TBC : 23/23/BET

Booklet Sr. No.

ENVIRONMENT SCIENCE

PAPER II

Roll No. | | | | | | | | |

(To be filled by the Candidate)

Time Allowed : 2 Hours] [Maximum Marks : 200

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

Instruction for the Candidates

1. Write your Roll Number in the space provided on the top of this page. Do not write anything else on the Test Booklet except in the space provided for rough work.
2. This paper consists of ***one hundred*** **(100)** multiple-choice type of questions. ***All*** questions carry equal marks.
3. At the commencement of the examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below :
   (***i***) **To have access to the Question Booklet, tear off the paper seal on the edge of this cover page. Do not accept a booklet without sticker-seal and do not accept an open booklet.**
   (***ii***) **Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.**
4. Each item has four alternatives response marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item completely with **Blue/Black ball point pen** as shown below. H.B. Pencil should not be used in blackening the circle to indicate responses on the answer sheet.

   Example : (A) ● (C) (D) Where (B) is correct response.
5. Your responses to the each item are to be indicated in the **OMR** Sheet provided to you only. If you mark your response at any place other than in the circle in the OMR Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough work is to be done in the end of this booklet.
8. **If you write your Name, Roll Number, Phone Number or put any mark on any part of the OMR Sheet, except for the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, such as change of response by scratching or using white fluid, you will render yourself liable to disqualification.**
9. You have to return the original OMR Sheet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are however, allowed to carry original question booklet and duplicate copy of OMR Sheet on conclusion of examination.
10. **Use of any calculator or log table etc., is prohibited.**
11. **There are no negative marks for incorrect answers.**
12. **CARRYING AND USE OF ELECTRONICS/COMMUNICATION DEVICES IN EXAMINATION HALL IS NOT ALLOWED.**

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

1. What is the colour code of the container for collection of biohazard waste generated from hospital ?

(A) Red (B) Blue

(C) White (D) Green

2. The provisions for environmental protection in the Constitution was made in which Amendment Act and year ?

(A) 44th Amendment Act, 1976 (B) 55th Amendment Act, 1950

(C) 42nd Amendment Act, 1976 (D) 45th Amendment Act, 1960

3. The provisions of environmental protection in the Constitution was made under :

(A) Article 5-A

(B) Article 21-B

(C) Article 27-B (h)

(D) Article 48-A and Article 51-A (g)

4. The initial significant environmental protection legislation enacted in India was :

(A) Water Act (B) Air Act

(C) Environmental Act (D) Noise Pollution Rule 5

5. The legislation known as the Wildlife (Protection) Act was established in which year ?

(A) 1986 (B) 1974

(C) 1994 (D) 1972

6. What is the term for the mountain biomes ?

(A) Psamnobiomes (B) Orobiomes

(C) Cryobiomes (D) Pedobiomes

7. In her influential book, "Silent Spring," Rachel Carson raised concerns about the hazards associated with :

(A) Soil Erosion (B) Malaria

(C) Climate Change (D) DDT

8. In which Indian state is the Silent Valley National Park located, known for its significant biodiversity and the conservation movement associated with it ?

(A) Karnataka (B) Kerala

(C) Tamil Nadu (D) Maharashtra

9. In what year was the Air (Prevention and Control of Pollution) Act enacted in India, a legislation aimed at addressing and curbing air pollution ?

(A) 1972 (B) 1981

(C) 1967 (D) 1974

10. Among the following options, which surface is known for reflecting more sunlight, contributing to the phenomenon of increased albedo ?

(A) Forests (B) Deserts

(C) Oceans (D) Snow-covered areas

11. Which Indian State is home to the Orang National Park ?

(A) Chhattisgarh (B) West Bengal

(C) Assam (D) Meghalaya

12. What is the primary goal of sustainable development ?

(A) Rapid economic growth at any cost

(B) Maximizing short-term profits

(C) Meeting the needs of the present without compromising future generations' ability to meet their own needs

(D) Exploiting natural resources without considering environmental consequences

13. Which of the following statements is accurate regarding COP 28 ?

(A) COP 28 is a global conference focusing on sustainable development in Africa.

(B) COP 28 is the 28th Conference of Parties addressing climate change under the United Nations Framework Convention on Climate Change (UNFCCC).

(C) COP 28 primarily concentrates on ocean conservation and marine biodiversity.

(D) COP 28 is an annual meeting dedicated to discussing international trade policies.

14. The United Nations Conference on Sustainable Development (UNCSD) is also known as :

(A) Rio 2010 (B) Rio 2011

(C) Rio 2012 (D) Rio 2013

15. The Basel Convention primarily addresses which environmental issue ?

(A) Biological diversity

(B) Hazardous wastes and their disposals

(C) Persistent organic pollutants

(D) Ozone depleting

16. In the COP28 declaration, what specific initiatives were outlined to address climate change, and which key international agreements were emphasized for global cooperation ?

(A) Implementing comprehensive carbon pricing mechanisms and prioritizing the Paris Agreement

(B) Establishing a global fund for sustainable energy projects and reinforcing the Kyoto Protocol

(C) Introducing stringent emission reduction targets and promoting regional climate alliances

(D) Fostering biodiversity conservation and enhancing the effectiveness of the Montreal Protocol

17. What key geochemical process played a crucial role in the primary differentiation of Earth, leading to the formation of its core, mantle and crust ?

(A) Radiometric dating
(B) Photosynthesis
(C) Accretion
(D) Nuclear fission

18. In the context of Earth's thermal environment, which factor contributes significantly to the concept of steady state and equilibrium ?

(A) Solar radiation
(B) Greenhouse gas concentrations
(C) Ocean currents
(D) Seismic activity

19. What geological process is primarily responsible for the formation of igneous rocks, and what role does magma play in this process ?

(A) Metamorphism; pressure and heat
(B) Weathering; erosion and deposition
(C) Volcanism; cooling and solidification
(D) Sedimentation; compaction and cementation

20. Which atmospheric force is responsible for the development of the geostrophic wind field, and how does it influence wind patterns globally ?

(A) Coriolis force; affects wind direction
(B) Frictional force; increases wind speed
(C) Pressure gradient force; determines wind speed
(D) Gravity; controls wind density

21. Among the climatic phenomena mentioned, which one is associated with the periodic warming of sea surface temperatures in the central and eastern equatorial Pacific Ocean ?

(A) Indian monsoon
(B) Western disturbances
(C) El Niño
(D) La Niña

22. Regarding the concept of residence time, which natural cycle involves the movement of water between the atmosphere, land, and oceans ?

(A) Nitrogen cycle
(B) Hydrological cycle
(C) Carbon cycle
(D) Rock cycle

23. In the geophysical fields, what method is commonly used to study variations in Earth's magnetic field, providing insights into its internal structure ?

(A) Seismology
(B) Gravimetry
(C) Magnetic method
(D) Geodesy

24. What is the primary factor influencing the seasonality of Earth's climate and the occurrence of different seasons ?

(A) Axial tilt
(B) Orbital eccentricity
(C) Solar irradiance
(D) Ozone concentration

25. In the formation of metamorphic rocks, which process involves the alteration of existing rocks due to changes in temperature and pressure within the Earth's crust ?

(A) Sedimentation (B) Erosion

(C) Metamorphism (D) Volcanism

26. What is the primary source of energy for Earth's energy budget and the driving force behind climate and atmospheric processes ?

(A) Geothermal energy (B) Nuclear fusion

(C) Solar radiation (D) Fossil fuel combustion

27. In which state is the Clouded Leopard National Park situated ?

(A) Jammu & Kashmir (B) Uttarakhand

(C) Sikkim (D) Tripura

28. Among the options provided, which is not a characteristic feature of Eutrophic lakes ?

(A) They are generally occupied by blooms

(B) They have high plant nutrient flux

(C) They have low primary productivity

(D) They are dominated by blue-green algae

29. The Lawachara National Park (LNP) is located in which country ?

(A) Sri Lanka (B) Bangladesh

(C) Nepal (D) Bhutan

30. Where is the Shahid Chandra Shekhar Azad Bird Sanctuary (SCSABS) located ?

(A) Madhya Pradesh (B) Uttar Pradesh

(C) Jharkhand (D) Himachal Pradesh

31. The "Equator Prize," awarded to acknowledge exceptional community initiatives in reducing poverty through biodiversity conservation and sustainable use, is conferred by which organization ?

(A) United Nations Environment Programme

(B) United Nations Development Programme

(C) World Food Organization

(D) World Bank

32. Identify the incorrectly matched pair among the following :

(A) Chandertal Wetland – Himachal Pradesh

(B) Pangong Tsar – Jammu & Kashmir

(C) Pichola Lake – Rajasthan

(D) Kolleru Wetland – Karnataka

33. Project Elephant, initiated in 1992 and responsible for declaring 24 elephant reserves in 12 States, aim to protect wild elephant populations and develop their habitat. In how many states do wild elephants exist India ?

(A) 12 (B) 14

(C) 17 (D) 18

34. What are the three species collectively referred to as chondrichthyans ?

(A) Sharks, Rays, Skates (B) Dolphins, Whales, Porpoises

(C) Salmon, Trout, Sturgeon (D) Tuna, Mackerel, Swordfish

35. Which type of vegetation found on rocks and trees could serve as a low-cost method to monitor urban pollution ?

(A) Moss (B) Lichen

(C) Ferns (D) Algae

36. Which physico-chemical characteristic primarily determines the classification of fossil fuels ?

(A) Carbon content (B) Hydrogen content

(C) Sulphur content (D) Volatility index

37. Which of the following is used as antiknock compound in gasoline ?

(A) tetramethyl lead (B) tetraethyl lead

(C) trimethyl lead (D) triethyl lead

38. In the principles of Ocean Thermal Energy Conversion, which temperature gradient is essential for efficient power generation ?

(A) Surface water and deep-sea water

(B) Equator and poles

(C) Ocean floor and surface

(D) Troposphere and stratosphere

39. The "Nagoya Protocol" is related to which of the following ?

(A) Climate change mitigation

(B) Conservation of wetlands

(C) Access and benefit-sharing in genetic resources

(D) Nuclear non-proliferation

40. Which method involves the thermochemical conversion of biomass into biochar under limited oxygen conditions ?

(A) Anaerobic digestion (B) Pyrolysis

(C) Gasification (D) Fermentation

41. Which type of nuclear reactor utilizes heavy water (deuterium oxide) as a moderator and coolant ?

(A) Pressurized Water Reactor (PWR)

(B) Boiling Water Reactor (BWR)

(C) Fast Breeder Reactor (FBR)

(D) CANDU reactor

42. Which of the following pairs are correctly matched ?

	Pollutant	**Disease**
(1)	Arsenic	Skin Cancer
(2)	Cadmium	Itai-Itai
(3)	Lead	Displexia

Select the correct answer from the following codes :

(A) Only (1)

(B) Only (1) and (2)

(C) Only (2) and (3)

(D) (1), (2) and (3)

43. The phenomenon of accumulation of non-biodegradable pesticides in human beings is called :

(A) Biomagnification (B) Bioaccumulation

(C) Biodegradation (D) Bioremediation

44. Which among the following fertilizers is least likely to affect the soil pH ?

(A) Urea (B) Rock phosphate

(C) Ammonia (D) Muriate of potash

45. What is Carbon Levy ?

(A) It's a tax levied on jet and shipping fuel to finance climate change mitigation

(B) It's a tax levied on carbon fuel

(C) It's a tax levied on the production of fossil fuel and coal

(D) It's a tax levied on the production of coal only

46. The Chenchu people in India have been actively involved in the protection of wildlife in which among the following protected areas ?

(A) Nagarjunasagar Srisailam (Andhra Pradesh)

(B) Similipal (Odisha)

(C) Indravati, Udanti-Sitanadi (Chhattisgarh)

(D) Palamu (Jharkhand)

47. True or False : Leslie's matrix model is primarily used for modeling population growth in plants, considering factors like seed production and germination.

(A) True (B) False

(C) True and False both (D) Neither True nor False

48. Leslie's matrix model is predominantly applied to model population growth dynamics in animal species :

(A) True and False both (B) False

(C) True (D) Neither True nor False

49. Which of the following sensors is not used in the remote sensing satellite ?

(A) Biosensor (B) Thermal sensor

(C) Electromagnetic sensor (D) Acoustic sensor

50. In a pond ecosystem, which one of the following are the consumers in the heterotrophic layer ?

(A) Spirogyra (B) Fungi

(C) Benthic insects (D) Diatoms

51. **Assertion (A) :** The depletion of the ozone layer is a matter of concern.

Reason (R) : The ozone layer serves as a protective shield against harmful ultraviolet (UV) radiation on Earth.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A)

(B) Both (A) and (R) are true and (R) is the not correct explanation of (A)

(C) Reason is true but assertion is false

(D) Both (A) and (R) are true but (A) is not correct explanation of (R)

52. **Assertion (A) :** Deforestation is a contributing factor to climate change.

Reason (R) : Trees play a role in regulating the Earth's climate by absorbing carbon dioxide and releasing oxygen.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A)

(B) Both (A) and (R) are true but (A) is not correct explanation of (R)

(C) Reason is true but assertion is false

(D) Both (A) and (R) are true and (R) is the correct explanation of (A)

53. **Assertion (A) :** The eutrophication of water bodies has the potential to cause the demise of aquatic organisms.

Reason (R) : Eutrophication involves the excessive growth of algae and other plants in water bodies, triggered by elevated nutrient levels.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A)

(B) Both (A) and (R) are true but (A) is not correct explanation of (R)

(C) Reason is true but assertion is false

(D) Both (A) and (R) are true and (R) is the correct explanation of (A)

Below given are match the following type questions, choose right answer :

54.

(*a*) Acid rain	(*i*) Burning of fossil fuels
(*b*) Ozone depletion	(*ii*) Chlorofluorocarbons (CFCs)
(*c*) Smog	(*iii*) Vehicle emissions and industrial processes
(*d*) Particulate matter	(*iv*) Burning of wood and coal

Answer :

	(*a*)	(*b*)	(*c*)	(*d*)
(A)	(*iv*)	(*ii*)	(*i*)	(*iii*)
(B)	(*i*)	(*ii*)	(*iii*)	(*iv*)
(C)	(*ii*)	(*i*)	(*iii*)	(*iv*)
(D)	(*iv*)	(*ii*)	(*iii*)	(*i*)

55. (*a*) Eutrophication — (*i*) Untreated human waste

(*b*) Oil spills — (*ii*) Tanker accidents

(*c*) Industrial wastewater — (*iii*) Factories and sewage treatment plants

(*d*) Sewage — (*iv*) Agricultural runoff

Answer :

	(*a*)	(*b*)	(*c*)	(*d*)
(A)	(*iv*)	(*ii*)	(*i*)	(*iii*)
(B)	(*i*)	(*ii*)	(*iii*)	(*iv*)
(C)	(*ii*)	(*i*)	(*iii*)	(*iv*)
(D)	(*iv*)	(*ii*)	(*iii*)	(*i*)

56. (*a*) Deforestation — (*i*) Logging and agriculture

(*b*) Mining — (*ii*) Wind and water

(*c*) Solid waste — (*iii*) Extraction of minerals and metals

(*d*) Soil erosion — (*iv*) Garbage and trash

Answer :

	(*a*)	(*b*)	(*c*)	(*d*)
(A)	(*i*)	(*iii*)	(*iv*)	(*ii*)
(B)	(*i*)	(*ii*)	(*iii*)	(*iv*)
(C)	(*ii*)	(*i*)	(*iii*)	(*iv*)
(D)	(*iv*)	(*ii*)	(*iii*)	(*i*)

57.

(*a*)	Global warming	(*i*)	Burning of fossil fuels
(*b*)	Sea level rise	(*ii*)	Melting glaciers and ice sheets
(*c*)	Ocean acidification	(*iii*)	Absorption of carbon dioxide by the oceans
(*d*)	Extreme weather events	(*iv*)	Changes in atmospheric circulation patterns

Answer :

	(*a*)	(*b*)	(*c*)	(*d*)
(A)	(*ii*)	(*iii*)	(*iv*)	(*i*)
(B)	(*i*)	(*ii*)	(*iii*)	(*iv*)
(C)	(*ii*)	(*i*)	(*iii*)	(*iv*)
(D)	(*i*)	(*iii*)	(*iv*)	(*ii*)

58.

(*a*)	Solar power	(*i*)	Falling water to generate electricity
(*b*)	Wind energy	(*ii*)	Heat from the Earth's core
(*c*)	Hydropower	(*iii*)	Air current
(*d*)	Geothermal energy	(*iv*)	Sunlight

Answer :

	(*a*)	(*b*)	(*c*)	(*d*)
(A)	(*i*)	(*iii*)	(*iv*)	(*ii*)
(B)	(*i*)	(*iii*)	(*ii*)	(*iv*)
(C)	(*iv*)	(*iii*)	(*i*)	(*ii*)
(D)	(*ii*)	(*iii*)	(*iv*)	(*i*)

59.

(*a*)	Habitat protection	(*i*) Clean water and sanitation
(*b*)	Species recovery	(*ii*) Restoring populations of endangered species
(*c*)	Pollution prevention	(*iii*) Creating protected areas for wildlife
(*d*)	Sustainable development Goal 6	(*iv*) Reducing the amount of pollution produced

Answer :

	(*a*)	(*b*)	(*c*)	(*d*)
(A)	(*i*)	(*iii*)	(*iv*)	(*ii*)
(B)	(*iii*)	(*ii*)	(*iv*)	(*i*)
(C)	(*iv*)	(*i*)	(*iii*)	(*ii*)
(D)	(*i*)	(*iii*)	(*ii*)	(*iv*)

60.

(*a*)	Keystone Species	(*i*) Gradual and predictable changes in the composition of an ecosystem over time
(*b*)	Biomagnification	(*ii*) Interaction between two different species living in close association
(*c*)	Symbiosis	(*iii*) Species crucial for maintaining the balance of an ecosystem
(*d*)	Succession	(*iv*) Increase in the concentration of toxins in organisms as one moves up the food chain

Answer :

	(*a*)	(*b*)	(*c*)	(*d*)
(A)	(*i*)	(*iii*)	(*iv*)	(*ii*)
(B)	(*iii*)	(*iv*)	(*ii*)	(*i*)
(C)	(*iv*)	(*i*)	(*iii*)	(*ii*)
(D)	(*i*)	(*iii*)	(*ii*)	(*iv*)

61. (*a*) Normal human conversation (*i*) 40-50 dB

(*b*) City with heavy traffic (*ii*) 80-90 dB

(*c*) Jet aircraft and explosion (*iii*) 140-150 dB

(*d*) Silent environment (*iv*) 30 dB

Answer :

	(*a*)	(*b*)	(*c*)	(*d*)
(A)	(*i*)	(*iii*)	(*iv*)	(*ii*)
(B)	(*iii*)	(*iv*)	(*ii*)	(*i*)
(C)	(*iv*)	(*i*)	(*iii*)	(*ii*)
(D)	(*i*)	(*ii*)	(*iii*)	(*iv*)

62. Which of the following sequences accurately represents the flow of energy within an ecosystem ?

(A) Consumers - Decomposers - Producers

(B) Producers - Decomposers - Consumers

(C) Producers - Consumers - Decomposers

(D) Decomposers - Consumers - Producers

63. Which rainwater harvesting method is suitable for an individual homeowner ?

(A) Establishment of a new water body

(B) Rainwater harvesting from rooftops

(C) Construction of recharge trenches

(D) Construction of sizeable storage tanks

64. Choose the suspended growth method used in biological treatment from the options provided :

(A) Activated sludge process (B) Trickling filter

(C) Rotating biological contactor (D) Anaerobic filter

65. Article 51(A) of the Indian Constitution declares that :

(A) The state's foremost responsibility is to enhance public health.

(B) The state is mandated to safeguard and enhance the environment.

(C) The state's primary duty is to elevate the standard of living.

(D) Citizens are obligated to protect and enhance the natural environment.

66. The balanced equation is :

$2H_2O_2 + 2KMnO_4 + H_2SO_4 \rightarrow 2K_2SO_4 + 2MnSO_4 + 2H_2O + O_2 2H_2O_2 + 2KMnO_4 + H_2SO_4 \rightarrow 2K_2SO_4 + 2MnSO_4 + 2H_2O + O_2$

Now, compare the coefficients with the given options :

(A) 1 1 1 1 1 1 1 (B) 1 2 3 1 2 4 3

(C) 2 5 3 2 1 8 5 (D) 5 2 3 1 2 8 5

67. Geochemical weathering can be understood as :

(A) The transformation of clay minerals and CO_2 into quartz and Al_2O_3.

(B) The conversion of primary silicate, CO_2 and H_2O into clay minerals, cations, HCO_3^-, H_4SiO_4 and H^+.

(C) The alteration of primary silicate in the presence of H_2O, resulting in Al_2O_3, SiO_2, CaO, and H^+.

(D) The weathering of clay minerals with H_2O, producing Fe_2O_3, Al_2O_3, SiO_2 and CaO.

68. **Assertion (A) :** Smog episodes are frequent in winters in urban areas.

Reason (R) : The burning of biomass for heating purposes or warmth increases significantly during winters.

Choose the correct answer :

(A) (A) is true, but (R) is false

(B) Both (A) and (R) are false.

(C) Both (A) and (R) are true, and (R) is the correct explanation of (A)

(D) Both (A) and (R) are true, but (R) is not the correct explanation of (A)

69. Given the following statements, identify the two statements that can both be true but cannot both be false :

Statements :

(*a*) Himachal Pradesh experiences heavy snowfall in winter.

(*b*) Most regions in Himachal Pradesh have a temperate climate.

(*c*) The higher altitudes in Himachal Pradesh receive less rainfall.

(*d*) Every part of Himachal Pradesh faces extreme heat during summers.

Answer :

(A) (*a*) and (*d*)

(B) (*b*) and (*c*)

(C) (*a*) and (*b*)

(D) (*a*) and (*c*)

70. Given the following statements, identify the two statements that can both be true but cannot both be false :

Statements :

(*a*) Pine and deodar forests are commonly found in Himachal Pradesh.

(*b*) Himachal Pradesh is not prone to landslides due to its topography.

(*c*) Apple orchards are a significant part of Himachal Pradesh's agriculture.

(*d*) All regions in Himachal Pradesh have a uniform distribution of flora and fauna.

Answer :

(A) (*a*) and (*d*)

(B) (*b*) and (*c*)

(C) (*a*) and (*b*)

(D) (*a*) and (*c*)

71. Given the following statements, identify the two statements that can both be true but cannot both be false :

Statements :

(*a*) Himachal Pradesh is known for its diverse range of wildlife.

(*b*) Snow leopards are commonly found in the lower altitudes of Himachal Pradesh.

(*c*) The Great Himalayan National Park is a UNESCO World Heritage Site in Himachal Pradesh.

(*d*) All rivers in Himachal Pradesh have a consistent flow throughout the year.

Answer :

(A) (*a*) and (*d*)

(B) (*b*) and (*c*)

(C) (*a*) and (*b*)

(D) (*a*) and (*c*)

72. Given the following statements, identify the two statements that can both be true but cannot both be false :

Statements :

(*a*) The Dhauladhar Range is part of the outer Himalayas in Himachal Pradesh.

(*b*) The state is home to the famous Dal Lake.

(*c*) Himachal Pradesh experiences a tropical climate throughout the year.

(*d*) The town of Solan is known as the "Mushroom City of India."

Answer :

(A) (*a*) and (*d*)

(B) (*b*) and (*c*)

(C) (*a*) and (*b*)

(D) (*a*) and (*c*)

73. Given the following statements, identify the two statements that can both be true but cannot both be false :

Statements :

(*a*) The Chail Cricket Ground in Himachal Pradesh is the highest cricket ground in the world.

(*b*) The state has a well-established ski resort in the town of Narkanda.

(*c*) Himachal Pradesh is located in the northeastern part of India.

(*d*) The Beas River is a major source of hydroelectric power in the state.

Answer :

(A) (*a*) and (*d*)

(B) (*b*) and (*d*)

(C) (*a*) and (*b*)

(D) (*a*) and (*c*)

74. Arrange column II in the correct sequence to match it with column I, and choose the correct answer from the codes given below :

Column I (Water Quality)	**Column II (pH Value)**
(*a*) Neutral	(*i*) 5
(*b*) Moderately acidic	(*ii*) 7
(*c*) Alkaline	(*iii*) 4
(*d*) Injurious	(*iv*) 8

Codes :

	(*a*)	(*b*)	(*c*)	(*d*)
(A)	(*ii*)	(*iii*)	(*i*)	(*iv*)
(B)	(*i*)	(*iii*)	(*ii*)	(*iv*)
(C)	(*ii*)	(*i*)	(*iv*)	(*iii*)
(D)	(*iv*)	(*ii*)	(*iii*)	(*i*)

75. **Assertion (A) :** Achieving environmental sustainability poses significant challenges.

Reason (R) : Our current understanding of environmental processes and the impact of various human choices on the environment is insufficient.

Choose the correct answer :

(A) Both (A) and (R) are correct, and (R) is the correct explanation of (A)

(B) Both (A) and (R) are correct, but (R) is not the correct explanation of (A)

(C) (A) is true, and (R) is false

(D) (A) is false, and (R) is true

76. Calculate $\Delta_r H^\circ_{373K}$ for the reaction

$$\frac{1}{2}N_2(g) + O_2(g) \rightarrow NO_2(g) \quad \Delta_r H^\circ_{298K} = -33.18 \text{ kJmol}^{-1}$$

Given :

$C_{p,m}(NO_2, g) = 37.20 \text{ JK}^{-1}\text{mol}^{-1}$

$C_{p,m}(O_2, g) = 29.36 \text{ JK}^{-1}\text{mol}^{-1}$

$C_{p,m}(N_2, g) = 29.13 \text{ JK}^{-1}\text{mol}^{-1}$

(A) 33.68 KJmol^{-1} (B) 36.38 KJmol^{-1}

(C) $-36.38 \text{ KJmol}^{-1}$ (D) $-33.68 \text{ KJmol}^{-1}$

77. The correct sequence for the bond order is :

(A) $N_2 > N_2^- > O_2 > O_2^-$ (B) $O_2 > N_2^- > N_2 > O_2^-$

(C) $N_2 > O_2 > N_2^- > O_2^-$ (D) $N_2 > N_2^- > O_2^- > O_2$

78. Consider the following reactions :

(*a*) $Fe(OH)_{2(s)} + 2e^- \rightarrow Fe_{(s)} + 2OH^-_{(aq)}$ $E^\circ = -0.877$ V

(*b*) $AgBr_{(aq)} + e^- \rightarrow Ag_{(s)} + Br^-_{(aq)}$ $E^\circ = -0.071$ V

(*c*) $Al^{3+} + 3e^- \rightarrow Al_{(s)}$ $E^\circ = -1.66$ V

The overall cell reaction for the cell in direction of spontaneous change would be :

(A) Cell with A and B Fe reduced & Cell with A and C Fe reduced

(B) Cell with A and B Fe reduced & Cell with A and C Fe oxidised

(C) Cell with A and B Fe oxidised & Cell with A and C Fe reduced

(D) Cell with A and B Fe oxidised & Cell with A and C Fe oxidised

79. Match the entries in Group-I with that in Group-II :

	Group-I (Protein Denaturing Agent)		**Group-II (Process)**
(P)	Change in pH	(1)	Rapid vibration of atoms, disruption of van der Waals forces
(Q)	Heavy metal ions	(2)	Replacing intramolecular H-bonds
(R)	Urea, Detergent	(3)	Precipitation with COO^- and SH groups of side chain
(S)	Heat, UV radiation	(4)	Disruption of H-bonding and ionic forces

	(P)	(Q)	(R)	(S)
(A)	(4)	(3)	(2)	(1)
(B)	(4)	(2)	(3)	(1)
(C)	(2)	(3)	(1)	(4)
(D)	(1)	(2)	(3)	(4)

80. In Gas Chromatography, helium is typically chosen as the carrier gas over nitrogen and hydrogen because :

(A) It possesses low viscosity
(B) It is inert
(C) It is readily available
(D) All of these

81. Choose the correct statement :

(A) HF > HCl > HBr > Hl (acid strength)

(B) $NH_3 < PH_3 < AsH_3$ (Bond angle)

(C) $HClO < HOClO < HOClO_2 < HOClO_3$ (oxidizing nature)

(D) PCl_5 exist as $[PCl_6]^- [PCl_4]^+$ in solid state

82. The threshold wavelength for photoelectric emission from lithium, above which no electrons are emitted, is 520 nm. Calculate the velocity of electrons emitted as the result of absorption of light at 360 nm.

(A) 6.1×10^6 ms^{-1} (B) 3.1×10^5 ms^{-1}

(C) 6.1×10^5 ms^{-1} (D) 3.1×10^6 ms^{-1}

83. The one-way flow of energy in an ecosystem is regulated by :

(A) The First Law of Thermodynamics

(B) The Second Law of Thermodynamics

(C) Both the first and second laws of thermodynamics

(D) None of the above

84. The term used to describe the variety of animal and plant species along with the genetic diversity within these species is ..... .

(A) Biosphere (B) Biodiversity

(C) Survival of the fittest (D) Biomagnification

85. Among the listed countries, which one has a population that is neither rapidly declining nor expanding ?

(A) England (B) Cuba

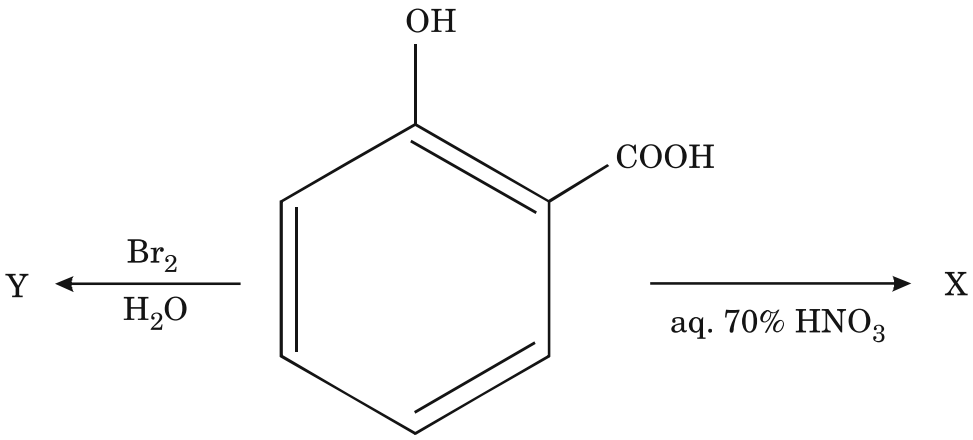
(C) Japan (D) United States

86. The venom of a cobra is :

(A) Antitoxin (B) Haemotoxin

(C) Neurotoxin (D) Antienzyme

87. Predict the products X and Y formed in the following reaction :



Answer :

(A) X = *o*-nitrophenol; Y = *p*-bromophenol

(B) X = 3-nitrosalicylic acid; Y = 4-bromosalicylic acid

(C) X = 5-nitrosalicylic acid; Y = 2,4,6-tribromophenol

(D) X = *p*-nitrophenol; Y = *o*-bromophenol

88. What is the main factor responsible for coral bleaching in marine ecosystems ?

(A) Overfishing and destructive fishing practices

(B) Pollution from industrial activities and oil spills

(C) Ocean acidification due to increased carbon dioxide levels

(D) Rising sea temperatures caused by climate change

89. Which ISO standard is specifically designed for energy management systems ?

(A) ISO 9001 (B) ISO 14001

(C) ISO 27001 (D) ISO 50001

90. Which remote sensing technique is appropriate for monitoring ocean temperatures and coastal regions ?

(A) LiDAR (B) Thermal infrared imaging

(C) Multispectral imaging (D) RADAR

91. The primary origin of BaP (Benzo-a-pyrene) in the atmospheric environment is from :

(A) Residential wood burning (B) Gasoline

(C) Coal tar (D) Cooked meat

92. Which method is employed to extract natural gas from shale formations ?

(A) Fracking (hydraulic fracturing) (B) Strip mining

(C) Open-pit mining (D) Solution mining

93. Which international program allows companies and countries to buy and sell carbon in order to meet emission reduction targets ?

(A) Paris Agreement

(B) Clean Development Mechanism (CDM)

(C) Kyoto Protocol

(D) Global Carbon Market

94. The Bharat Stage VI (BS-VI) emission norms in India aim to control emissions from which source ?

(A) Industrial manufacturing

(B) Power plants

(C) Vehicles

(D) Agricultural activities

95. Which organization developed the Green Rating for Integrated Habitat Assessment (GRIHA) for rating the sustainability of buildings ?

(A) LEED (B) TERI

(C) BREEAM (D) USGBC

96. Which international mechanism allows countries to earn carbon credits by investing in emission reduction projects in developing nations ?

(A) $REDD^{+}$ (B) GRIHA

(C) CDM (D) EIA

97. The Bhopal Gas Disaster in 1984 was caused by the release of which toxic gas from a pesticide plant ?

(A) Chlorine gas (B) Methyl isocyanate (MIC)

(C) Hydrogen cyanide (D) Sulfur dioxide

98. The Love Canal Disaster involved the improper disposal of which toxic substance, leading to environmental contamination ?

(A) Asbestos

(B) Lead

(C) Dioxins

(D) Hazardous waste including chemicals like benzene and dioxin

99. The Minamata Disaster, caused by mercury pollution, primarily affected which system of the human body ?

(A) Respiratory system (B) Nervous system

(C) Cardiovascular system (D) Digestive system

100. The Kugti Wildlife Sanctuary in Himachal Pradesh is home to various endangered species. What is the major threat to the biodiversity of this sanctuary ?

(A) Habitat loss due to deforestation

(B) Poaching and illegal wildlife trade

(C) Climate change

(D) Invasive alien species

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