It has established the Telecom Disputes Settlement and Appellate Tribunal (TDSAT).

How many of the above statements are correct?

- (a) Only one  
(b) Only two  
(c) All three  
(d) None



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TEST BOOKLET SERIES

**Test Code:**  
**P1/P2/P3-2419**

**TEST BOOKLET**  
**GENERAL STUDIES**  
**TEST – 19**

**C**

**Time Allowed : Two Hours**

**Maximum Marks : 200**

**INSTRUCTIONS**

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET *DOES NOT* HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS, ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. ENCODE CLEARLY THE TEST BOOKLET SERIES CODE **A, B, C** OR **D** AS THE CASE MAY BE IN THE APPROPRIATE PLACE IN THE ANSWER SHEET.
3. You have to enter your Roll Number on the Test Booklet in the Box provided alongside this line. *DO NOT* write *anything else* on the Test Booklet.
4. This Test Booklet contains 100 items (questions). Each question is printed both in **Hindi** and **English**. Each item comprises four responses (answers). You will select the response which you want to mark on the Answer Sheet. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose **ONLY ONE** response for each item.
5. You have to mark all your responses **ONLY** on the separate Answer Sheet provided. See directions in the Answer sheet.
6. All items carry equal marks.
7. Before you proceed to mark in the Answer Sheet the response to various items in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per instructions sent to you with your admission certificate.
8. After you have completed filling in all your responses on the Answer Sheet and examination has concluded, you should hand over to the Invigilator *only the Answer Sheet*. You are permitted to take away with you the Test Booklet.
9. Sheets for rough work are appended in the Test Booklet at the end.
10. **Penalty for wrong answers:**  
**THERE WILL BE PENALTY FOR WRONG ANSWERS MARKED BY A CANDIDATE IN THE OBJECTIVE TYPE QUESTION PAPERS.**
  - (i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **One-Third** of the marks assigned to that question will be deducted as penalty.
  - (ii) If a candidate gives more than one answer, it will be treated as a **wrong answer** even if one of the given answers happens to be correct and there will be same penalty as above to that question.
  - (iii) If a question is left blank, i.e., no answer is given by the candidate, there will be no **penalty** for that question.

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**Test Code:  
P1/P2/P3-2419**

(English Version)

**ANSWER & EXPLANATION  
GENERAL STUDIES**

**TEST – 19**

**C**

**ANSWERS**

Q. No.	Answers	Q. No.	Answers	Q. No.	Answers	Q. No.	Answers
1	(d)	26	(b)	51	(b)	76	(a)
2	(c)	27	(a)	52	(b)	77	(a)
3	(d)	28	(a)	53	(a)	78	(d)
4	(b)	29	(b)	54	(a)	79	(a)
5	(a)	30	(d)	55	(b)	80	(b)
6	(d)	31	(a)	56	(b)	81	(d)
7	(b)	32	(c)	57	(c)	82	(c)
8	(a)	33	(c)	58	(d)	83	(a)
9	(a)	34	(b)	59	(b)	84	(b)
10	(b)	35	(c)	60	(c)	85	(d)
11	(d)	36	(b)	61	(b)	86	(d)
12	(b)	37	(d)	62	(d)	87	(d)
13	(a)	38	(a)	63	(d)	88	(b)
14	(b)	39	(b)	64	(a)	89	(c)
15	(d)	40	(c)	65	(c)	90	(c)
16	(a)	41	(b)	66	(a)	91	(a)
17	(b)	42	(b)	67	(a)	92	(b)
18	(a)	43	(d)	68	(b)	93	(d)
19	(b)	44	(a)	69	(a)	94	(b)
20	(b)	45	(c)	70	(c)	95	(b)
21	(c)	46	(b)	71	(a)	96	(c)
22	(a)	47	(a)	72	(b)	97	(a)
23	(b)	48	(d)	73	(c)	98	(b)
24	(a)	49	(c)	74	(b)	99	(c)
25	(b)	50	(a)	75	(b)	100	(a)

1. (d)

**Explanation:**

- The **International Tropical Timber Council (ITTO)** is an **intergovernmental organization** promoting the sustainable management and conservation of tropical forests and the expansion and diversification of international trade in tropical timber from sustainably managed and legally harvested forests.
- ITTO was established under the **International Tropical Timber Agreement 1983 (ITTA 1983)**, negotiated under the auspices of the **United Nations Conference on Trade and Development**. Hence, statement (1) is **NOT correct**.
- It has **75 countries**, including India. Hence, statement (3) is **NOT correct**.
- Its members **manage about 80% of the world's tropical forests** and are responsible for 90% of the global tropical timber trade.
- Headquarters: **Yokohama, Japan**. Hence, statement (2) is **NOT correct**.

2. (c)

**Explanation:**

- The **national tiger census** is done **every four years** by the **National Tiger Conservation Authority (NTCA)** in partnership with state forest departments, conservation NGOs, and the **Wildlife Institute of India (WII)**. Hence, statement (1) is **correct**.
- The census uses a **double sampling method** based on ground-based surveys and images from camera-traps.
- Population has grown by 200 from 2018 to 2022. The **current tiger population in India is 3,167**, up from 2,967 in 2018. The growth rate slowed to 6.7% in the four years from 2018 to 2022, from around 33% during 2014-2018. Hence, statement (3) is **correct**.
- **Tiger Reserves in India:**
  - **Total Number: 55** according to NTCA. (**Dholpur – Karauli Tiger Reserve**, Rajasthan is the latest)
  - **Largest:** Nagarjunasagar Srisailem Tiger Reserve, Andhra Pradesh on the basis of core area.
  - **Smallest:** **Orang tiger reserve in Assam** on the basis of core area. Hence, statement (2) is **correct**.

3. (d)

**Explanation:**

- **Wildlife Crime Control Bureau (WCCB)** is a **statutory** multi-disciplinary body established by the Government of India under the Ministry of Environment and Forests, to combat organized wildlife crime in the country.
- The Wildlife Crime Control Bureau (WCCB) conducts various operations, including:
  - **Operation Save Kurma:** This operation focuses on the conservation and protection of **turtles and tortoises**.
  - **Thunderbird:** Concentrate mainly on **illegal trade in species** such as Tigers and other Asian big cats, Bears, Pangolins, Reptiles, Red Sanders, Sea-cucumber and sea horses
  - **LESKNOW:** Towards the illegal wildlife trade in lesser known species.
  - **BIRBIL:** Illegal trade in all **Birds and cat** species.
  - **SOFT GOLD:** Towards curbing the menace of illegal wildlife trade in Tibetan **antelope (Shahtoosh)**. Hence, option (d) is **correct**.
- The **WCCB** also conducts other operations, including:
  - Capacity building and training programs for police and forest officials
  - Collecting and compiling intelligence on organized wildlife crime activities
  - Disseminating intelligence to other law enforcement agencies and state agencies for immediate action
  - Establishing a centralized Wildlife Crime data bank
- The **WCCB** was established on June 6, **2007** and has its **headquarters in New Delhi**. It also has five regional offices, three sub-regional offices, and five border units.

4. (b)

**Explanation:**

- The **restructured National Bamboo Mission (NBM)** was launched during 2018-19 as a **Centrally Sponsored Scheme (CSS)**.
- NBM **mainly focuses on the development of the complete value chain of Bamboo sector** to link growers with consumers starting from planting material, plantation, creation of facilities for collection, aggregation, processing, marketing, micro, small & medium enterprises, skilled manpower and brand building initiative in a cluster approach mode.

- The **Ministry of Agriculture & Farmers Welfare** is the **Nodal Ministry**. Hence, **option (b) is correct**.
- The bamboo industry is witnessing a phase change by the opening of multiple avenues of resource utilization.
- **Removal of Bamboo from 'Tree' Category:** The **Indian Forest Act 1927** was amended in **2017** to remove bamboo for the category of trees. As a result, anyone can undertake cultivation and business in bamboo and its products without the need of a felling and transit permission.

**5. (a)**

**Explanation:**

- **The Himalayan Wolf (*Canis lupus chanco*)**, a prominent lupine predator found across the Himalayas has been assessed **for the first time** in the International Union for Conservation of Nature (IUCN)'s Red List. Hence, **statement (1) is correct**.
- The Himalayan Wolf is a mysterious lupine predator that inhabits the high elevations of the Himalayas.
- It is found in parts of China, Nepal, India, and Bhutan and typically lives in alpine meadows and grasslands at elevations of 10,000 to 18,000 feet. Hence, **statement (2) is NOT correct**.
- **Conservation Status:**
  - IUCN Status: **Vulnerable**. Hence, **statement (3) is NOT correct**.
  - Wildlife Protection Act, 1972: **Schedule I**
- The IUCN Red List Assessment has highlighted an ongoing reduction in the area, extent, and quality of habitat for Himalayan wolves.

**6. (d)**

**Explanation:**

- The **Uttarakhand mandua**, a finger **millet** grown in Garhwal and Kumaon that is part of the staple diet in many parts of the State, was among the products granted GI tags.
- Similarly, **jhangora**, a home-grown millet commonly cultivated in the rain-fed areas of the **Himalayas** in Uttarakhand, got a tag. Hence, **option (d) is correct**.

**7. (b)**

**Explanation:**

- The **Wild Life (Protection) Act, of 1972** provides a legal framework for the protection of various species

of wild animals and plants, management of their habitats, regulation, and control of trade in wild animals, plants, and products made from them.

- **Wildlife (Protection) Amendment Act, 2022:** The number of schedules has been reduced to **four from earlier six**.
  - **Schedule I** contains animal species enjoying the **highest level of protection**. Hence, **pair (1) is correctly matched**.
  - **Schedule II** for animal species subject to a **lesser degree of protection**. Hence, **pair (2) is correctly matched**.
  - **Schedule III** for **protected plant species**. Hence, **pair (3) is NOT correctly matched**.
  - **Schedule IV** for scheduled specimens under **CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora)**. Hence, **pair (4) is NOT correctly matched**.

**8. (a)**

**Explanation:**

- Metamorphosis is a biological phenomenon characterized by a significant and **abrupt change in the form and structure of an organism during its development**.
- Metamorphosis typically involves a transformation from one developmental stage to another, and during this process, there is usually **no direct competition between adults and juveniles** for resources. Instead, metamorphosis often serves to minimize competition between different life stages of the same species. Hence, **option (a) is correct**.
- Metamorphosis can be an adaptive strategy that increases the chances of survival for the species. By having distinct life stages with different ecological niches or resource requirements, more individuals may successfully reach sexual maturity.
- **Frogs and butterflies** are classic examples of organisms that undergo metamorphosis. In frogs, the transition involves a change from tadpole to adult frog, while in butterflies, it involves the transformation from **caterpillar to pupa** and then to the **adult butterfly**.
- Metamorphosis often involves a drastic reorganization of an organism's body structure, including changes in morphology, physiology, and behavior. The transformation is typically profound and results in the organism adopting the specific characteristics of its adult stage.



### 9. (a)

#### Explanation:

- **Mutualism:** In mutualistic interactions, **both participating species benefit from the relationship.** In this case, the flower benefits from the bee's pollination services, aiding in the transfer of pollen and reproduction, while the bee benefits by receiving nectar, a sugary substance that serves as a food source for the insect. The biological interaction described in the line where a flower is pollinated by a bee, and in return, it provides the insect with nectar is known as mutualism. **Hence, option (a) is correct.**
- **Parasitism:** In parasitic interactions, one organism benefits at the expense of the other. This relationship is characterized by the parasite deriving nutrients from the host, often causing harm to the host organism.
- **Commensalism:** Commensalism involves a relationship where one organism benefits, and the other is neither significantly harmed nor benefited. There is usually a one-sided advantage, but it is not a requirement for the other organism's survival.
- **Competition:** In competitive interactions, organisms compete for limited resources, and the presence of one may negatively affect the other as they strive to access the same resources.

### 10. (b)

#### Explanation:

- **Mycorrhizae** literally translates to **“fungus-root.”** Mycorrhiza defines a (generally) mutually beneficial relationship between the root of a plant and a fungus that colonizes the plant root.
- In many plants, mycorrhiza are fungi that grow inside the plant's roots, or on the surfaces of the roots.
- The plant and the fungus have a mutually beneficial relationship, where the **fungus facilitates water and nutrient uptake in the plant**, and the plant provides **food and nutrients created by photosynthesis to the fungus.** This exchange is a significant factor in nutrient cycles and the ecology, evolution, and physiology of plants. **Hence, option (b) is correct.**

### 11. (d)

#### Explanation:

- **Insectivorous** plants grow in **humid areas**, that is, under **ample sunlight and moisture.** Insectivorous

plants are grown easily in **nitrogen deficient soil** and this type of soil serves as an important **habitat** for these plants. **Hence, statement (1) and (2) is NOT correct.**

- This nitrogen deficiency is also one of the reasons these plants trap and digest the insects to absorb the nutrients. The insectivorous plants are also known as the Carnivorous plants, like that of carnivorous animals.
- Examples - **VENUS FLY TRAP, TROPICAL PITCHER PLANT, BLABBERWORTS**

### 12. (b)

#### Explanation:

- Xylem and phloem are two essential **vascular tissues** in plants, responsible for the transport of various substances.
- **Xylem** functions to **transport water and minerals** to support **photosynthesis and transpiration**, while also providing **structural support to the plant.**
- It consists of tubular tissues that lack cross walls, presenting a star-shaped appearance. Located in the center of the vascular bundle, xylem occurs in **roots, stems, and leaves.**
- The movement of sap in xylem is **unidirectional**, moving upward from the roots towards the stems and leaves.
- This upward flow is powered by negative pressure, and the **mature xylem is dead tissue**, featuring lignin fibers that make it waterproof and resistant to collapsing under pressure.
- On the other hand, **phloem** is responsible for transporting organic molecules, such as **sugars, amino acids, plant hormones, and mRNA.**
- It consists of elongated tubular tissues with walls containing thin **sieve tubes.** Located on the outer part of the vascular bundle, phloem occurs in stems and leaves and eventually in roots and fruits.
- The movement of sap in phloem is **bidirectional**, allowing fluid to move up or down based on the plant's needs. **Turgor pressure from osmosis powers the flow of sap.** Unlike xylem, phloem is **living tissue**, although the sieve tube cells lack nuclei and contain minimal cytoplasm. The various components of phloem include sieve tubes, companion cells, bast fibers, phloem fibers, intermediary cells, and phloem parenchyma. **Hence, statement (1) and (2) are correct and statement (3) is NOT correct.**



**13. (a)**
**Explanation:**

- **The pulmonary vein carries oxygenated blood from the lungs to the heart:** The pulmonary vein carries oxygenated blood from the lungs to the left atrium of the heart. **Hence, statement (1) is correct.**
- **The pulmonary artery carries deoxygenated blood from the heart to the lungs:** The pulmonary artery is responsible for carrying deoxygenated blood from the right ventricle of the heart to the lungs for oxygenation. **Hence, statement (2) is correct.**
- The tricuspid valve is located between **the right atrium and the right ventricle**. The bicuspid or mitral valve is located between the left atrium and the left ventricle. **Hence, statement (3) is NOT correct.**
- The sinoatrial node is another very important part of the heart. It is a group of cells in the wall of the right atrium of the heart – and it is what keeps the heart pumping!
- The cells in the **sinoatrial node** produce small electrical impulses in a regular rhythm. These impulses are what drive the contractions of the four chambers of the heart.

**14. (b)**
**Explanation:**

- An example of an organism that exhibits bioluminescence is the **firefly** (Lampyridae).
- Fireflies are well-known for their ability to produce light, particularly during their mating rituals.
- The light is produced through a chemical reaction involving the enzyme **luciferase** and a molecule called **luciferin** in the presence of oxygen. This bioluminescent display is used by fireflies to communicate with each other during courtship.

**Hence, option (b) is correct.**

**15. (d)**
**Explanation:**

- Some microbes may become associated with other organisms and fix nitrogen. The host organism may be a lower plant or higher plant. The host organism and the nitrogen fixing microbes establish a special relationship called symbiosis and this results in symbiotic nitrogen fixation.

**Some symbiotic nitrogen fixing organisms**

System	Symbionts
Lichens	Cyanobacteria and <b>Fungus</b> .
Bryophyte	Cyanobacteria and Anthoceros.
Pteridophyte	Cyanobacteria and <b>Azolla</b> .
Gymnosperm	Cyanobacteria and <b>Cycus</b> .
Angiosperms	<b>Legumes</b> and Rhizobium.
Angiosperms	Non leguminous and actinomycets (Such as alnus, Myrica, Purshia).
Angiosperm	Brazilian grass (Digitaria), Corn and Azospirillum.

**Hence, option (d) is correct.**

**16. (a)**
**Explanation:**

- Monoecious plants are those which have separate male and female flowers on the same plant. In monoecious plants, both male and female flowers are present in the same “house” or plant.
- **Cucurbits**, which include plants like **cucumber, pumpkin, and watermelon, are monoecious. Coconuts are also monoecious.** The male and female flowers are borne on the same inflorescence, which is a type of flower cluster. The male flowers are small and yellow while the female flowers are larger and green. Once pollinated, the female flowers develop into the coconut fruit.
- Other examples of monoecious plants are Apple, Pear, cherry, roses etc.
- If the plant is dioecious, the male and female blossoms appear on separate plants.
- Example of some dioecious plants:
  - ☛ **Spinach**
  - ☛ **Asparagus**
  - ☛ **Kiwifruit**
  - ☛ **Papaya (Normally)**

**Hence, option (a) is correct.**

**17. (b)**
**Explanation:**

- **Abscisic Acid (ABA):** It is a plant hormone that plays a crucial role in various physiological processes, particularly in stress responses. ABA is involved in **seed dormancy, control of stomatal aperture, and responses to environmental stresses like drought.**

- **Gibberellins:** These are plant hormones that regulate various developmental processes, including **stem elongation, seed germination, and flowering**. Gibberellins are essential for promoting plant growth and development.
- **Cytokinins:** Cytokinins are plant hormones that **promote cell division** and influence various aspects of plant growth and development. They are involved in processes such as **cell differentiation, shoot and root development, and delay of senescence (aging) in plants**.

Hence, option (b) is correct.

#### 18. (a)

**Explanation:**

- Viruses that infect bacteria are called **bacteriophages**. They inject their genetic material into bacteria, hijacking the host's cellular machinery to replicate and produce more viruses. **Hence, statement (2) is correct.**
- Viruses can have **either RNA or DNA** as their genetic material. Some viruses have RNA genomes, and others have DNA genomes. The genetic material can be single-stranded or double-stranded. **Hence, statement (3) is NOT correct.**
- A virus, without a host cell, cannot replicate on its own and is therefore not alive. **Hence, statement (1) is NOT correct.**

#### 19. (b)

**Explanation:**

- Recently, the **Ministry of Commerce & Industry** has released the 5<sup>th</sup> edition of "**Logistics Ease Across Different State (LEADS) 2023**" report, which serves as a guide for stakeholders in the Logistics Sector by providing strategic insights.
- The LEADS is an indigenous data-driven index to assess logistics infrastructure, services, and human resources across all 36 States and UTs.
- LEADS continues to act as a guiding and bridging mechanism for the identification of interventions enhancing logistics efficiency at State/UTs.
- LEADS aims to guide stakeholders in the logistics sector by offering strategic insights and fostering healthy competition among states and union territories to improve their logistics performance.

- LEADS was conceived on the lines of the Logistics Performance Index of World Bank in 2018 and has evolved over time.
- The report evaluates logistics performance based on **three key pillars**,
  - Logistics **Infrastructure**
  - Logistics **Services**
  - Operating and Regulatory Environment

Hence, option (b) is correct.

#### 20. (b)

**Explanation:**

- **Ministry of Mines** has launched the **National Geoscience Data Repository (NGDR) Portal**. NGDR is a comprehensive online platform for accessing, sharing, and analysing geospatial information across the nation.
- The NGDR initiative, spearheaded by the **Geological Survey of India (GSI) and Bhaskaracharya Institute of Space Applications and Geoinformatics (BISAG-N)** represents a significant leap forward in democratizing critical geoscience data, empowering stakeholders across industries and academia with unprecedented access to invaluable resources. **Hence, statement (1) is correct.**
- The **Geological Survey of India (GSI)** was set up in **1851** primarily to find coal deposits for the Railways. **Hence, statement (2) is correct.**
- Over the years, GSI has not only grown into a repository of geo-science information required in various fields in the country but has also attained the status of a geo-scientific organisation of international repute. Its main functions relate to creating and updating of national geoscientific information and mineral resource assessment.
- GSI, **headquartered in Kolkata**, has six regional offices located in Lucknow, Jaipur, Nagpur, Hyderabad, Shillong and Kolkata and state unit offices in almost all states of the country. GSI is an attached office of the Ministry of Mines. **Hence, statement (3) is NOT correct.**
- **Bhaskaracharya National Institute for Space Applications and Geo-informatics [BISAG (N)]** is an Autonomous Scientific Society registered under the Societies Registration Act, 1860 under the MeitY, Government of India to undertake technology

development & management, research & development, facilitate National & International cooperation, capacity building and support technology transfer & entrepreneurship development in area of geo-spatial technology.

### 21. (c)

#### Explanation:

- The term “**anarcho-capitalism**” has recently gained attention, particularly with the recent electoral victory of Javier Milei, a self-proclaimed anarcho-capitalist, in the presidential race in Argentina.
- This political philosophy advocates for the abolition of the state, proposing that **private companies manage law and order in a free market**.
- Anarcho-capitalism, political philosophy and political-economic theory that advocates the voluntary exchange of goods and services in a society broadly regulated by the market rather than by the state.
- The term anarcho-capitalism was **coined by Murray Rothbard**, a leading figure in the American libertarian movement from the 1950s.
- Anarcho-capitalists assert that private companies in a free market can efficiently provide policing and legal services.
- The philosophy contends that like private sectors offering superior products and services, private policing and legal systems can outperform state-monopolized counterparts.

Hence, option (c) is correct.

### 22. (a)

#### Explanation:

- NASA’s **Lucy spacecraft** recently discovered **asteroid Dinkinesh** and its unanticipated satellite.
- The International Astronomical Union approved the name “**Selam**” which means “peace” in the Ethiopian language Amharic, for Dinkinesh’s moon.
- Selam itself is a ‘contact binary’ – that is, it is made of **two smaller objects touching each other**.
- Lucy is the nickname for a remarkably complete (40 percent intact) hominin skeleton found by American paleoanthropologist Donald Johanson at the fossil site Hadar in Ethiopia on Nov. 24, 1974, and dated to 3.2 million years ago.
- Dinkinesh is the Ethiopian name for the fossil nicknamed ‘**Lucy**’.

- The fossil Selam, discovered by Zeresenay Alemseged in 2000 in Dikika, Ethiopia, belonged to a 3-year-old girl of the same species as Lucy; though the “baby” actually lived more than 100,000 years before Lucy.

Hence, option (a) is correct.

### 23. (b)

#### Explanation:

- Scientists from **Department of Atomic Energy** and M/s. IDRS Labs Pvt. Ltd. Bengaluru joined hands to develop AKTOCYTE tablets.
- Experts from **Bhabha Atomic Research Centre, Mumbai; Tata Memorial Hospital, Mumbai; Advanced Centre for Training Research and Education in Cancer, Navi Mumbai** collaborated with the IDRS Labs with a primary aim of minimizing the side effects of radiotherapy. **Hence, statement (1) is NOT correct.**
- The AKTOCYTE tablets have shown remarkable results, particularly in **pelvic cancer patients** suffering from **radiotherapy-induced Cystitis (Blood in urine)**. Patients treated with AKTOCYTE tablets demonstrated an extraordinary recovery, eliminating the need for surgical removal of the urinary bladder.
- The tablets, designed as an adjuvant to cancer **radiotherapy**, regenerative nutraceutical, immunomodulator, and antioxidant, mark a significant advancement in cancer care.
- AKTOCYTE has received approval from the **Food Safety and Standards Authority of India (FSSAI), operating under the Ministry of Health & Family Welfare**, Government of India. **Hence, statement (2) is correct.**
- This regulatory clearance emphasizes the safety and compliance of AKTOCYTE tablets, providing assurance to both healthcare professionals and patients about its efficacy and quality.

### 24. (a)

#### Explanation:

- The **Sahitya Akademi award** is the **second-highest** literary honour by the Government of India, **after the Jnanpith award**. **Hence, statement (1) is NOT correct.**
- Sahitya Akademi award established in **1954**, is a literary honour that is conferred **annually** by Sahitya Akademi, India’s National Academy of letters.

- Akademi gives **24 awards** annually to literary works in the languages it has recognized and an equal number of awards to literary translations from and into the languages of India.
- Book/work eligible for the award must be an outstanding contribution to the language and literature to which it belongs.
- Besides the 22 languages enumerated in the Constitution of India, the Sahitya Akademi has recognised **English and Rajasthani as languages** in which its programme may be implemented. **Hence, statement (3) is NOT correct.**
- The author must be of **Indian Nationality**. **Hence, statement (2) is correct.**
- Over the years, the Akademi has introduced other awards such as the Bhasha Samman, Yuva Sahityakar and Bal Sahitya Puraskar.

#### 25. (b)

##### Explanation:

- The Gaganyaan Programme envisages undertaking the demonstration of human spaceflight to Low Earth Orbit (LEO) in the short-term and will lay the foundation for a sustained Indian human space exploration programme in the long run.
- As part of this programme, two unmanned missions and one manned mission are approved by Government of India (GoI).
- The major new technologies required for Gaganyaan programme are as follows:
  - Human rated launch vehicle
  - Crew escape systems
  - Habitable orbital module
  - Life support system
  - Crew selection and training and associated crew management activities
- ISRO has been using Cryogenic engine and liquid fuel propelled engines in its rocket launches, especially Geosynchronous Satellite Launch Vehicle Mark II (GSLV Mk II), to launch communication satellites in geo transfer orbit using cryogenic third stage.
- Initially Russian GK supplied cryogenic stages were used. Later cryogenic stage was indigenously developed and inducted in Jan 2014 from GSLV D5 onwards.

- This operational fourth generation launch vehicle is a **three stage vehicle with four liquid strap-ons**.
- ISRO's **Vikas engines are liquid fuel propelled** rocket engines used in different launch vehicles.

**Hence, option (b) is correct.**

#### 26. (b)

##### Explanation:

- India has ratified **two core conventions** of the International Labour Organization on child labour in 2017.
  - **The Minimum Age Convention (1973) - No. 138:** This convention requires States party to set a minimum age under which no one shall be admitted to employment or work in any occupation. The minimum age should not be less than the age of completion of compulsory schooling and, in any case, **not less than 15 years**. However, developing countries may initially specify a minimum age of 14 years.
  - **The Worst Forms of Child Labour Convention (1999)-No. 182:** This convention calls for the prohibition and elimination of the worst forms of child labour, including slavery, forced labour and trafficking; the use of children in armed conflict; the use of a child for prostitution, pornography and in illicit activities (such as drug trafficking); and hazardous work that is likely to harm the health, safety or morals of children. **Hence, statement (1) is correct.**
- Sustainable Development **Goal 8** aims to promote **inclusive and sustainable economic growth, full and productive employment and decent work for all**. As this relates to children, Target 8.7 of this goal aims to eliminate the worst forms of child labour, including the recruitment and use of child soldiers, as well as to end all forms of child labour by **2025**. **Hence, statement (2) is correct.**
- **Article 24** of the Indian Constitution pertains to the prohibition of child labour. It prohibits the employment of **children below the age of 14 years** in any factory, mine, or hazardous occupation. The intention is to prevent exploitation, safeguard the health and development of children, and ensure their access to education. **Hence, statement (3) is NOT correct.**



27. (a)

**Explanation:**

- Recently, the **World Meteorological Organisation (WMO)** has published a report titled- **The Global Climate 2011-2020: A Decade of Acceleration**, concerning the alarming acceleration of climate change and its multifaceted impacts across the planet. **Hence, statement (1) is NOT correct.**
- **Key Highlights of the report include:**
  - **Temperature Trends:** The decade 2011-2020 emerged as the **warmest on record** for both land and ocean. **Hence, statement (2) is correct.**
  - Global mean temperature soared to  $1.10 \pm 0.12^\circ\text{C}$  above the 1850-1900 average, with each decade since the 1990s surpassing previous ones in warmth.
  - **Greenhouse Gas Emissions:** Atmospheric concentrations of major greenhouse gases (GHG) continued to rise, especially CO<sub>2</sub>, reaching 413.2 ppm in 2020.
  - **Oceanic Changes:** Ocean warming rates accelerated significantly, with 90% of accumulated heat stored in the ocean. Warming rates doubled in the upper 2000m depth from 2006-2020, impacting marine ecosystems.
  - **Glacier and Ice Sheet Loss:** Glaciers globally thinned by about 1 meter/year between 2011 and 2020. Greenland and Antarctic ice sheets lost 38% more ice compared to 2001-2010, contributing significantly to rising sea levels.
  - **Arctic Sea Ice Decline:** Arctic Sea ice continued its decline during the summer melt season, with a mean seasonal minimum extent 30% below the 1981-2010 average.
  - **Ozone Hole and Successes:** The Antarctic ozone hole diminished in the 2011-2020 period, credited to successful international action under the Montreal Protocol. **Hence, statement (3) is NOT correct.**

28. (a)

**Explanation:**

- Recently, the 28<sup>th</sup> Conference of Parties (COP-28) took place in Dubai, UAE, with representatives from 197 countries presenting their initiatives to curb global warming and engaging in discussions on future climate actions.

- The COP28 agreement calls upon countries to contribute to **tripling of global installed capacity of renewable energy** and **doubling of annual improvements in energy efficiency**. Together, these two measures have the potential to avoid emissions of about 7 billion tonnes of carbon dioxide equivalent **between now and 2030**, more than all the net result of all the other climate actions being currently taken. **Hence, statement (1) is NOT correct.**
- A decision to set up a **Loss and Damage Fund** had been taken last year in Sharm el-Shaikh but it had not been created, and no money had been promised. **COP28 operationalised this fund** on the opening day of the conference, and several countries, including hosts UAE, made funding commitments. By the end of the conference, commitments worth about US\$ 800 million had been made. The money is meant to provide financial help to countries trying to recover from climate-induced disasters. **Hence, statement (2) is correct.**
- Methane is the most widespread greenhouse gas apart from CO<sub>2</sub>, accounting for nearly 25 per cent of all emissions. It is also about 80 times more potent than CO<sub>2</sub> in causing global warming.
- Several countries, including India, are extremely opposed to any mandate to cut methane emissions, mainly because one of the major sources happens to be agriculture and livestock.
- Possibly in deference to the concerns of such countries, the agreement does not mention any targets for methane emission cuts for the year 2030.
- Although a group of about 100 countries had made a voluntary commitment, in **Glasgow in 2021**, to reduce their methane emissions by **30% by 2030**. **Hence, statement (3) is NOT correct.**

29. (b)

**Explanation:**

- **Global Cooling Pledge** launched at the First Global Conference on Synergies between the 2030 Agenda and Paris Agreement, the Cool Coalition was **assembled by UNEP** with the belief that a unified effort of governments, cities, businesses, and civil society that share the objective of advancing, sustainable cooling will be more effective in bringing about change than acting alone.
- The **Cool Coalition and COP28 UAE Presidency** launched the **Global Cooling Pledge at COP28**, with



nearly 70 government signatories and more than 50 supporters from international organizations, international finance institutions and industry. **Hence, statement (1) is correct.**

- The Global Cooling Pledge marks the world's first collective effort to improve energy efficiency and reduce emissions from the sector.
- The Pledge aims to **reduce global cooling-related emissions by 68 per cent by 2050**, improve energy efficiency of cooling technologies by **50 per cent by 2030** and to increase access to sustainable cooling for the most vulnerable – all of which is needed to keep the 1.5°C goal in reach. **Hence, statement (2) is correct.**
- India is **yet** to sign the Pledge. **Hence, statement (3) is NOT correct.**

### 30. (d)

**Explanation:**

- The **United Nations Educational, Scientific and Cultural Organization (UNESCO)** in its recent report on the Ethics of Climate Engineering has emphasized the importance of including vulnerable, neglected, and marginalized individuals, along with women, youth, and indigenous people, as crucial stakeholders in policy decisions regarding the contentious field of climate engineering.
- **Climate engineering** refers to the deliberate **modification of Earth's climate** to counteract or mitigate the effects of climate change.
- This can involve various techniques aimed at either reflecting sunlight away from the Earth or removing greenhouse gasses from the atmosphere.
- Climate engineering is classified into **two groups of techniques**:
  - **Carbon Dioxide Removal (CDR)**: It removes and stores the emitted carbon dioxide from the atmosphere. CDR includes:
    - ◆ Direct air capture
    - ◆ land-use management through **afforestation / reforestation**
    - ◆ **Sequestering carbon dioxide (CO<sub>2</sub>)** produced by **biomass** that may also be used as an energy source increases the uptake of CO<sub>2</sub> by the ocean and enhances natural weathering processes that remove CO<sub>2</sub> from the atmosphere.

○ **Solar Radiation Modification (SRM)**: SRM approaches include increasing the surface reflectivity of the planet.

- ◆ **Painting structures with reflective paints**
- ◆ **Planting crops with high reflectivity**
- ◆ **Enhancing the reflectivity of marine clouds**
- ◆ **Removing infrared-absorbing clouds**
- ◆ **Injecting aerosols into the lower stratosphere** to mimic the cooling induced by volcanic eruptions and lowering the solar radiation reaching the earth by placing reflectors or shields in space are some more SRM techniques.

**Hence, option (d) is correct.**

### 31. (a)

**Explanation:**

- The Union **Minister of Jal Shakti**, Shri Gajendra Singh Shekhawat recently released the Dynamic Ground Water Resource Assessment Report for the entire country for the year 2023.
- The assessment was carried out jointly by **Central Ground Water Board (CGWB)** and States/UTs, which can be used for taking suitable interventions by various stake-holders. **Hence, statement (1) is correct.**
- As per the 2023 assessment report, the total annual ground water recharge for the entire country is 449.08 billion cubic meters (BCM), marking **an increase of 11.48 BCM** compared to the previous year (2022) and annual ground water extraction for the entire country is 241.34 BCM. **Hence, statement (2) is NOT correct.**
- Further, out of the total 6553 assessment units in the country, 736 units have been categorized as 'Over-exploited'.
- The key findings of the 2023 assessment include:
  - Increase in ground water recharge,
  - Improvement in ground water conditions in 226 assessment units in the country compared with 2022 assessment data.
  - Total annual ground water recharge for entire country is 449.08 billion cubic meters (BCM), while extraction is 241.34 BCM. **Hence, statement (3) is NOT correct.**
  - Stage of ground water extraction stands at 59.23%.
  - Out of total 6553 assessment units, 4793 units categorized as '**Safe**'.

32. (c)

**Explanation:**

- The researchers of **Botanical Survey of India (BSI)** have discovered a new species of plant from **Kalakad Mundanthurai Tiger Reserve, Tamil Nadu**. The plant has been named '**Impatiens karuppusamyi**'.
- The species is named after Dr. S Karuppusamy for his significant contributions to the taxonomy of south Indian angiosperms.
- Researchers collected the specimens of a lithophytic *Impatiens* during a botanical exploration in Kalakad Mundanthurai Tiger Reserve. Upon examination, it was found that the species was different from all the known species of *Impatiens*.
- *Impatiens* is a genus of more than 1,000 species of **flowering plants**, widely distributed throughout the Northern Hemisphere and the tropics.
- There are more than 1000 species of *Impatiens* worldwide, of which more than 280 are found in India. It is distributed widely throughout tropical Africa, Madagascar, India, Sri Lanka and China.
- Earlier, **three new species** of *Impatiens*—*Impatiensachudanandanii*, *I. danii*, and *I. shailajae*, were discovered from Thiruvananthapuram and Idukki districts of Kerala.

Hence, option (c) is correct.

33. (c)

**Explanation:**

- Recently, the **Financial Stability Board (FSB)**'s latest report on crypto-asset intermediaries sought measures to enhance cross-border cooperation and information sharing among local authorities. This is to effectively regulate and address gaps in Multi-function Crypto-asset Intermediaries (MCIs) operating globally.
- Multi-function Crypto-asset Intermediaries (MCIs) are individual firms, or groups of affiliated firms that offer a range of crypto-based services, products and functions which primarily revolve around operating the trading platform. **Hence, statement (1) is correct.**
- Examples include **Binance, Bitfinex and Coinbase**.
- The primary source of revenue for these platforms are the transaction fees generated from trading-related activities. **Hence, statement (2) is correct.**

- These MCIs may also derive revenue from operating a blockchain infrastructure for which they may collect transaction validation fees.
- The report notes that MCI vulnerabilities are not so different from those in traditional finance: leverage, liquidity mismatch, technology and operational vulnerabilities and interconnections.
- It warns that certain combinations of functions could exacerbate these vulnerabilities. For example, the engagement of MCIs in proprietary trading, market making on their own trading venues, and the lending and borrowing of crypto-assets could lead to higher leverage.

34. (b)

**Explanation:**

- There are four basic forces in Physics that are referred to as **Fundamental forces** —**gravitational, electromagnetic, strong, and weak nuclear force**— that govern how objects or particles interact and how certain particles decay. **Hence, option (b) is correct.**
- All the known forces of nature can be traced to these fundamental forces.
- The following four criteria are used for characterization of fundamental forces:
  - the types of particles that experience the force,
  - the relative strength of the force,
  - the range over which the force is effective, and
  - the nature of the particles that mediate the force.
- Gravitation and electromagnetism were recognized long before the discovery of the strong and weak forces because their effects on ordinary objects are readily observed.
- The gravitational force, described systematically by Isaac Newton in the 17<sup>th</sup> century, acts between all objects having mass. It causes apples to fall from trees and determines the orbits of the planets around the Sun.
- The electromagnetic force, given scientific definition by James Clerk Maxwell in the 19<sup>th</sup> century, is responsible for the repulsion of like and the attraction of unlike electric charges. It also explains the chemical behaviour of matter and the properties of light.
- The strong and weak nuclear forces were discovered by physicists in the 20<sup>th</sup> century when they finally probed into the core of the atom.

35. (c)

**Explanation:**

- **Mass is the quantitative measure of inertia**, a fundamental property of all matter.
- It is, in effect, the resistance that a body of matter offers to a change in its speed or position upon the application of a force.
- **The greater the mass of a body, the smaller the change produced by an applied force.**
- The unit of mass in the International System of Units (SI) is the kilogram.
- Weight, though related to mass, nonetheless differs from the latter. Weight essentially constitutes the force exerted on matter by the gravitational attraction of Earth, and so it varies slightly from place to place.
- In contrast, **mass remains constant regardless of its location** under ordinary circumstances. A satellite launched into space, for example, weighs increasingly less the farther it travels away from Earth. Its mass, however, stays the same.

**Hence, option (c) is correct.**

36. (b)

**Explanation:**

- Objects float in a liquid when the upthrust on them is equal to the weight of the object. The upthrust is equal to the weight of the liquid displaced by the object.
- The **weight of the liquid displaced** is equal to the **product of density of liquid and the volume of submerged portion of the object.**
- The more the density of the liquid the more will be the upthrust for the same submerged volume.
- For a given object to float the upthrust needed remains the same, which is equal to its weight. So, the **liquid with higher density will need less submerged volume** of the object to keep it floating and thus offer maximum portion of the object to remain above the liquid.
- Of the given options, **Brine solution** (salt + water) has the **highest density. Hence, option (b) is correct.**

37. (d)

**Explanation:**

- **Total internal reflection** is complete reflection of a ray of light within a medium such as water or glass from the surrounding surfaces back into the medium.

- The phenomenon occurs if the **angle of incidence is greater than a certain limiting angle**, called the critical angle.
- Total Internal reflection takes place at the boundary between two transparent media when a ray of light in a **medium of higher index of refraction** approaches the **other medium** at an angle of incidence greater than the critical angle.
- The increasing order of refractive index for the media:  
**Air < Water < Glass**
- The only pair with light going from higher refractive index to lower is that of **'Monochromatic yellow light beam going from water to air'** Hence, option (d) is correct.

38. (a)

**Explanation:**

- **Longitudinal waves** are waves consisting of a **periodic disturbance or vibration** that takes place in the same direction as the advance of the wave.
- A coiled spring that is compressed at one end and then released experiences a wave of compression that travels its length. Such wave is an example of Longitudinal wave.
- Another example is **sound**. Sound moving through air also compresses and rarefies the gas in the direction of travel of the sound wave as they vibrate back and forth.
- Sound can travel through **air, water, steel** etc. The speed of sound varies in different mediums. **Hence, statement (1) is correct.**
- **Doppler effect** is the apparent difference between the frequency at which sound or light waves leave a source and that at which they reach an observer, caused by relative motion of the observer and the wave source.
- An example of the **Doppler effect** is as one approaches a blowing horn, the perceived pitch is higher until the horn is reached and then becomes lower as the horn is passed. Sound is a longitudinal wave. **Hence, statement (2) is NOT correct.**
- Similarly, the light from a star, observed from the Earth, shifts toward the red end of the spectrum (lower frequency or longer wavelength) if the Earth and star are receding from each other and toward the violet (higher frequency or shorter wavelength) if they are approaching each other. **Light is a transverse wave.**

39. (b)

**Explanation:**

- The Rutherford model supplanted the “plum-pudding” atomic model of English physicist Sir J.J. Thomson, in which the electrons were embedded in a positively charged atom like plums in a pudding. **Hence, statement (1) is NOT correct.**
- **Rutherford model** is the description of the structure of atoms proposed (1911) by the physicist Ernest Rutherford.
- The model described the atom as a tiny, dense, positively charged core called a nucleus, in which nearly all the mass is concentrated, around which the light, negative constituents, called electrons, circulate at some distance, much like planets revolving around the Sun.
- The nucleus was postulated as small and dense to account for the scattering of alpha particles from thin gold foil.
- **The actual mass of a nucleus is always less than the sum of the masses of the free neutrons and protons that constitute it**, the difference being the mass equivalent of the energy of formation of the nucleus from its constituents. **Hence, statement (2) is correct.**
- This difference is known as the mass defect and is a measure of the total binding energy (and, hence, the stability) of the nucleus.

40. (c)

**Explanation:**

- Photoelectric effect is the phenomenon in which electrically charged particles are released from or within a material when it absorbs **electromagnetic radiation**.
- The effect is often defined as the ejection of electrons from a metal plate when light falls on it. In a broader definition, **the radiant energy may be infrared, visible, or ultraviolet light, X-rays, or gamma rays**; the material may be a solid, liquid, or gas; and the released particles may be ions (electrically charged atoms or molecules) as well as electrons.
- Consideration of the ‘unexpected’ behaviours associated with the phenomenon led Albert Einstein to formulate in 1905 a **new corpuscular theory of light** in which each particle of light, or photon, **contains a fixed amount of energy**, or quantum, that depends on the light’s frequency. **Hence, statement (1) is correct.**

- Einstein was finally awarded the **Nobel Prize for Physics in 1921** for explaining the **photoelectric effect**. **Hence, statement (2) is correct.**

41. (b)

**Explanation:**

- A composite material is a combination of two materials with different physical and chemical properties. When they are combined, they create a material that is specialized to do a certain job, for instance, to become stronger, lighter, or resistant to electricity. They can also improve strength and stiffness.
- **Reinforced concrete roof** is the composite material most used in construction at the same time, it is a combination of various substances: cement, sand, gravel, water and rebar.
- **Human bone** is a composite material that occurs in nature. Bones are made up of a bone matrix reinforced by **collagen fibers**, a protein that gives it its natural flexibility and also contains **calcium phosphate**, which helps maintain the strength of the bone structure.
- Plywood is a board of thin sheets of wood glued to each other with their fibers in transverse orientation, with synthetic resins, pressure and heat.
- **Glass-Fiber Reinforced Plastic (GFRP)** is a composite material formed by a plastic or resin matrix, reinforced with glass fibers.
- **Cast iron ingot and Aluminum sheet** are examples of **pure metal items** and are not composite materials. **Hence, option (b) is correct.**

42. (b)

**Explanation:**

- A digital computer both stores and processes information using bits, which can be either 0 or 1.
- Physically, a bit can be anything that has two distinct configurations: one represented by “0”, and the other represented by “1”.
- In modern computing and communications, bits are represented by the absence or presence of an electrical signal, encoding “0” and “1” respectively.
- A **quantum bit** is any bit made from a quantum system, like an electron or photon.
- Just like classical bits, a quantum bit must have two distinct states: one representing “0” and one representing “1”. **Hence, statement (1) is NOT correct.**



- Unlike a classical bit, a quantum bit can also exist in superposition states, be subjected to incompatible measurements, and even be entangled with other quantum bits.
- Having the ability to harness the powers of superposition, interference and entanglement makes qubits fundamentally different and much more powerful than classical bits. **Hence, statement (2) is correct.**
- To build quantum computers and other quantum information technologies we need quantum objects that will act as qubits. Scientists are developing techniques to harness and control many physical systems to act as qubits.

#### 43. (d)

##### Explanation:

- **Diffraction** is the phenomenon of **spreading of waves around obstacles**.
- Diffraction takes place with **sound**; with electromagnetic radiation, such as **light, X-rays**, and gamma rays; and with very small moving particles such as atoms, **neutrons, and electrons**, which show wavelike properties. **Hence, option (d) is correct.**
- One consequence of diffraction is that sharp shadows are not produced.
- Diffraction of all four entities (light, electron, x-rays and neutrons) finds different applications including microscopy, material characterisation, crystal structure determination and medical applications.

#### 44. (a)

##### Explanation:

- Radioactive waste includes any material that is either intrinsically radioactive, or has been contaminated by radioactivity, and that is deemed to have no further use.
- Every radionuclide has a **half-life** – the time taken for half of its atoms to decay, and thus for it to lose half of its radioactivity.
- Radionuclides with **long half-lives tend to be alpha and beta emitters** – making their handling easier – while those with short half-lives tend to emit the more penetrating gamma rays. **Hence, statement (1) is correct.**
- Eventually all radioactive waste decays into non-radioactive elements. **The more radioactive an isotope is, the faster it decays. Hence, statement (2) is NOT correct.**

- Radioactive waste is typically classified as either low-level (LLW), intermediate level (ILW), or high-level (HLW), dependent, primarily, on its level of radioactivity.
- **Low-level waste (LLW)** has a radioactive content not exceeding four **giga-becquerels** per tonne (GBq/t) of alpha activity. LLW does not require shielding during handling and transport and is suitable for disposal in near surface facilities.
- **Intermediate-level waste (ILW) is more radioactive than LLW**, but the heat it generates ( $<2 \text{ kW/m}^3$ ) is not sufficient to be considered in the design or selection of storage and disposal facilities.
- ILW typically comprises **resins, chemical sludges, metal fuel cladding, and contaminated materials from reactor decommissioning**.
- Nuclear power is the only large-scale energy-producing technology that takes full responsibility for all its waste and fully costs this into the product.

#### 45. (c)

##### Explanation:

- Carbon sequestration is the **long-term storage of carbon in plants, soils, geologic formations, and the ocean**. **Hence, statement (1) is correct.**
- Carbon sequestration **occurs both naturally and because of anthropogenic activities** and typically refers to the storage of carbon. **Hence, statement (2) is correct.**
- Terrestrial carbon sequestration is the process through which  $\text{CO}_2$  from the atmosphere is **absorbed by trees and plants through photosynthesis and stored as carbon** in soils and biomass (tree trunks, branches, foliage, and roots).
- $\text{CO}_2$  can be stored, including **oil reservoirs, gas reservoirs, unmineable coal seams**, saline formations and shale formations with high organic content.
- Oceans absorb, release and store large amounts of  $\text{CO}_2$  from the atmosphere. This can be done in two ways – **enhancing productivity** of ocean biological systems through **Iron fertilization**, and **injecting  $\text{CO}_2$**  into the deep ocean.

#### 46. (b)

##### Explanation:

- **Co-Extinction:** When a species becomes extinct, the plant and animal species associated with it in an obligatory way also become extinct.



- When a host fish species becomes extinct, its unique assemblage of parasites also meets the same fate.
- Another example is the case of a coevolved **plant-pollinator mutualism** where extinction of one invariably leads to the extinction of the other.
- When a fish species extinct then all the parasites associated with it in an obligatory manner also become extinct.

Hence, option (b) is correct.

**47. (a)**

**Explanation:**

- The Convention for the Protection of the Mediterranean Sea Against Pollution (Barcelona Convention) was adopted on **16 February 1976 in Barcelona and entered into force in 1978.**
- The Barcelona Convention and its **seven Protocols** adopted in the framework of the Mediterranean Action Plan (MAP) constitute the principal regional legally binding Multilateral Environmental Agreement (MEA) in the Mediterranean.
- **Dumping Protocol**
  - The Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from **Ships and Aircraft** was **adopted in 1976 and entered into force in 1978.**
  - Its objective is for Contracting Parties to take all appropriate measures to prevent, abate and eliminate pollution of the Mediterranean Sea by dumping wastes or other matter.
- **Prevention and Emergency Protocol**
  - The Protocol Concerning Cooperation in Combating Pollution of the **Mediterranean Sea by Oil and other Harmful Substances in Case of Emergency** was adopted in **1976 and entered into force in 1978.**
- **Land-Based Sources Protocol**
  - The Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-Based Sources, was adopted in **1980 and entered into force in 1983.**
- **Specially Protected Areas and Biological Diversity Protocol**
  - The Protocol Concerning Mediterranean Specially Protected Areas was adopted in **1982** and entered into force in **1986.**

#### ○ **Offshore Protocol**

- The Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from the Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil was adopted in 1994 and entered into force in 2011.

#### ○ **Hazardous Wastes Protocol**

- The Protocol on the Prevention of **Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal** was adopted in **1996** and is in forced since 2008.

#### ○ **Integrated Coastal Zone Management Protocol**

- The Protocol on Integrated Coastal Zone Management in the Mediterranean, (ICZM Protocol).

Hence, option (a) is correct.

**48. (d)**

**Explanation:**

- **Vermis** are basically a **problematic animal** or a **nuisance creature** because they threaten **humans, crops, livestock, or property.**
- Species classified as the Vermin placed in **schedule V of the Wildlife Protection Act, 1972.** Hence, statement (2) is **NOT** correct.
- **Example: common crows, fruit bats, rats and mice,** which may be hunted freely.
- The act does not define the word **Vermin.** The **62<sup>nd</sup> section** of the **Wildlife Protection Act** grants the **central government** the power to declare any wild animal as vermin. Hence, statement (1) is **NOT** correct.
- Wild animal species placed in **Schedule I and Schedule II** of the **Wildlife Protection Act, 1972** **cannot be declared Vermin.**
- An animal can be declared as vermin for any **specified area** and a **specified period.**
- To prevent **human-wildlife conflicts**, several states in the past have petitioned to declare various animals to be **vermin**, including **elephants, Indian porcupine, bonnet macaque, common langur and barking deer.**
- **Wild boars, nilgai and rhesus monkeys** are Schedule II and III members, it is also protected, but can be hunted under specific conditions.

**49. (c)**
**Explanation:**

- Petro-crops are those plants that produce petroleum substances as supplementary to petrol. **Hence, statement (1) is correct.**
- These plants or algae produce hydrocarbon compound or ethanol.
- *Calotropis procera*, *Pedilanthus macrocarpus*, *Copifera langsdorfii*, and *Jatropha curcas* are examples of petro-crops.
- There are some species of certain families which accumulate the photo-synthetic products (hydrocarbons) of high molecular weight (10,000). They are commonly known as **petroplants** or **petroleum plants**.
- The product rich in **hydrocrackable hydrocarbon** is called as 'biocrude'. Hence, statement (2) is correct.

**50. (a)**
**Explanation:**

- The UNFCCC was adopted in **1992 at the Rio Earth Summit**. Hence, statement (1) is correct.
- The Intergovernmental Panel on Climate Change (IPCC) is a joint initiative of **World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP)**. Hence, statement (2) is NOT correct.
- IPCC reports are a key input into international climate change negotiations.
- The IPCC is an organization of governments that are members of the United Nations or WMO. The IPCC **does not conduct its own research**.
- Comprehensive scientific assessment reports are published every **5 to 7 years**. The IPCC is currently in its seventh assessment cycle, which formally began in July 2023 with the elections of the new IPCC and Taskforce Bureaus at the IPCC's Plenary Session in Nairobi.
- IPCC's latest report, the **Sixth Assessment Report**, was completed in **March 2023** with the release of its **Synthesis Report**, which provides direct scientific input to the first global Stock take process under the United Nations Framework Convention on Climate Change at **COP28 in Dubai**.

**51. (b)**
**Explanation:**

- Metal, any of a class of substances characterized by **high electrical and thermal conductivity** as well as by **malleability, ductility**, and high reflectivity of light. Metals are good conductors of electricity. Hence, they have low resistivity.
- Approximately three-quarters of all known chemical elements are metals. The most abundant varieties in the Earth's crust are aluminium, iron, calcium, sodium, potassium, and magnesium.
- Electronegativity is the ability of an atom to attract to itself an electron pair shared with another atom in a chemical bond. Metals typically exhibit **low electronegativity** and accordingly higher tendency to lose electron and get oxidised.
- The ability of metals to be drawn into **thin wires** is called **ductility**. Typically, metals have high ductility and can be heavily deformed plastically.

**Hence, option (b) is correct.**
**52. (b)**
**Explanation:**

- pH is a measure of the **hydrogen ion (H<sup>+</sup>) concentration** in an aqueous solution. It is calculated as negative logarithm of hydrogen ion concentration. The **scale ranges from 0 to 14**.
- A pH of 7 is considered neutral pH. Lower pH values indicate acidic solutions while higher pH values are assigned to alkaline or basic solutions.
- Water has a pH equal to 7 indicating it is a neutral liquid. Any substance dissolved in water will lead to lowering of pH if the substance is acidic or the product of such dissolution is acidic.
- **Vinegar** and **Orange Juice** are **acidic** in nature as they contain **acetic acid and citric acid respectively**.
- **Carbon dioxide** dissolution in water produced mildly acidic carbonic acid and thus **lowers the pH of water**. This is one of the reasons for increased ocean acidification with increased carbon dioxide in the atmosphere.
- **Baking soda** and **Milk of Magnesia** (Magnesium Hydroxide) are **basic** in nature. So, their dissolution in water **leads to an increase in pH value** of the solution.

**Hence, option (b) is correct.**

53. (a)

Explanation:

- **Diamond, graphite and fullerenes** (substances that include nanotubes and ‘buckyballs’, such as buckminsterfullerene) are three allotropes of pure carbon.
- In all three allotropes, the carbon atoms are joined by strong covalent bonds, but in such different arrangements that the properties of the allotropes are very different.
- In diamond, each carbon shares electrons with four other carbon atoms - forming four single bonds.
- In **Graphite**, each carbon atom uses three of its electrons to form simple bonds to its three close neighbors. That leaves a **fourth electron** in the bonding level.
- These “spare” electrons in each carbon atom become **delocalized** over the whole of the sheet of atoms in one layer. They are no longer associated directly with any particular atom or pair of atoms, but are free to wander throughout the whole sheet.
- The important thing is that the **delocalized electrons are free to move anywhere** within the sheet - each electron is no longer fixed to a particular carbon atom.
- There is, however, no direct contact between the delocalized electrons in one sheet and those in the neighbouring sheets. **The atoms within a sheet are held together by strong covalent bonds - stronger, in fact, than in diamond because of the additional bonding caused by the delocalized electrons. Hence, statement (1) is correct.**
- Both have high melting points. **Diamond** has a very **high melting point of almost 4000°C** while graphite has a melting point of nearly 3600 °C. **Hence, statement (2) is NOT correct.**

54. (a)

Explanation:

- **Dmitri Mendeleev** is the scientist who is generally credited with the development of the Modern Periodic Table. **Hence, statement (1) is correct.**
- While **Dobereiner** initiated the study of periodic relationships, it was **Mendeleev** who was responsible for publishing the Periodic Law for the first time.
- His periodic law stated that ‘The properties of the elements are a **periodic function of their atomic weights**’. **Hence, statement (2) is NOT correct.**

- Mendeleev arranged elements in horizontal rows and vertical columns of a table in order of their **increasing atomic weights** in such a way that the elements with similar properties occupied the same vertical column or group.
- When Mendeleev developed his Periodic Table, chemists knew nothing about the internal structure of atom. However, the beginning of the 20th century witnessed profound developments in theories about sub-atomic particles.
- It was shown that the atomic number is a more fundamental property of an element than its atomic mass.
- Mendeleev’s Periodic Law was, therefore, accordingly modified. This is known as the **Modern Periodic Law** and can be stated as: The physical and chemical properties of the elements are periodic functions of their **atomic numbers**.

55. (b)

Explanation:

- The formation of a solution may be viewed as a stepwise process in which energy is consumed to overcome solute-solute and solvent-solvent attractions (endothermic processes) and released when **solute-solvent** attractions are established (an **exothermic process** referred to as solvation). **Hence, statement (1) and statement (2) are correct.**
- The relative magnitudes of the energy changes associated with these stepwise processes determine whether the dissolution process overall will release or absorb energy.
- In some cases, solutions do not form because the energy required to separate solute and solvent species is so much greater than the energy released by solvation.
- For example, in case of dissolution of an ionic compound in water, formation of the solution requires the electrostatic forces between the cations and anions of the compound (solute-solute) be overcome completely as attractive forces are established between these ions and water molecules (solute-solvent). Hydrogen bonding between a relatively small fraction of the water molecules must also be overcome to accommodate any dissolved solute.
- If the solute’s electrostatic forces are significantly greater than the solvation forces, the dissolution process

is significantly endothermic and the compound may not dissolve to an appreciable extent. Calcium carbonate, the major component of coral reefs, is one example of such an “insoluble” ionic compound.

- Spontaneous solution formation is favoured, but not guaranteed, by exothermic dissolution processes. While many soluble compounds do, indeed, dissolve with the release of heat, some dissolve endothermically.
- **Ammonium nitrate ( $\text{NH}_4\text{NO}_3$ ) is one such example and is used to make instant cold packs for treating injuries. Hence, statement (3) is NOT correct.**
- Endothermic dissolutions such as this one require a greater energy input to separate the solute species than is recovered when the solutes are solvated, but they are spontaneous nonetheless due to the increase in disorder that accompanies formation of the solution.

**56. (b)**

**Explanation:**

- Plastics can be categorized as **Thermoplastics and Thermosetting plastics** depending on their behaviour when they are exposed to heat.
- **Thermoplastics:** This type of plastic **softens when heated** and upon cooling down it regains its hardness. It can be heated and cooled repeatedly without much change in their properties.
- Examples of thermoplastic include **polyethylene, polystyrene, polyvinyl chloride, teflon etc.**
- **Thermosetting plastics:** This type of plastic undergoes **permanent change upon heating**. They become hard and infusible upon heating due to the extensive cross-linking occurring due to heat. They cannot be reused or reshaped using heat.
- Examples of thermosetting plastics include **bakelite, glyptal, terylene etc.**

**Hence, option (b) is correct.**

**57. (c)**

**Explanation:**

- **Liquefied Petroleum Gas (LPG)** is mainly a mix of **butane and isobutane** with small amounts of propane. It is petroleum gas that is liquefied under compression and stored in iron cylinders.
- It is used as a domestic fuel.
- **Ethyl mercaptan** is added which causes **foul stench**. This helps in leak detection in domestic set up.

- Tetra ethyl lead is an antiknock compound that is added to reduce knocking or to improve octane number of a fuel. Knocking is the metallic sound produced due to irregular burning of fuel in the engine.
- Ethylene glycol is a commonly used **antifreeze** that decreases the freezing point of the solution. It is commonly used in very cold regions as automotive antifreeze in coolant.
- Methyl isocyanate is a **colourless and toxic gas**. It was the gas released in large amount from insecticide plant of Union Carbide subsidiary that caused the Bhopal Gas tragedy.

**Hence, option (c) is correct.**

**58. (d)**

**Explanation:**

- A process is called **Isobaric** when the pressure remains constant throughout the process.
- A process is called **Isochoric** if the process is carried out at constant **volume** throughout.
- A process is called **Isothermal** is the temperature remains constant throughout the process.
- In Adiabatic process there is **no exchange of heat between the system and surroundings**. The system remains completely isolated thermally from its surroundings. All the work done in compressing the system goes into the system as internal energy and thus it raises its temperature.
- In the process described in question, the gas is being compressed hence the volume is decreasing. The description mentions rising pressure and temperature. Accordingly the process is not isochoric, isobaric or isothermal.
- The description provided states that the system is ‘completely thermally insulated’ i.e. there is no exchange of heat between the system and the surroundings. This makes the process adiabatic.

**Hence, option (d) is correct.**

**59. (b)**

**Explanation:**

- Carbon nanotube are nanoscale hollow tubes composed of carbon atoms.
- The cylindrical carbon molecules feature high aspect ratios (length-to-diameter values) typically above 1000, with diameters from about 1 nanometer up to tens of nanometers and lengths up to millimeters.
- Carbon nanotubes are **members of the fullerene family**.



- Although the first fullerene molecules were discovered in 1985, it was not until Sumio Iijima reported his findings in 1991 about needle like carbon tubes that carbon nanotubes came to public awareness. **Hence, statement (1) is correct.**
- A SWNT can be described as a long tube formed by wrapping a single graphene sheet into a cylinder with diameter of about 1 nanometer, the ends of which are capped by fullerene cages.
- The **sidewalls of carbon nanotubes are made of graphene sheets** consisting of neighbouring hexagonal cells. **Hence, statement (2) is correct.**
- The structural variations in SWNT result in differences in electrical conductivity and mechanical strength. Carbon nanotubes can behave as metallic or as semiconductors in terms of electrical conductivity.
- In terms of thermal properties, carbon nanotubes **outperform diamond as the best thermal conductor.** **Hence, statement (3) is NOT correct.**

**60. (c)**

**Explanation:**

- **Alcohols** are organic compounds with functional group ‘-OH’ attached to a hydrocarbon (compound made of carbon and hydrogen) chain or alkyl group.
- Ethers are organic compounds with two alkyl groups attached to a single oxygen atom acting.
- Haloalkanes are compounds in which a hydrogen atom in an alkane hydrocarbon chain is replaced by chlorine or bromine. Alkanes are hydrocarbon chains with no double or triple bonds. Thus, **Haloalkane have carbon, hydrogen and chlorine or bromine (halogen elements).**
- Ketones are organic compounds with two alkyl groups attached to a carbon atom doubly bonded to an oxygen atom.

Hetero Atom	Class of Compounds	Formula of Functional Group
Cl/Br	Halo- (Chloro-bromo) Alkane	-Cl, -Br (substitutes for hydrogen atom)
Oxygen	1. Alcohol	-OH
	2. Aldehyde	$\begin{array}{c} \text{H} \\ \diagup \\ \text{C} \\ \diagdown \\ \text{O} \end{array}$

3. Ketone	$\begin{array}{c} \text{O} \\ \parallel \\ \text{C} \end{array}$
4. Carboxylic acid	$\begin{array}{c} \text{O} \\ \parallel \\ \text{C}-\text{OH} \end{array}$

**Hence, option (c) is correct.**

**61. (b)**

**Explanation:**

- Recently, the Union Minister of State for Rural Development, in a written reply in Rajya Sabha has given information about Self Help Group (SHG) Bank linkage (BL).
- In 2019, the International Initiative for Impact Evaluation assessed Deendayal Antyodaya Yojana-National Rural Livelihood Mission (DAY-NRLM), finding a 19% income boost and a 28% increase in household savings compared to the baseline.
- The study spanned nine states: Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Uttar Pradesh, and West Bengal.
- **Self Help Group (SHG) Bank linkage (BL) Project:**
  - The SHG BL Project was launched by the **National Bank for Agriculture and Rural Development (NABARD) in 1992.** **Hence, statement (1) is NOT correct.**
  - It has since blossomed into the world’s largest microfinance project in terms of client base and outreach. **Hence, statement (3) is correct.**
  - Under this programme, banks were allowed to **open savings accounts for SHGs.** **Hence, statement (2) is correct.**

**62. (d)**

**Explanation:**

- The historic **Bali Jatra, which is also known as Baliyatra**, got off to a colorful start in **Odisha’s Cuttack** on November 27, 2023.
- The festival, which marks the end of the ‘kartik’ month, celebrates the day when ‘sadhavas’ or mariners used to set sail for distant lands such as Bali, Java, Sumatra and Borneo in Indonesia, and Sri Lanka for trade.
- The literal meaning of Baliyatra is “voyage to Bali”. Bali is an island of Indonesia.



- The Kalinga Empire (present-day Odisha) is known for its glorious maritime history. Due to the geographical location of Kalinga, this area saw the growth of ports as early as the 4th and the 5th century BC.
- Some of the famous ports, Tamralipti, Manikpatna, Chelitalo, Palur, Pithunda allowed India to connect with other countries via the sea. Soon, the Kalingas had trade links with Srilanka, Java, Borneo, Sumatra, Bali and Burma. Bali formed a part of the four islands that were collectively called the *Suvarnavdipa*, today known as Indonesia.

Hence, option (d) is correct.

63. (d)

Explanation:

- The **S-400 Triumf** is a mobile, **surface-to-air missile system (SAM)** designed by **Russia**. It is the most dangerous operationally deployed modern long-range SAM (MLR SAM) in the world, considered much ahead of the **US-developed Terminal High Altitude Area Defense system (THAAD)**. Hence, **statement (1) is NOT correct**.
- The system **can engage all types of aerial targets** including aircraft, unmanned aerial vehicles (UAV) and ballistic and cruise missiles within the range of 400km, at an altitude of up to 30km. Hence, **statement (2) is NOT correct**.
- The system **can track 100 airborne targets and engage six of them simultaneously**.

64. (a)

Explanation:

- **Autonomous unmanned Research aircraft (AURA)** is an **autonomous unmanned combat air vehicle (UCAV)**, The ADA describes the AURA as a “self-defending high-speed reconnaissance UAV with weapon firing capability”.
- The project is being developed by the **Defence Research and Development Organisation** for the Indian Air Force and Indian Navy. The design work on the UCAV is to be carried out by the **Aeronautical Development Agency (ADA)**.
- The UCAV will be capable of releasing missiles, bombs and precision-guided munitions.
- **SAHAYAK-NG is India’s first indigenously designed and developed Air Droppable Container**.

- It is a GPS aided air dropped container with the capacity to carry a **payload of up to 50 kg** and can be dropped from a heavy aircraft.

Hence, option (a) is correct.

65. (c)

Explanation:

- PSLV (Polar Satellite Launch Vehicle) and GSLV (Geosynchronous Satellite Launch Vehicle) are the satellite-launch vehicles developed by ISRO.
- PSLV delivers the “earth-observation” or “remote-sensing” satellites in polar orbit. Hence, **statement (1) is correct**.
- Apart from launching the remote sensing satellites to Sun-synchronous polar orbits, the PSLV is also used to launch the satellites of lower mass of about **1400 Kg to the elliptical Geosynchronous Transfer Orbit (GTO)**. Hence, **statement (2) is correct**.
- It is a **four-staged launch vehicle** with **first and third stage using solid fuel** and **second and fourth stages using liquid fuel**. Strap-on motors also used with PSLV to augment the thrust.
- PSLV is classified into its various versions like **core-alone version (PSLV-CA) or PSLV-XL** variants.
- GSLV delivers the communication-satellites to the Geosynchronous Transfer Orbit (GTO) of about **36000 Km altitude**. Hence, **statement (3) is correct**.
- Two versions of the GSLV are developed by ISRO and testing phase of third version is going on. The first version, GSLV Mk-II, can launch satellites of mass up to 2,500 kg to the GTO.
- **GSLV MK-II is a three-staged vehicle** with first stage solid fuel, second stage using Liquid fuel and the third stage, called **Cryogenic Upper Stage**, using cryogenic engine.

66. (a)

Explanation:

- **Recombinant DNA (rDNA)** represents a sophisticated molecular technique that facilitates the joining of DNA fragments from diverse sources, resulting in unique sequences not naturally present in any genome.
- This technology hinges on the universal nature of DNA’s chemical structure across all organisms, with variations only in the nucleotide sequences. Consequently, rDNA can be synthesized by merging DNA fragments from disparate species, leading to what is sometimes termed as “**chimeric DNA**”, reminiscent of the mythical creature, chimera.

- The process of creating rDNA involves the utilization of palindromic sequences, producing both sticky and blunt ends. Remarkably, the origin of the DNA sequences used in rDNA synthesis can be incredibly diverse. They can be derived from any organism, such as combining plant DNA with bacterial DNA or even amalgamating human DNA with fungal DNA.

Hence, option (a) is correct.

**67. (a)**

**Explanation:**

- **Generation mix:** coal 1097 TWh (72%); hydro 161 TWh (11%); **wind 67.4 TWh (4%)**; natural gas 65.7 TWh (4%); **solar 61.3 TWh (4%)**; **nuclear 43.0 TWh (3%)**; biofuels & waste 35.1 TWh (2%); oil 3.2 TWh. Hence, statement (1) is NOT correct.
- **Kudankulam 1&2:** Russia's Atomstroyexport supplied the country's first large nuclear power plant, comprising two VVER-1000 (V-412) reactors, under a Russian-financed US\$ 3 billion contract and 1988 Russia-India agreement with 1998 supplement. Hence, statement (2) is correct.
- While Jharkhand and Andhra Pradesh have significant uranium deposits, **they are not the only states with uranium deposits in India**. Other states like Meghalaya, Rajasthan, and Karnataka also have uranium reserves. Hence, statement (3) is NOT correct.

State	Districts	Main Deposits	Tonnes U
Andhra Pradesh	YSR	Tummalapalle	120,229
	Guntur	Koppunnu	2341
	Kurnool	Kappatralla	?
Telangana	Nalgonda	Lambapur, Pedagattu, Chitrial	15, 731
Jharkhand	E. Singhbhum	Jaduguda, Bhatin, Narwapahar, Turamidh, Banduhurang, Mohuldih, Bagjata	53,731
	Saraikela-Kharswan	Bangurdih	1367

Meghalaya	West Khasi Hills	KPM (Domiasat), Wahkyn, Wahkut	19,538
Rajasthan	Sikar, Udaipur	Rohil, Umra	7989
Karnataka	Yadgir, S. Kanara	Gogi	3970
Chhattisgarh	Rajanandgaon, Surguja	Bodal, Jajawal	3380
Uttar Pradesh	Sonbhadra	Naktu	666
Uttarakhand	Rudraprayag	Pokhri-Tunji	85
Himachal Pradesh	Una, Shimla, Mandi	Rajpura	665
Maharashtra	Gondia	Mogara	301
<b>Total</b>			<b>229,499</b>

**68. (b)**

**Explanation:**

- **Ecosystem functions through the input of energy mainly as solar radiation.** Primary producers trap this energy and use it to prepare food.
- The energy stored as food in primary producers is passed through the trophic levels of the ecosystem.
- This **energy flow (transfer of organic molecules) is unidirectional** through the trophic levels of the ecosystem and is **non-cyclic**. Hence, statement (1) is NOT correct.
- An energy pyramid reflects the laws of thermodynamics, with conversion of solar energy to chemical energy and heat energy at each trophic level and with **loss of energy being depicted at each transfer to another trophic level**. Hence, the energy pyramid is always upward with a large energy base at the bottom.
- The **usable energy decreases from sunlight to producer to herbivore to carnivore**. Therefore, the energy pyramid will always be upright. Hence, statement (2) is correct.

**69. (a)**

**Explanation:**

- In **primary succession** on a **terrestrial site** the **new site is first colonized by a few hardy pioneer** species that are often microbes, lichens and mosses. The pioneers over a few generations alter the habitat conditions by their growth and development.

- Over time their activities lead to development of soil in which seeds can become lodged and grow. As the organism community develops, it becomes more diverse and competition increases, but new niche opportunities develop.
- **Secondary succession** occurs in areas in which the climax community has been disturbed. Secondary succession is the sequential development of biotic communities after the complete or partial destruction of the existing community.
- • A mature or intermediate community may be destroyed by natural events such as floods, droughts, fires, or storms or by human interventions such as deforestation, agriculture, overgrazing, etc.
- **Jhum cultivation destroys a patch of forest for cultivation and after few years of cultivation** the patch is left for the forest to regenerate. It is thus an example of secondary succession. **Hence, statement (1) is NOT correct.**
- **Secondary succession occurs in areas which have already well-developed soil.** Secondary succession is relatively faster than primary succession. **Hence, statement (2) is correct.**
- **Keystone species** is a species that has a **disproportionately large effect on the communities in which it lives**; many are apex predators (meaning without a natural predator or enemy).
- Such species help to maintain local biodiversity within a community either by controlling populations of other species that would otherwise dominate the community or by providing critical resources for a wide range of species. **Hence, statement (3) is NOT correct.**

70. (c)

**Explanation:**

- The word “plankton” comes from the Greek for “drifter” or “wanderer.”
- An organism is considered plankton if it is **carried by tides and currents and cannot swim well** enough to move against these forces. **Hence, statement (1) is correct.**
- Some plankton drift this way for their entire life cycle. Others are only classified as plankton when they are young, but they eventually grow large enough to swim against the currents.

- The most basic classification divides plankton into two groups: phytoplankton (plants) and zooplankton (animals).
- **Phytoplankton** are **microscopic plants**, but they play a huge role in the marine food web. Like plants on land, phytoplankton perform photosynthesis to convert the sun’s rays into energy to support them, and they take in carbon dioxide and produce oxygen. Because they need the sun’s energy, phytoplankton are found near the water’s surface.
- **Zooplankton** includes **microscopic animals** (krill, sea snails, pelagic worms, etc.), the young of larger invertebrates and fish, and weak swimmers like jellyfish. Most zooplankton eat phytoplankton, and most are, in turn, eaten by larger animals (or by each other). **Hence, statement (2) is correct.**
- **Scientists estimate that roughly half of the oxygen production on Earth comes from the ocean.** The majority of this production is from oceanic plankton — drifting plants, algae, and some bacteria that can photosynthesize. **Hence, statement (3) is correct.**

71. (a)

**Explanation:**

- **In-situ conservation** refers to conservation of animals and plants in their natural habitats. Examples of in-situ conservation include :
  - **National parks**
  - **Sanctuaries**
  - **Biosphere reserves** and
  - **Reserved forests**
  - **Protected forests**
- **Ex-situ conservation** refers to conservation of biodiversity outside the areas where they naturally occur. Here, animals are reared, or plants are cultivated like zoological parks or botanical gardens.
- Reintroduction of an animal or plant into the habitat from where it has become extinct is another form of ex-situ conservation.
- For example, the Gangetic gharial has been reintroduced in the rivers of Uttar Pradesh, Madhya Pradesh and Rajasthan where it had become extinct.
- Examples of ex-situ conservation include seed banks, botanical, horticultural and recreational gardens.

**Hence, option (a) is correct.**

**72. (b)**
**Explanation:**

- The International Union for Conservation of Nature (IUCN) Red List of Threatened Species is one of the most well-known objective assessment systems for classifying the status of plants, animals, and other organisms threatened with extinction. The International Union for Conservation of Nature (IUCN) unveiled this assessment system in 1994.
- **The IUCN system uses a set of five quantitative criteria** to evaluate if a taxon belongs in an IUCN red list **threatened category** (critically endangered, endangered or vulnerable). These criteria consider:
  - **Population size reduction.** Population reduction (measured over the longer of 10 years or 3 generations)
  - **Geographic range** in the form of either extent of occurrence AND/OR area of occupancy
  - **Small population** size and decline
  - Very small or restricted population (this includes number of mature individuals)
  - Whether the results of a **quantitative analysis** indicate a high probability of extinction in the wild
- Critically Endangered (CR): A category containing those species that possess an extremely high risk of extinction as a result of rapid population declines of 80 to more than 90 percent over the previous 10 years (or three generations), a current population size of fewer than 50 individuals, or other factors
- Endangered (EN): A designation applied to species that possess a very high risk of extinction as a result of rapid population declines of 50 to more than 70 percent over the previous 10 years (or three generations), a current population size of fewer than 250 individuals, or other factors
- Vulnerable (VU): A category containing those species that possess a very high risk of extinction as a result of rapid population declines of 30 to more than 50 percent over the previous 10 years (or three generations), a current population size of fewer than 1,000 individuals, or other factors.

**Hence, option (b) is correct.**
**73. (c)**
**Explanation:**

- The Yangtze finless porpoise lives in the Yangtze River, the longest river in Asia. At one point, this porpoise shared the waters with the Baiji (Yangtze River dolphin)—a species declared functionally extinct in 2006. The Yangtze finless porpoise is known for its mischievous smile.
- Dredging, pollution, and boat strikes from shipping and transportation on the river threaten the finless porpoise. Sand mining and illegal fishing also impacted the species.
- Dolphins tend to have prominent, elongated “beaks” and cone-shaped teeth, while porpoises have smaller mouths and spade-shaped teeth. **Hence, statement (1) is correct.**
- The dolphin’s hooked or curved dorsal fin (the one in the middle of the animal’s back) also differs from the porpoise’s triangular dorsal fin. Generally speaking, dolphin bodies are leaner, and porpoises’ are portly. **Hence, statement (3) is correct.**
- Dolphins are also more talkative than porpoises. Dolphins make whistling sounds through their blowholes to communicate with one another underwater. **Hence, statement (2) is correct.**
- Dolphins and porpoises have many similarities, one of which is their extreme intelligence. Both have large, complex brains and a structure in their foreheads, called the melon, with which they focus sound waves used to navigate their underwater world.

**74. (b)**
**Explanation:**

- The **COP-27 to the UNFCCC** was held from 6 to 20 November 2022 in **Sharm el-Sheikh, Egypt**.
- In conjunction with COP 27, the 17<sup>th</sup> session of the conference of parties serving as the meeting of parties to the Kyoto Protocol (CMP 17), the 4<sup>th</sup> session of the conference of parties serving as the meeting of parties to **Paris agreement** (CMA 4) 57<sup>th</sup> session of the subsidiary body for scientific and technological advice (SBSTA) and subsidiary body for implementation (SBI) were also held.
- **The Just Transition and mitigation Work programme** to be set up. Joint work on implementation of climate action on agriculture and food security to be conducted over 4 years.



- A **new fund** to be set up to assist developing countries vulnerable to adverse effects of climate change – transitional committee to work out the modalities.
- With focus on lifestyle for environment, India invited all the countries to join the movement (which is pro people and pro planet effort for mindful and deliberate utilization of natural resources) **Hence, option (b) is correct.**

**75. (b)**

**Explanation:**

- The **Breakthrough Agenda Report 2023** is an **annual collaboration** between the **International Energy Agency (IEA), the International Renewable Energy Agency (IRENA), and the United Nations Climate Change High-Level Champions.** Hence, **statement (1) is NOT correct.**
- Its focus is on strengthening **international cooperation to accelerate the reduction of global greenhouse gas emissions.** Hence, **statement (2) is correct.**
- The report **evaluates progress made since 2022 in priority areas for global collaboration.**
- It offers recommendations **for countries to work together in these sectors to reduce emissions over the next decade and mitigate the worst effects of climate change.**
- The report acknowledges the accelerating transition to clean energy and sustainable solutions in various sectors, particularly in technologies like electric vehicles and solar PV.
- It notes that **electric passenger cars are expected to represent 18% of total car sales in 2023, and clean energy technology investments are surpassing spending on fossil fuels.**

**76. (a)**

**Explanation:**

- **Jaldapara National Park** is situated at the foothills of the **Eastern Himalayas** in Alipurduar District of northern **West Bengal** and on the banks of the **Torsa River** at an altitude of 61 m from MSL and is spread across 216.51 km<sup>2</sup> of vast grassland with patches of riverine forests.
- The **Neora Valley National Park (NVNP)**, covers a total area of 88 km<sup>2</sup>. NVNP is a compact patch of virgin forest, rich in biodiversity located in the Eastern Himalayas, a global '*biodiversity hotspot*'.

- NUNP was notified as a National Park based on the provisions of the Wildlife (Protection) Act 1972 in the year 1992. It is contiguous with Sikkim and Bhutan at its northern and north-eastern boundaries respectively and links the Pangolakha Wildlife Sanctuary in Sikkim and the Toorsa Strict Reserve of Bhutan.

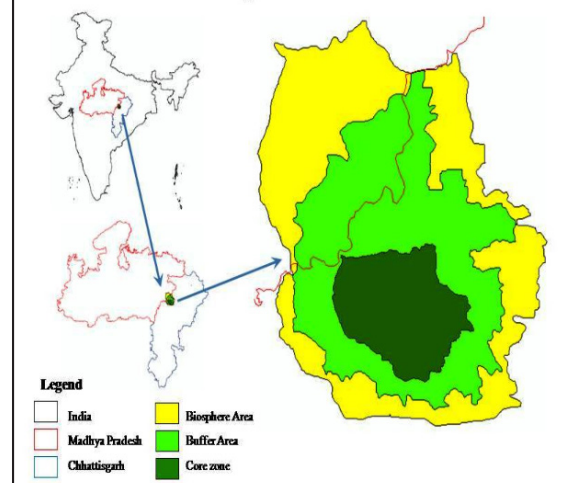
**Hence, option (a) is correct.**

**77. (a)**

**Explanation:**

- **Achanakmar-Amarkantak Biosphere Reserve** is named after Achanakmar forest village and Amarkantak, a holy place from **where the Narmada, Johilla and Sone rivers** emerge. Hence, **statement (3) is correct.**
- Achanakmar-Amarkantak Biosphere Reserve was declared as Biosphere Reserve (BR) by Government of India, 2005.
- It is spread from **Maikal hill ranges** to the junction of Vindhyan and Satpura hill ranges in a triangular shape. Bilaspur and Marwahi forest divisions of the Chhattisgarh state, Dindori and Anuppur forest divisions of Madhya Pradesh state surround the core zone of BR. Hence, **statement (1) is NOT correct.**
- The total geographical area of BR is 3835.51 sq. km. The **core area** of the BR, falls in **Chhattisgarh state.** It is surrounded by buffer and transition zone area falls in Bilaspur and Marwahi forest divisions of Chhattisgarh and in Dindori and Anuppur forest divisions of **Madhya Pradesh.** Hence, **statement (2) is NOT correct.**

**Location map of Achanakmar Amarkantak Biosphere Reserve**





**78. (d)**

**Explanation:**

- People often bring **non-native species**, accidentally or on purpose, into new areas where the species have few or no natural predators to keep their populations in check.
- Alien species are those occurring outside their natural range.
- Alien species that threaten native plants and animals or other aspects of biodiversity are called **invasive alien species**. They occur in all groups of plants and animals, as competitors, predators, pathogens and parasites, and they have invaded almost every type of native ecosystem.
- Biological invasion by alien species is recognised as one of the major threats to native species and ecosystems. The effects on biodiversity are enormous and often irreversible.
- Eichhornia Crassipes (Mart.) Solms commonly called **water hyacinth** is an aquatic invasive alien species in India.
- Cyprinus carpio known as **common carp** is an inland invasive alien species of fish in India.
- Pennisetum purpureum Schumacher commonly called **elephant grass** is a terrestrial invasive alien plant species in India.
- Rosewood are **tropical trees that are native to Brazil, Honduras, Jamaica, Africa, and India**.

Hence, option (d) is correct.

**79. (a)**

**Explanation:**

- The **Wild Life (Protection) Act of 1972** provided for the declaration of certain areas by the State Government as wildlife sanctuaries if the area was thought to be of adequate ecological, geomorphological and natural significance.
- **National Park (NP)**: WPA provided for the declaration of National Parks by the State Government in addition to the declaration of wildlife sanctuaries. **Hence, statement (3) is NOT correct, and statement (1) is correct.**
- National Parks are declared in areas that are considered to be of adequate ecological, geomorphological and natural significance although within the law, the difference in conservation value of a National Park from that of a sanctuary is not specified in the WPA 1972.

- If it is satisfied that an area is of adequate ecological, faunal, floral, geomorphological, natural or zoological significance then the Central Government may, for the purpose of protecting, propagating or developing wildlife or its environment, declare it a sanctuary/ National Park by notification.
- National Parks enjoy a greater degree of protection than sanctuaries. Certain activities which are regulated in sanctuaries, such as grazing of livestock, are prohibited in National Parks. **Hence, statement (2) is NOT correct.**
- Wildlife sanctuary can be created for a particular species whereas the national park is not primarily focused on a particular species.

**80. (b)**

**Explanation:**

- Orangutans are **great apes** native to the **rainforests of Indonesia and Malaysia**. They are now found **only in parts of Borneo and Sumatra**. **Hence, statement (1) is NOT correct.**
- Bornean and Sumatran orangutans differ a little in appearance and behavior. While both have shaggy reddish fur, Sumatran orangutans have longer facial hair. Sumatran orangutans are reported to have closer social bonds than their Bornean cousins.
- Bornean orangutans are more likely to descend from the trees to move around on the ground. Both species have experienced sharp population declines.
- A century ago there were probably more than 230,000 orangutans in total, but the Bornean orangutan is now estimated at about 104,700 based on updated geographic range (Endangered) and the Sumatran about 7,500 (Critically Endangered).
- A third species of orangutan was announced in November, 2017. With no more than 800 individuals in existence, the **Tapanuli orangutan is the most endangered of all great apes**. **Hence, statement (2) is correct.**

**81. (d)**

**Explanation:**

**Shailesh Nayak Committee Report on Coastal Regulation Zone (CRZ):**

- The six-member committee was formed in **June 2014** and submitted the report to the Ministry of Environment,

Forests and Climate Change (MOEF&CC) in January 2015. It examined issues related to the **CRZ Notification, 2011**.

- As per the report, it proposes the decentralization of powers to state and union territory governments along with local authorities as required by several states.
- The **Shailesh Nayak Committee** report has planned for permitting housing infrastructure and slum redevelopment activities, tourism, ports and harbor and fisheries-related activities in coastal regulation zones to relax the present restrictions on coastal area expansion.
- Based on the recommendations of Shailesh Nayak committee, the suggestions were given by the coastal states and union territories, and the CRZ 2018 notifications were issued.

Hence, option (d) is correct.

**82. (c)**

**Explanation:**

- A **net-zero energy building** is one that **relies on renewable sources to produce as much energy as it uses**, usually as measured over the course of a year.  
**Hence, statement (1) is correct.**
- Homes and other structures that create almost as much energy as they use are sometimes called near-zero energy buildings.
- It is also possible for a building to produce an energy surplus, sending excess back to the electrical grid.
- Net-zero energy buildings start with **energy-conscious design**. Many features work without an energy source.

**For example:**

- In cold climates, south-facing buildings with large expanses of windows on that side can produce heat through passive solar gain. **Hence, statement (2) is correct.**
- On the cold north side of the building, smaller windows can angle to wider openings, permitting more light while limiting heat loss.
- In warmer seasons, passive ventilation systems can pull cool air up from the lower levels and vent it through the building's highest point.
- Rooftop systems can collect rainwater to reduce usage of treated water.

**83. (a)**

**Explanation:**

EIA involves the steps mentioned below. However, the EIA process is cyclical with interaction between the various steps.

- **Screening:** The project plan is screened for scale of investment, location and type of development and if the project needs statutory clearance.
- **Scoping:** The project's **potential impacts, zone of impacts, mitigation possibilities** and need for monitoring.
- **Collection of baseline data:** Baseline data is the environmental status of study area.
- **Impact prediction:** Positive and negative, reversible and irreversible and temporary and permanent impacts need to be predicted which presupposes a good understanding of the project by the assessment agency.
- **Mitigation measures and EIA report:** The EIA report should include the actions and steps for preventing, minimizing or by passing the impacts or else the level of compensation for probable environmental damage or loss.
- **Public hearing:** On completion of the EIA report, public and environmental groups living close to project site may be informed and consulted.
- **Decision making:** Impact Assessment Authority along with the experts consult the project-in-charge along with consultant to take the final decision, keeping in mind EIA and EMP (Environment Management Plan).

### The EIA Process



Hence, option (a) is correct.

84. (b)

**Explanation:**

- The **National Mission for Enhanced Energy Efficiency (NMEEE)** is one of the eight national missions under the **National Action Plan on Climate Change (NAPCC)**.
- It is governed by the **Ministry of Power**. Hence, **statement (1) is NOT correct**.
- It is based on the **Energy Conservation Act, 2001**. Hence, **statement (2) is correct**.
- It creates a market-based mechanism to **enhance cost effectiveness** of improvements on energy efficiency. Switching to cleaner fuels, commercially viable technology transfers, capacity building needs etc. are the way forward for this mission.
- **Development with energy efficiency** is a key criterion.
- It **spread awareness** about the **efficacy and efficiency of energy efficient** products and **create demand**.
- Bureau of Energy Efficiency (BEE) signed MoU with **Small Industries Development Bank of India (SIDBI)** on 3rd November 2022 to promote energy efficiency financing for MSMEs and exploring IoT based solutions, Greening **MSMEs**, capacity building of various stakeholders, etc. Under this MoU, BEE and SIDBI launched a tool called **UNNATEE** in **National Conclave** on 9<sup>th</sup> Dec. 2022 along with mobile app which can be downloaded from google play store free of cost. Hence, **statement (3) is correct**.
- The Government of India has set up **Bureau of Energy Efficiency (BEE)** on 1st March 2002 under the provision of the **Energy Conservation Act, 2001**.

85. (d)

**Explanation:**

- The **National Framework for Climate Services (NFCS)** is a platform that provides climate information and services for sectors like agriculture, energy, disaster management, health, and water.
- Here are **some countries that have implemented the NFCS**: China, Germany, Switzerland, United Kingdom, India. Hence, **statement (1) is NOT correct**.
- The **Global Framework for Climate Services (GFCS)** is the main platform for improving, expanding, and coordinating the delivery of climate services for sustainable development and climate change decision-making.

- The **India Meteorological Department (IMD)** is the **nodal agency for the National Framework for Climate Services (NFCS)**. The NFCS is an initiative to establish a comprehensive system for delivering climate information and services. The NFCS aims to help India meet the challenges of climate change. Hence, **statement (2) is NOT correct**.

86. (d)

**Explanation:**

**National Green Tribunal (NGT):**

- It is a specialised body set up under the **National Green Tribunal Act (2010)** for effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources. Hence, **statement (1) is NOT correct**.
- With the establishment of the NGT, **India became the third country** in the world to set up a specialised environmental tribunal, only after Australia and New Zealand, and the first developing country to do so. Hence, **statement (2) is NOT correct**.
- NGT is mandated to make disposal of applications or appeals finally within 6 months of filing of the same.
- The NGT has **five** places of sittings, **New Delhi** is the **Principal** place of sitting and **Bhopal, Pune, Kolkata and Chennai** are the other four.
- The Tribunal comprises of the Chairperson, **the Judicial Members and Expert Members**. They shall hold office for term of **three years or till the age of sixty-five years**, whichever is earlier and are not eligible for reappointment.
- The Chairperson is appointed by the **Central Government** in consultation with **Chief Justice of India (CJI)**. Hence, **statement (3) is NOT correct**.
- A Selection Committee shall be formed by central government to appoint the Judicial Members and Expert Members.
- There are to be least 10 and maximum 20 full time Judicial members and Expert Members in the tribunal.

87. (d)

**Explanation:**

**National Plan for Conservation of Aquatic Eco-systems:**

- To avoid overlap and promote better synergies, National Lake Conservation Plan (NLCP) and National Wetland Conservation Programme (NWCP) merged in February, 2013.

- The Wetlands Division of MoEF&CC looks after policies relating to the conservation and wise use of wetlands.
- The Ministry is currently implementing a **centrally sponsored scheme** namely, National Plan for Conservation of Aquatic Eco-systems (NPCA) for conservation and management of wetlands in the country on cost sharing basis between Central Government and respective State/UT Governments.
- The scheme covers various activities such as **interception**, diversion and treatment of wastewater, shoreline protection, **lake front development, in-situ cleaning i.e. desilting & dewatering, storm water management, bio-remediation, catchment area treatment, lake beautification, survey & demarcation, bio-fencing, fisheries development**, weed control, bio-diversity conservation, education and awareness creation, community participation, etc.

Hence, option (d) is correct.

88. (b)

Explanation:

- **Operationalization of Indian Biosafety Knowledge Portal:**
  - It was **launched in May 2019** through which the Department receives all new applications related to research proposals. This has made the whole process transparent, and time bound. **Hence, statement (1) is NOT correct.**
  - It is a **web-based portal**, with a major thrust to reach out to researchers, industry and other stakeholders to provide latest scientific information and regulatory guidance related to authorization of Genetically Modified Organisms/Living Modified Organisms (GMOs/LMOs) and products thereof.
  - **Institutional Biosafety Committee:** This committee has been delegated authority to take decisions on applications of import, export and exchange of GMOs and product thereof for R&D purposes under the **Environment (Protection) Act 1986**. **Hence, statement (2) is correct.**

89. (c)

Explanation:

- **Globally Important Agricultural Heritage Systems (GIAHS)** was started by the Food and Agriculture Organization (FAO) of the United Nations to safeguard and support the **world's agricultural heritage systems.**

- GIAHS are outstanding landscapes of aesthetic beauty that combine agricultural biodiversity, resilient ecosystems and a valuable cultural heritage.
- **Three recognized GIAHS sites in India:**
  - Kuttanad Below Sea Level Farming System of **Kerala.**
  - Koraput Traditional Agriculture of **Odisha.**
  - Pampore Saffron Heritage of **Kashmir.**

Hence, option (c) is correct.

90. (c)

Explanation:

- The formal agreement at the **19th Conference of the Parties (COP 19)** to the **United Nations Framework Convention on Climate Change (UNFCCC)** in Warsaw, Poland, in 2013, led to the **establishment of the Loss & Damage fund.**
- This fund was specifically created to provide financial and technical assistance to **economically developing nations** that were incurring Loss and Damage due to climate change.

Hence, option (C) is correct.

91. (a)

Explanation:

- **Biofouling**, the attachment of **living organisms to artificial surfaces**, is a seemingly innocuous process that nonetheless threatens the health of the world's oceans. The organisms can travel attached to shipping hulls and other equipment, thus entering new environments around the world as invasive aquatic species (IAS).
- These invasive species can wreak havoc in the areas of environmental health, ecosystem services, fishing and aquaculture. Biofouling can also damage the equipment it accumulates on, reducing the efficiency of shipping and contributing to climate change.
- **GloFouling Partnerships:** In July 2011, the Marine Environment Protection Committee (MEPC) of the **International Maritime Organization (IMO)** adopted the Guidelines for the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species (IMO Biofouling Guidelines) – a set of voluntary guidelines meant to provide a globally consistent approach to the management of biofouling. The IMO Biofouling Guidelines have been supplemented



by the Guidance for Minimizing the Transfer of Invasive Aquatic Species as Biofouling (Hull Fouling) for Recreational Craft. **Hence, statement (1) is correct, and statement (2) is NOT correct.**

- The **GEF-UNDP-IMO** GloFouling Partnerships project assists developing countries to implement the IMO Biofouling Guidelines and other best management practices. Part of this goal is to work towards a consistent regional approach to biofouling management to minimize the transfer of IAS.
- Set up to tackle the issue of biofouling in developing regions across the world, GloFouling Partnerships is part of the wider efforts by the International Maritime Organization (IMO), in collaboration with the United Nations Development Programme (UNDP) and the Global Environment Facility (GEF), to protect marine ecosystems from the negative effects of invasive species.
- Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) is joining global efforts to stop the impact of invasive species across maritime industries. Improved biofouling management also aims to help drive progress towards meeting multiple UN Sustainable Development Goals (UN SDGs).

**92. (b)**

**Explanation:**

- **ISRO** is establishing a second spaceport in **Kulasekarapattinam, Tamil Nadu**, dedicated to **Small Satellite Launch Vehicles (SSLVs)** developed by the private sector. **Hence, statement (1) is NOT correct.**
- The SSLV is a cost-effective, flexible launch vehicle capable of deploying around 500kg satellites in a 500-km orbit.
- Kulasekarapattinam is a town in the Thoothukudi district of Tamil Nadu.
- It was an ancient port dating to the 1<sup>st</sup> century AD and was contemporaneous to the existence of **Kollam, Cheran, and Pandyan ports**. **Hence, statement (2) is correct.**

**93. (d)**

**Explanation:**

- Three indigenous products from **Arunachal Pradesh** – Yak Churpi, Khamti rice, and Tangsa textile – have received the Geographical Indication (GI) tag from the GI Registry.

- Arunachal **Yak Churpi** is derived from the milk of the Arunachali yak, a rare breed found primarily in the West Kameng and Tawang districts of Arunachal Pradesh.
- This milk is obtained from yaks reared by **Brokpas**, a tribal community known for their expertise in yak husbandry.
- These pastoralists practice seasonal migration, taking their yaks to higher altitudes during summers and descending to mid-altitude mountainous regions in winters, as **yaks cannot survive at lower altitudes during summer**.
- **Health Benefits and Usage: Churpi is rich in proteins** and serves as a vital source of nutrition in the vegetation-scarce, cold, and hilly mountainous regions of Arunachal Pradesh.
- **Khaw Tai**, a chewy sticky rice variety, hails from the Namsai region and is cultivated by traditional Khampti tribal farmers. It is also called khamti rice.
- The **Tangsa Textile** products crafted by the Tangsa tribe of Changlang district are renowned for their exotic designs and vibrant colors.

**Hence, option (d) is correct.**

**94. (b)**

**Explanation:**

- **The Protected Area coverage in the country has been steadily increasing.** The coverage of Protected Areas which was **4.90%** of country's geographical area in 2014 has now increased to **5.03%**. This includes an increase in Protected Areas in the country from 740 with area of 1,61,081.62 sq. kms. in 2014 to present 981 with an area of 1,71,921 sq. kms. **Hence, statement (1) is correct.**
- **Population of several species like Tiger, Asiatic Lion, Greater one Horned Rhinoceros, Asian elephants, etc. increased.** Wildlife health is being addressed to aggressively monitor zoonotic diseases. **Hence, statement (2) is NOT correct.**
- India has taken a leadership role in conservation of migratory birds along the Central Asian Flyway and had organized a two-day workshop in October 2021, with Central Asian Flyway (CAF) Range countries on conservation of migratory birds along the Central Asian Flyway.
- The Ministry of Environment, Forest & Climate Change has released 'Guidelines for sustainable ecotourism in



forest and wildlife areas-2021' in October 2021. These guidelines emphasise on participation of local community in ecotourism activities.

- The number of Ramsar sites (Wetlands of International Importance) in India have increased to **80** as of January 2024. **India has the largest number of Ramsar sites in South Asia. Hence, statement (3) is correct.**

**95. (b)**

**Explanation:**

- Tanzania is an **East African** country known for its vast wilderness areas. **Hence, statement (1) is NOT correct.**
- They include the plains of **Serengeti National Park**, populated by the “**big five**” game (elephant, lion, leopard, buffalo, rhino), and **Kilimanjaro National Park**, home to Africa’s highest mountain. Hence, **statement (2) is correct.**

**96. (c)**

**Explanation:**

- National Crime Records Bureau (NCRB) was set up in 1986 to function as a **repository of information on crime and criminals** to assist the investigators in linking the crime to the perpetrators based on the recommendations of the **Tandon Committee, National Police Commission (1977-1981) and the Ministry of Home Affairs (MHA) Taskforce (1985).**
  - It is part of the **MHA and is headquartered in New Delhi.**
- It also acts as a “**national warehouse**” for the **fingerprint records** of Indian and foreign criminals and assists in locating interstate criminals through fingerprint search. **Hence, statement (1) is correct.**
- **Environment-Related Crime:**
- According to NCRB’s Crime in India 2022 report, the total number of **environmental crimes in India decreased by around 18% in 2022**, compared to 2021. **Hence, statement (2) is correct.**
  - Environment-related offenses include violations under seven acts: The Forest Act, 1927; Forest Conservation Act, 1980; The Wildlife Protection Act, 1972; The Environmental (Protection) Act, 1986; Air (Prevention and Control of Pollution) Act, 1981; Water (Prevention & Control of Pollution) Act, 1974; The Noise Pollution (Regulation and Control) Rules, 2000; and National Green Tribunal Act, 2010.

**97. (a)**

**Explanation:**

- In **Anoop Baranwal vs Union of India** – a judgment delivered on March 2, 2023 – a Constitution Bench of the Supreme Court unanimously held that the **selection of the Chief Election Commissioner (CEC) and the Election Commissioners** would be done by a three-member Committee consisting of the Prime Minister, the Leader of the Opposition (or the leader of the largest opposition party in Parliament), and the Chief Justice of India. The Court, thus, altered the present mode of selection, where the CEC is appointed by the President, acting on the advice of the Prime Minister.

**Hence, option (a) is correct.**

**98. (b)**

**Explanation:**

**Gulf Cooperation Council (GCC):**

- GCC was **established by an agreement** concluded in 1981 among **Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates (UAE)** in view of their special relations, geographic proximity, similar political systems based on Islamic beliefs, joint destiny and common objectives. **Hence, option (b) is correct.**
- The **structure** of the GCC consists of the Supreme Council (the highest authority), the Ministerial Council and the Secretariat General. The **Secretariat** is located in **Riyadh**, Saudi Arabia.
- It is a **political, economic, social, and regional organisation** according to its charter.



99. (c)

**Explanation:**

- Sedition laws were **enacted in 17<sup>th</sup> century England** when lawmakers believed that **only good opinions of the government should survive**, as bad opinions were detrimental to the government and the monarchy.
- The law was originally drafted **in 1837 by Thomas Macaulay, the British historian-politician**, but was **inexplicably omitted when the Indian Penal Code (IPC) was enacted in 1860**.
- **Section 124A was inserted in 1870** by an amendment introduced **by Sir James Stephen** when need was felt for a specific section to deal with the offence. **Hence, statement (1) is correct.**
  - It was one of the many draconian laws enacted to stifle any voices of dissent at that time.
- Writings of leaders like **Mahatma Gandhi, Lokmanya Tilak, and Jogendra Chandra Bose** were suppressed, and they were tried under sedition law for their comments on the British rule. **Hence, statement (2) is correct.**

100. (a)

**Explanation:**

- The Telecommunications Act, 2023, has not replaced the Telecom Regulatory Authority of India (TRAI) Act, 1997. Instead, the Act has replaced three older laws: the

Telegraph Act of 1885, the Indian Wireless Telegraphy Act of 1933, and The Telegraph Wires (Unlawful Possession) Act, 1950. **Hence, statement (1) is NOT correct.**

- The **Act amends the TRAI Act** to also allow individuals with at least 30 years of professional experience to serve as the chairperson, and at least 25 years of professional experience to serve as members
- The **Universal Service Obligation Fund** has been established under the **1885 Act** to provide for telecom services in underserved areas.
- The Act retains this provision, **renames the fund as Digital Bharat Nidhi**, and also allows its use for research and development. **Hence, statement (2) is correct.**
- In order to bring in functional clarity and strengthen the regulatory framework and the disputes settlement mechanism in the telecommunication sector, **the TRAI Act of 1997** was amended in the year 2000 and Telecom Disputes Settlement and Appellate Tribunal (TDSAT) was set up to adjudicate disputes and dispose of appeals with a view to protect the interests of service providers and consumers of the telecom sector and to promote and ensure orderly growth of the telecom sector. **Hence, statement (3) is NOT correct.**