

**UGC NET PAPER 2 DECEMBER 31, 2005 SHIFT 1 ENVIRONMENTAL SCIENCES QUESTION PAPER**

**Note :** This paper contains **fifty** (50) multiple-choice questions, each question carrying **two** (2) marks. Attempt **all** of them.

1. Air quality standards are based on :  
(A) Climate and topography (B) Ambient air quality alone  
(C) Dose of a pollutant (D) Method of measurement
2. The unleaded petrol, as an automotive fuel, should not have the lead levels exceeding :  
(A) 0.05 g/L (B) 0.15 g/L (C) 0.25 g/L (D) 0.50 g/L
3. A major part of air pollution load lies in :  
(A) Troposphere (B) Stratosphere (C) Thermosphere (D) Ionosphere
4. Which is the correct order of the degree of weathering of the following rocks :  
(A) Dunite > Basalt > Granite > Rhyolite  
(B) Basalt > Dunite > Granite > Rhyolite  
(C) Granite > Basalt > Dunite > Rhyolite  
(D) Rhyolite > Granite > Dunite > Basalt
5. Interior of the earth is inferred through :  
(A) Deep continental drilling (B) Deep ocean drilling  
(C) Seismic soundings (D) Heat flow measurements
6. The minimum thickness to be used in biodegradable carry bags should be :  
(A) 5 microns (B) 10 microns (C) 15 microns (D) 20 microns
7. The criteria indicators of water pollution are :  
(A) pH, COD, BOD, DO (B) pH, Coliform, COD, DO  
(C) Coliform, COD, BOD (D) BOD, DO, Coliform
8. The cation exchange capacity of silty loams is :  
(A) 0 – 1 (B) 1 – 5 (C) 5 – 15 (D) 15 – 30
9. Air Pollution Tolerance Index (APTI) of vegetation is calculated using :  
(A) Pb content, SO<sub>2</sub> content and NO<sub>x</sub> content in air  
(B) Ascorbic acid, total chlorophyll and pH of water content on vegetation  
(C) SPM, pH of water and soil types of the area  
(D) Landscape of the area ; SO<sub>2</sub> and NO<sub>x</sub> levels in air
10. The state having the largest forest cover in India is :  
(A) Andhra Pradesh (B) Orissa (C) Maharashtra (D) Chattisgarh
11. Coal mine workers are prone to victims of one of the following diseases :  
(A) Pneumoconiosis (B) Byssinosis (C) Asbestosis (D) Silicosis
12. The number of oxygen molecules required for the complete combustion of 1 molecule of propane is :  
(A) 2 (B) 3 (C) 4 (D) 5

13. Which one of the following is necessary for the growth and maintenance of animal bones and teeth :  
 (A) Hydrogen (B) Oxygen (C) Phosphates (D) Sulphur
14. Which of the following organisms are used as components of biofertilisers :  
 (A) Blue green algae only (B) Coliform bacteria and mushrooms  
 (C) N-fixing bacteria only (D) Blue green algae and N-fixing bacteria
15. Which one of the following photochemical reactions is correct :  
 (A)  $\text{SO}_2 \xrightarrow{h\nu} \text{SO}_2^*$  (B)  $\text{N}_2\text{O} + h\nu \longrightarrow \text{N}_2 + \text{O}^*$   
 (C)  $\text{O}_3 + h\nu \longrightarrow \text{O} + \text{O}_2$  (D)  $\text{O}_2 + h\nu \longrightarrow \text{O}_2 + e$
16. **Assertion (A):** CFCs destroy ozone molecules in stratosphere  
**Reason (R) :** CFCs have very high global warming potential  
 (A) Both (A) and (R) are true and (R) is the correct explanation of (A)  
 (B) Both (A) and (R) are true but (R) is *not* the correct explanation of (A)  
 (C) (A) is true ; (R) is false  
 (D) (A) is false ; (R) is true
17. Match the Lists I and II. Select the correct answer using the code given below the lists :
- | List - I                                            | List - II  |
|-----------------------------------------------------|------------|
| (a) Environmental Protection Act                    | (i) 1991   |
| (b) Air (Prevention and Control of Pollution) Act   | (ii) 1974  |
| (c) Water (Prevention and Control of Pollution) Act | (iii) 1981 |
| (d) Public Liability Insurance Act                  | (iv) 1986  |
- Code:**
- |     |       |       |      |       |
|-----|-------|-------|------|-------|
| (A) | (i)   | (ii)  | (iv) | (iii) |
| (B) | (iv)  | (iii) | (ii) | (i)   |
| (C) | (ii)  | (iv)  | (i)  | (iii) |
| (D) | (iii) | (i)   | (ii) | (iv)  |
18. 2 ppm of CO at 25°C and 760mm of Hg pressure is equivalent to :  
 (A) 1250  $\mu\text{g}/\text{m}^3$  (B) 1145  $\mu\text{g}/\text{m}^3$   
 (C) 2500  $\mu\text{g}/\text{m}^3$  (D) 2290  $\mu\text{g}/\text{m}^3$
19. 1 kW-hour of energy is equivalent to :  
 (A) 460 KCal (B) 1250 KCal (C) 860 KCal (D) 760 KCal
20. The dominant gas in biogas is :  
 (A)  $\text{CH}_4$  (B)  $\text{C}_2\text{H}_5$  (C)  $\text{CO}_2$  (D)  $\text{NO}_2$

21. Match the following lists I and II and select the correct answer using the code given below the lists :

**List - I**

(a) Fluvial  
(b) Shallow Marine  
(c) Glacial  
(d) Eolian

**List - II**

(i) Moraines  
(ii) Loess  
(iii) Oxbow lake  
(iv) Spits and Bar

**Code:**

|     |            |            |            |            |
|-----|------------|------------|------------|------------|
|     | <b>(a)</b> | <b>(b)</b> | <b>(c)</b> | <b>(d)</b> |
| (A) | (iii)      | (iv)       | (i)        | (ii)       |
| (B) | (i)        | (ii)       | (iii)      | (iv)       |
| (C) | (iv)       | (iii)      | (ii)       | (i)        |
| (D) | (iii)      | (iv)       | (ii)       | (i)        |

22. Which of the following pairs is **not** correctly matched :

|                       |   |                                      |
|-----------------------|---|--------------------------------------|
| (A) Tropical zone     | - | Hot, winterless                      |
| (B) Sub-tropical zone | - | Hot with cool winter                 |
| (C) Temperate zone    | - | Warm summer with pronounced winter   |
| (D) Alpine zone       | - | Long summer with short severe winter |

23. The hydraulic conductivity or the coefficient of permeability of which of the following media is the highest :

(A) Clay                      (B) Sand                      (C) Gravel                      (D) Sandstone

24. Aquatic organisms are very sensitive to :

(A) Salinity                      (B) pH                      (C) Temperature                      (D) Dissolved oxygen

25. Which of the following acts as a trigger for a landslide to occur :

(A) Vegetation loss                      (B) Rainfall  
(C) Animal movement                      (D) Vehicular movement

26. After sodium chloride, which of the following compounds has the maximum concentration in sea water :

(A) Magnesium sulphate                      (B) Calcium sulphate  
(C) Magnesium chloride                      (D) Potassium sulphate

27. The directions for the regulation, prohibition or the closure of any industry are given by :

(A) State government                      (B) Central government  
(C) State Pollution Control Board                      (D) Central Pollution Control Board

28. Match the lists I and II. Select the correct answer using the code given below the lists :

**List - I**

**(Category of Area)**

(a) Commercial area  
(b) Residential area  
(c) Industrial area  
(d) Silence zones

**List - II**

**(Daytime Noise standards in dB)**

(i) 75  
(ii) 50  
(iii) 65  
(iv) 55

**Code:**

|     |            |            |            |            |
|-----|------------|------------|------------|------------|
|     | <b>(a)</b> | <b>(b)</b> | <b>(c)</b> | <b>(d)</b> |
| (A) | (i)        | (ii)       | (iv)       | (iii)      |
| (B) | (iii)      | (iv)       | (i)        | (ii)       |
| (C) | (iv)       | (iii)      | (ii)       | (i)        |
| (D) | (ii)       | (i)        | (iv)       | (iii)      |

29. Which of the following sets has the maximum dispersion :
- (A) 10, 11, 12, 10, 11, 10, 10, 11, 10, 11 (B) 1, 2, 1, 2, 1, 2, 1, 2, 1, 2  
(C) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 (D) 5, 5, 6, 6, 5, 5, 6, 5, 6, 5
30. Which of the following methods is suitable for hypothesis testing :
- (A) Two way analysis of variance (B) t-test  
(C) Cluster Analysis (D) Correlation and regression
31. Box model is mainly employed for analysing the :
- (A) dispersal of atmospheric pollutants  
(B) Predictor and Prey populations  
(C) Birth and death rates  
(D) Discharge of a waste into groundwaters
32. The geometric mean of 2, 2, 3 and 3 is :
- (A) 6 (B)  $\sqrt{6}$  (C) 5 (D) 1.6
33. Match the Lists I and II. Select the correct answer using the code given below the lists :
- | List - I             |  | List - II             |  |
|----------------------|--|-----------------------|--|
| (a) Tropical forest  |  | (i) Sunderbans        |  |
| (b) Conifer forest   |  | (ii) Himachal Pradesh |  |
| (c) Mangroves        |  | (iii) Rajasthan       |  |
| (d) Deciduous forest |  | (iv) Silent valley    |  |
- Code:**
- |     | (a)  | (b)  | (c)  | (d)   |
|-----|------|------|------|-------|
| (A) | (i)  | (ii) | (iv) | (iii) |
| (B) | (ii) | (i)  | (iv) | (iii) |
| (C) | (i)  | (iv) | (ii) | (iii) |
| (D) | (iv) | (ii) | (i)  | (iii) |
34. Imhoff tank is used for :
- (A) Filtration and Flocculation (B) Sludge digestion and sedimentation  
(C) Demineralization (D) Distillation
35. A solar cell is basically a :
- (A) p type semiconductor (B) n type semiconductor  
(C) p-n diode (D) p-n-p transistor
36. The information system useful to identify the location of a point is :
- (A) GIS (B) GPS (C) Clinometer (D) Compass
37. The global warming potential of  $N_2O$  relative to  $CO_2$  is :
- (A) 25 (B) 10,000 (C) 0.5 (D) 230
38. The size distribution of aerosols in ambient urban environment tends to follow :
- (A) Normal distribution (B) Exponential distribution  
(C) Junge's distribution (D) Poisson distribution

39. The temperature required to fuse Deuterium and Tritium nuclei is of the order of :  
(A)  $\sim 10^5$  °k (B)  $\sim 10^8$  °k (C)  $\sim 10^4$  °k (D)  $\sim 10^6$  °k
40. Landfill sites can be permitted in :  
(A) wetlands  
(B) flood plains  
(C) habitats of endangered species and recharge zones for local drinking water supplies  
(D) abandoned mines with impermeable barrier at the bottom with a leachate recycling system
41. The satellite which has been put into orbit recently capable of producing high resolution thematic data is :  
(A) IRS - 2D (B) EDUSAT (C) RESOURCESAT (D) LANDSAT
42. The atmosphere is chemically homogenous upto an altitude of :  
(A) 10 km (B) 30 km (C) 50 km (D) 80 km
43. At which stage of an ecological succession, an ecosystem exhibits total photosynthesis equal to respiration ?  
(A) Pioneer (B) Climax (C) Virgin (D) Mid-seral
44. When in a community a species has the same abundance and density, the frequency of the species shall be :  
(A) 20% (B) 50% (C) 90% (D) 100%
45. For determination of primary productivity in a lake, which is the most appropriate time for sampling ?  
(A) 5 AM (B) 8 AM (C) 12 Noon (D) 3 PM
46. Which is the best and simple method to determination of fluorine in ground water ?  
(A) Atomic Absorption spectrometry (B) Spectrophotometry  
(C) Flame photometry (D) Ion-selective electrode

**Read the passage below and answer questions that follow based on your understanding of the passage :**

Forests in India are fast disappearing at a rate of about 0.6% per year equivalent to about 7.3 million ha. This renders all the closed tropical forests disappear within 177 years, At this rate of destruction of tropical forests, about 20-25% of the worlds plant species would have been lost by the year 2000. By another estimate 90% of tropical forest area containing about 505 varieties of world plant species will be destroyed during the next 20 years. By another estimate 1000 species/year would become extinct. This figure is expected to rise to 10,000 species/year. During the next 20 years, about one million species are likely to disappear.

Loss of biodiversity is severe in agricultural ecosystems too. During green revolution, thousands of wild crop varieties were replaced with a few hybrid species. This resulted in slight disappearance of genetic resources of crop plants, especially of wheat and rice. With the disappearance of the plants, the associated microorganisms and fauna were also lost. Further indiscriminate use of fertilizers and insecticides reduced the microbial species diversity live stock populations are already homogenised and their diversity is extinct.

Much of the fragile breeding and feeding grounds of almost 2/3rd of the world's oceanic fish have been destroyed. Endangered marine life in India lists about 8 species of marine mammals, 5 species of marine turtles, 1 species of hemichordate, 3 species of cephalochordate, 10 species of crab etc.

Major cause of loss of biodiversity is the expansion of agricultural practices. Biological diversity is replaced by biological uniformity or monoculture in the name of green revolution in agriculture, white revolution in dairying and blue revolution in fisheries. The purpose of all these revolutions is to ensure food security and prevent "hunger disaster".

Biodiversity is also lost due to reclamation for building dams, factories highways, mining operations etc. in the forested regions. Illegal trade and poaching of wild life also damaged biodiversity. Thus, biodiversity is destroyed by anthropogenic activities.

47. Loss of biodiversity is primarily due to :
- (A) Green revolution (B) White revolution  
(C) Blue revolution (D) Mining Activity
48. Decrease in India's forest cover is attributed mainly to :
- (A) Urbanization and Industrialisation (B) Agriculture and Dairying  
(C) Rail and Road Construction (D) Mining and Power Plants
49. About 90% of tropical forest area containing \_\_\_\_\_ varieties of world's plant species in the next twenty years.
- (A) 7.3 million (B) 505 (C) 10,000 (D) 1000
50. The reduction of microbial species is due to :
- (A) Mining operations (B) Application of chemical fertilizers  
(C) Loss of wildlife (D) Construction of highways.