

PART-B
ENVIRONMENTAL SCIENCE

51. Allopatric speciation occurs when :
- (A) Genetically unrelated populations inhabit the same geographical area
- (B) Genetically related populations inhabit the same geographical area
- (C) Genetically unrelated populations inhabit widely separated geographical area
- (D) Genetically related population inhabit widely.

52. Match the column - I with column - II and select the correct options from the given codes :

| Column - I | Column - II |
|-----------------|---|
| A. Eurythermal | (i) Able to tolerate narrow range of temperature |
| B. Stenothermal | (ii) A stage of suspended development |
| C. Conformers | (iii) Body temperature changes with ambient temperature |
| D. Dormancy | (iv) Able to tolerate wide range of temperature |

- (A) A-iv, B-i, C-iii, D-ii
- (B) A-iv, B-i, C-ii, D-iii
- (C) A-ii, B-iv, C-iii, D-i
- (D) A-i, B-ii, C-iii, D-iv

53. Following table summarizes the differences between natality and mortality. Select the incorrect ones :

| S.No. | Natality | Mortality |
|-------|---|---|
| (i) | Natality is a number of births per unit population per unit time. | It is number of deaths per unit population per unit time. |
| (ii) | It adds new individuals to the population. | It removes individuals from the population. |
| (iii) | It increases the size of population. | It decreases the size of population. |
| (iv) | It increases population density. | It reduces population density. |
| (v) | It is low when population size is small and high when population size is large. | It is high when population size is small and low when population size is large. |

- (A) (i) and (v)
- (B) (iii) and (iv)
- (C) (iv) only
- (D) (v) only

54. Arrange the following ecosystems in increasing order of their mean NPP (tons/ha/year) :

- A. Tropical deciduous forest
- B. Temperate coniferous forest
- C. Tropical rain forests
- D. Temperate deciduous forest
- (A) B < A < D < C
- (B) D < B < A < C
- (C) A < C < D < B
- (D) B < D < A < C

55. Study the following statements and select the incorrect ones :
- Pyramids of energy and yearly biomass production can never be inverted, since this would violate the laws of thermodynamics.
 - Pyramids of standing crop and number can be inverted, since the number of organisms at a time does not indicate the amount of energy flowing through the system.
 - There are certain limitations of ecological pyramids such as they do not take account the same species belonging to two or more trophic levels.
 - Saprophytes are not given any place in ecological pyramids even though they play a vital role in the ecosystem.
- (i) and (ii)
 - (iii) and (iv)
 - (ii) and (iii)
 - None of these
56. India has a greater ecosystem diversity than a Scandinavian country like Norway. What kind of diversity it represent?
- Species diversity
 - Ecological diversity
 - Genetic diversity
 - None of these
57. Which of the following is not a component of photochemical smog?
- Chlorofluorocarbon
 - Peroxyacetylnitrate (PAN)
 - Nitrogen oxide
 - Ozone
58. Find the incorrect statement
- BOD value of clean water is less than 5 ppm
 - The pH of Drinking water should be between 5.5-8.5
 - Carbon, sulphur and nitrogen oxides are the most widespread air pollutants
 - Dissolved oxygen concentration below 5 ppm is ideal for the growth of fish
59. Green chemistry means such reactions that :
- Produce color during reactions.
 - Reduce the use and production of hazardous chemicals.
 - Are related to the depletion of the ozone layer.
 - Study the reactions in plants.
60. Trivalent Chromium Waste is hazardous waste.
- True
 - False
 - Neither True Nor False
 - Can't be a certained.

61. Regulations for waste management is provided under subtitle C of
- (A) CERCLA
 - (B) NPL
 - (C) HPL
 - (D) RCRA
62. The descent of oceanic lithosphere into the mantle is the process of :
- (A) Accretion
 - (B) Subduction
 - (C) Divergence zone
 - (D) Contraction fault
63. Among the following, which describes Stefan-Boltzmann formula?
- (A) $M = \sigma/T^4$
 - (B) $M = \sigma-T^4$
 - (C) $M = \sigma+T^4$
 - (D) $M = \sigma*T^4$
64. Which of the following agents is responsible for turning the Taj Mahal yellow?
- (A) Sulphur
 - (B) Chlorine
 - (C) Sulphur dioxide
 - (D) Nitrogen dioxide
65. Which of the following is not a part of Sustainable Development Goal target to be achieved by 2030?
- (A) Providing free Primary and Secondary Schooling to all boys and girls.
 - (B) Universal access to a quality higher education.
 - (C) Equal access to affordable vocational training.
 - (D) Free Higher education to all.
66. Landslides can be as disastrous as earthquakes causing various types of damages like :
- (A) Killing of human beings.
 - (B) Blockage of river passage causing flood.
 - (C) Both correct.
 - (D) Both incorrect.
67. Which of the following statements are correct regarding Agenda 21?
1. Agenda 21 is an outcome of the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, in 1992.

2. It is a comprehensive blueprint of action to be taken in every area in which humans directly affect the environment.
3. The number 21 refers to an agenda for the 21st century.

Select the correct option from the codes given below:

- (A) Only 1 and 2
- (B) Only 2 and 3
- (C) Only 1 and 3
- (D) 1, 2 and 3

68. How is the value of COD compared to BOD?

- (A) Much higher
- (B) Zero
- (C) Much lower
- (D) Low

69. Biospheres reserves differ from National Parks and Wildlife Sanctuaries because in the former

- (A) Human beings are not allowed to enter
- (B) People are an integral part of the system
- (C) Plants are paid greater attention than the animals
- (D) Living organisms are brought from all over the world and preserved for prosperity

70. **Statement-A** : In a tropical rainforest, O-Horizon and A-Horizon of soil profile are shallow and Nutrient poor.

Statement-R : Excessive growth of micro-organisms in the soil depletes its organic content.

Consider these two statements - A (assertion) and R (reason) and answer accordingly:

- (A) If A is correct and R is its explanation
- (B) If A and R both correct but R is not its explanation
- (C) If A is correct but R is wrong
- (D) If A is wrong but R is correct

71. Read the given statements and select the correct options.

Statement 1 : Cow in India and Kangaroo in Australia (both herbivores) are ecological equivalents.

Statement 2 : the organism having similar niche in different geographical regions are known as ecological equivalents.

- (A) Both statement 1 and 2 are correct
- (B) Statement 1 is correct but statement 2 is incorrect
- (C) Statement 1 is incorrect but statement 2 is correct
- (D) Both statement 1 and 2 are incorrect

Directions : In the following questions, a statement of Assertion followed by statement of Reason.

Mark the correct choices as :

- (A) If both assertion and reason are true and reason is the correct explanation of assertion.
- (B) If both assertion and reason are true but the reason is not the correct explanation of assertion.
- (C) If assertion is true but reason is false.
- (D) If both assertion and reason are false.
72. **Assertion :** Small sized animals are rarely found in polar regions.
Reason : Small sized animals have larger surface area relative to their volume and they have to spend much energy to generate body heat through metabolism.
73. **Assertion :** The loss of biologically useful energy as heat with every energy transfer in a food chain is a consequence of the second law of thermodynamics.
Reason : Energy does not remain trapped permanently in any organism, it is either passed on to higher trophic level or becomes available to detritivores and decomposers after the organism dies.
74. **Assertion :** If the species-area relationships are analyzed among very large areas like the entire continents, the value of Z, that is, slope of line lies in the range of 0.1 to 0.2.
Reason : The value of Z, that is, slope of line of species area relationships lies in the range of 0.6 to 1.2 when analysis is done among small areas.
75. **Assertion :** An electrostatic precipitator (ESP) is a particulate collection device that removes dust and smoke particles from flowing air using the force of an induced electrostatic charge.
Reason : An ESP is a highly efficient device as it removes 99% of particulate matter present in the exhaust from a thermal power plant.
76. **Assertion :** Bharat stage IV emission norms have been in place since April 2010, for 4 wheelers in 13 mega cities of India.
Reason : Green muffler scheme refers to the plantation of trees and shrubs along road sides and its effective to control noise pollution only.
77. **Assertion :** Evancs refers to a scientific method of treating e-wastes in an environment friendly manner.
Reason : Recycling of e-wastes in developed countries often involves manual participation and exposes the workers to toxic substances present in e-wastes.

78. **Assertion :** External parasitism is generally marked by much more extreme specialization than internal parasitism.

Reason : The structure of internal parasite is usually very complex possessing suckers, reproductive organs etc.

79. **Assertion :** Offsite collection can be used to restock depleted populations reintroduce species in the wild and restore degraded habitats.

Reason : *In situ* conservation refers to the conservation of endangered species in their natural habitats.

80. **Assertion :** Ecology is basically concerned with four levels of biological organizations.

Reason : These are - organisms, populations, communities and biomes.

81. What happens when phosphorus, nitrates, and detergents in water lead to an acceleration in the growth of algae?

- (A) Extinction
- (B) Eutrophication
- (C) Increase in the number of fishes
- (D) Increase in the number of aquatic plants

82. Environmental ethics do not exert influence on a large range of disciplines.

- (A) True
- (B) False
- (C) Neither True Nor False
- (D) Cant be a certained.

83. The correct sequence of components through which energy may pass from initial source, through an ecosystem is :

- (A) sun - autotrophs - heterotrophs - environment - space
- (B) space - environment - heterotrophs - autotrophs - sun
- (C) sun - space - environment - heterotrophs - autotrophs
- (D) sun - space - environment - autotrophs - heterotrophs

84. Match and select the correct answer from codes given below :

| Components of atmospheric air | Percentage of volume |
|-------------------------------|----------------------|
| A. Nitrogen | I. 21 |
| B. Oxygen | II. 0.9 |
| C. Argon | III. 0.03 |
| D. Carbon dioxide | IV. 78.08 |

- | | A | B | C | D |
|-----|-----|-----|----|-----|
| (A) | III | IV | II | I |
| (B) | IV | III | I | II |
| (C) | IV | II | I | III |
| (D) | IV | I | II | III |

85. Match column I with column II and select the correct options from the given codes:

| Column I | Column II |
|---|-----------------------------------|
| A. Ladybird beetles feeding on insects | I. Mutualism |
| B. Barnacles growing on the back of a whale | II. Predation |
| C. Wasp pollinating the fig inflorescence | III. Competition |
| D. Lice living on skin of humans | IV. Commensalism V. Parasitism |

- (A) A - II, B - IV, C - I, D - V
 (B) A - IV, B - II, C - V, D - I
 (C) A - II, B - I, C - V, D - IV
 (D) A - III, B - II, C - I, D - IV

86. Select the correct sequence of succession in a pond.

- (A) Submerged plants → Floating plants → Reed swamp stage → Sedges
 (B) Floating plants → Submerged plants → Reed swamp stage → Sedges
 (C) Reed swamp stage → Sedges → Floating plants → Submerged plants
 (D) Sedges → Reed swamp stage → Floating plants → Submerged plants

87. Match the animals given in column A with their location in column B.

| Column A | Column B |
|----------------------|----------------|
| A. Dodo | I. Africa |
| B. Quagga | II. Russia |
| C. Thylacine | III. Mauritius |
| D. Stellar's sea cow | IV. Australia |

Choose the correct match from the following :

- (A) I - A, II - C, III - B, IV - D
 (B) I - D, II - C, III - A, IV - B
 (C) I - C, II - A, III - B, IV - D
 (D) I - C, II - A, III - D, IV - B

88. Read the given statements and select the correct option.

Statement 1 : Traffic jams are likely to cause giddiness, exhaustion, reduced vision etc.

Statement 2 : Carbon monoxide from vehicles causes these problems by reducing O₂-carrying capacity of hemoglobin.

- (A) Both statements 1 and 2 are correct
 (B) Statement 1 is correct but statement 2 is incorrect
 (C) Statement 1 is incorrect but statement 2 is correct
 (D) Both statements 1 and 2 are incorrect

89. Given below are four statements each with two blanks.

Select the option which correctly fills up the blank in any two statements.

(i) Bhopal gas disaster took place on _____ 1984 and this day is now observed as _____ day in India to make the anniversary of Bhopal gas disaster.

(ii) _____ is a biodegradable pollutant while _____ is a non-biodegradable pollutant.

(iii) When pollutants are released from a single point it is called _____ pollution but when it is over a large area then it is called _____ pollution.

(iv) _____ is the world's most problematic aquatic weed, introduced in India for its lovely flowers, also called as _____.

(A) (i) December 5, National pollution prevention; (iv) *Parthenium*, terror of Bengal

(B) (i) December 2, Bhopal gas tragedy; (ii) DDT, sewage

(C) (ii) Sewage, DDT; (iii) point source, non-point source

(D) (iii) Line source, fixed source; (iv) *Eichhornia*, tiger of Bengal

90. Match correctly the following and choose the correct options.

(i) Environment Protection Act A. 1974

(ii) Air Prevention and Control
of Pollution Act B. 1987

(iii) Water Act C. 1986

(iv) Amendment of Air Act to
include noise D. 1981

The correct match is :

(A) A – (iii), B – (iv), C – (i), D – (ii)

(B) A – (i), B – (iii), C – (ii), D – (iv)

(C) A – (iv), B – (i), C – (ii), D – (iii)

(D) A – (iii), B – (iv), C – (ii), D – (i)

91. The error of rejecting of null hypothesis, when it is true is known as :

(A) Type-I error

(B) Type-II error

(C) Type -III error

(D) Type-IV error

92. A crocodile had just eaten a lamb when a hawk saw the crocodile, attacked it and consumed it. The hawk is in ecological terms :

(A) A producer

(C) A primary consumer

(B) A secondary consumer

(D) A tertiary consumer

93. Which of the following measure is adopted to prevent environmental pollution due to Hg?
- (A) All chlor-alkali must stop using Hg electrodes and switch to new technology
- (B) All alkyl mercury pesticides must be banned
- (C) All other mercurial pesticides must be restricted to some selected areas
- (D) All correct.
94. Percentage of photosynthetically active radiation (PAR) that is captured by plants for synthesis of organic matter is :
- (A) 50 - 70%
- (C) 80 - 100%
- (B) 30 - 40%
- (D) 2 - 10%
95. Select the pairs of sedimentary biogeochemical cycles :
- I. Hydrogen cycle and water cycle
- II. Hydrogen cycle and Phosphorus cycle
- III. Phosphorus cycle and Sulphur cycle
- IV. Calcium cycle and magnesium cycle
- (A) I and II
- (B) II and III
- (C) III and IV
- (D) II and IV
96. What is common to the following techniques?
- I. In vitro fertilization
- II. Cryopreservation
- III. Tissue culture
- (A) All are *in situ* conservation methods
- (B) All are *ex situ* conservation methods
- (C) All require ultra-modern equipment and large space
- (D) All are methods of conservation of extinct organisms
97. Read the following statements and select the correct option :
- Statement-I :** Reforestation is the process of restoring a forest that once existed but was removed at some point of time in the past.
- Statement-II :** Reforestation may occur naturally in deforested area, however it can be speeded up by planting trees with due consideration to biodiversity that earlier existed in that area.
- (A) Both statements I and II are correct
- (B) Statement I is correct but statement II is incorrect
- (C) Statement I is incorrect but statement II is correct
- (D) Both statements I and II are incorrect.

98. Which of the following groups does not include the countries which contribute to 12 mega-diversity centers of the world?
- I. Mexico, Columbia and Brazil
 - II. China, Germany and Japan
 - III. Peru, Ecuador and Venezuela
 - IV. Madagascar Indonesia and Malaysia
- (A) I
(B) III
(C) II
(D) IV
99. Which of the following are correctly matched?
- I. Arsenic poisoning – Black-Foot disease
 - II. Secondary effluent treatment – Biological process
 - III. Pyrolysis – Solid soil waste disposal
 - IV. Tubifex – Water pollution indicator
 - V. Bio magnification – Degradable pollutants
- (A) I, II, III and V
(B) I, II, III, and IV
(C) I, III, IV and V
(D) I, II, IV and V
100. Which of the following is incorrect pair?
- (A) Tremor – Shaking of the ground
 - (B) Mantle – The semi-liquid layer of below the earth crust
 - (C) Focus – The spot underneath the surface of the earth at which earthquake originates
 - (D) Epicentre –The point vertically below the focus on the surface of earth.

ROUGH WORK

ROUGH WORK

Answer Key: Environment Science

| Q No | Answer |
|-------------|---------------|
| 51 | C |
| 52 | A |
| 53 | D |
| 54 | D |
| 55 | D |
| 56 | C |
| 57 | A |
| 58 | D |
| 59 | B |
| 60 | A |
| 61 | D |
| 62 | D |
| 63 | D |
| 64 | C |
| 65 | D |
| 66 | C |
| 67 | D |
| 68 | A |
| 69 | A |
| 70 | A |
| 71 | A |
| 72 | A |
| 73 | B |
| 74 | D |
| 75 | B |

| Q No | Answer |
|-------------|---------------|
| 76 | C |
| 77 | C |
| 78 | D |
| 79 | B |
| 80 | C |
| 81 | B |
| 82 | B |
| 83 | D |
| 84 | D |
| 85 | A |
| 86 | A |
| 87 | D |
| 88 | A |
| 89 | C |
| 90 | A |
| 91 | A |
| 92 | D |
| 93 | D |
| 94 | D |
| 95 | C |
| 96 | B |
| 97 | A |
| 98 | C |
| 99 | B |
| 100 | D |