

UGC NET 2004 DECEMBER PAPER 2 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.

- Identify the correct chronological sequence (oldest to youngest) in the order of their formation :
 - Pacific ocean > Atlantic ocean > Mediterranean sea > Indian ocean
 - Pacific ocean > Atlantic ocean > Indian ocean > Mediterranean sea
 - Atlantic ocean > Pacific ocean > Indian ocean > Mediterranean sea
 - Atlantic ocean > Pacific ocean > Mediterranean sea > Indian ocean
- Movement of individual rock masses along structural planes such as bedding, joints and faults on a slope is known as :
 - debris slide
 - slump
 - rock slide
 - soil creep
- Make list I and list II and select the correct answer using codes given below the lists :

List I

- Mid oceanic ridge
- Rift valley
- Island arc
- Continent

List II

- Alkali rich basalt
- Potash poor basalt
- Andesite
- Plateau basalt

Code :

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

4. Consider the following about the Himalayan orogeny :
- (a) The orogeny resulted from the southward movement
 - (b) The orogeny began about 25 million years ago
 - (c) The orogeny closed about 1 million years ago
 - (d) The Himalayas have a root of relatively light crustal rocks projecting into the denser mantle.

Which of the following combinations is correct ?

- (A) (a) and (b)
- (B) (c) and (d)
- (C) (a) and (c)
- (D) (b) and (d)

5. A seismogram records the following types of earthquake waves.

- (a) L - waves
- (b) P - waves
- (c) S - waves

The correct chronological sequence of the arrival of these waves is :

- (A) (b), (c) and (a)
- (B) (b), (a) and (c)
- (C) (c), (a) and (b)
- (D) (a), (b) and (c) arrive at the same time

6. Which one of the following statement is true of braided streams ?

- (A) Width of the channel is less than its depth
- (B) Width and depth of the channel are equal
- (C) Width of the channel is greater than its depth
- (D) Width of the channel is unrelated to its depth

7. In which of the following frequency ranges the human ear is most sensitive to noise :
- (A) 1 - 2 KHz
 - (B) 100 - 500 Hz
 - (C) 10 - 12 KHz
 - (D) 13 - 16 KHz
8. Which of the following indices represents the background noise level in the ambient environment ?
- (A) L_{dn}
 - (B) L_{10}
 - (C) L_{90}
 - (D) L_{50}
9. Assertion (A) : Aerosols have potential for modifying the climate.
Reason (R) : Aerosols interact with both short wave and infra - red radiations
- (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 and (R) is false
 - (D) (A) is false but (R) is true
10. Which of the following grows rapidly resulting in the shrinkage of water bodies ?
- (A) Phytoplankton
 - (B) Zooplankton
 - (C) Algae
 - (D) Macrophytes

11. Which species of chromium is toxic in water ?
- (A) Cr^{+2}
 - (B) Cr^{+3}
 - (C) Cr^{+6}
 - (D) Cr^0
12. Chemical compounds having same crystal structure are called :
- (A) Polymorphic
 - (B) Pseudomorphic
 - (C) Isomorphic
 - (D) None of the above
13. Micas having an atomic structure defined as continuous sheets of tetrahedrons, sharing 3 - oxygen atoms, are called :
- (A) Inosilicate
 - (B) Phyllosilicate
 - (C) Tectosilicate
 - (D) Sorosilicate
14. Alkalinity in river waters is caused due to :
- (A) Presence of SO_4^{2-}
 - (B) Na^+ and K^+
 - (C) Cl^-
 - (D) CO_3^- and HCO_3^-

15. If the population growth follows a logistic curve, the maximum sustainable yield :
- (A) is equal to half the carrying capacity
 - (B) is equal to the carrying capacity
 - (C) depends on growth rate
 - (D) depends on the initial population
16. Fluidized - bed combustion of coal is an efficient method of controlling which of the following air pollutants :
- (A) CO
 - (B) SPM and NO_x
 - (C) NO_x and SO_x
 - (D) CO, SPM and SO_x
17. The plume rise in a coal based thermal power plant depends on :
- (a) buoyancy
 - (b) atmospheric stability
 - (c) momentum of exhaust gases

Identify the correct combination

- (A) (a) and (b) only
- (B) (b) and (c) only
- (C) (a) and (c) only
- (D) (a), (b) and (c)

18. The efficiency of a solar flat plate collector depends on :

- (a) Thermal efficiency
- (b) Optical efficiency
- (c) Solar flux

Identify the correct combination

- (A) (a), (b) and (c)
- (B) (a) and (b) only
- (C) (b) and (c) only
- (D) (a) and (c) only

19. An increase of 10 ppm in the concentration of CO_2 in atmosphere represents approximately an addition of carbon of amount :

- (A) 1.2 Kilotons
- (B) 2.12 Megatons
- (C) 21.2 Geiga tons
- (D) 2120 tons

20. Winds blowing down an incline often due to cold air drainage is called :

- (A) Anabatic winds
- (B) Mountain winds
- (C) Cyclonic winds
- (D) Katabatic winds

21. Mixing height is :

- (A) the height of ground based inversion
- (B) the height at which geostrophic balance occurs
- (C) the height of constant solar flux layer
- (D) the height upto which atmosphere is churned by convection

22. For a comprehensive EIA study, it is to be conducted for :
- (A) the whole year
 - (B) any three seasons including monsoon
 - (C) three seasons excluding monsoon
 - (D) the worst season
23. Emissions from landfills of solid waste include :
- (A) SO_2 , NO_x , SPM
 - (B) NH_4^+ , CO_2 , CO
 - (C) NH_4^+ , CO_2 , CO, H_2S , CH_4 , H_2 , N_2
 - (D) CO, CO_2 , O_3
24. In initial environmental examination, the following are considered :
- (A) No quantitative data
 - (B) Primary data
 - (C) Secondary data
 - (D) On site data for atleast a season
25. Which of the following forest types is most widespread in India ?
- (A) Tropical evergreen forest
 - (B) Tropical deciduous forest
 - (C) Temperate forest
 - (D) Scrub forest
26. The presence of pneumatophores is seen in :
- (A) Desert plants
 - (B) Climbers and lianas
 - (C) Trees of tropical moist forests
 - (D) Mangroves

27. Ramsar convention is related to conservation of :
- (A) Tiger
 - (B) Elephants
 - (C) Crop genetic diversity
 - (D) Wetlands
28. A significant effect of climate change on account of global warming on terrestrial plants will be on :
- (A) Stomatal mechanism
 - (B) Amino acid composition of cereal grains
 - (C) Phenology
 - (D) Bark formation in trees
29. A tree, which is popular in social forestry programme in India, is :
- (A) Shorea robusta
 - (B) Ailanthus excelsa
 - (C) Cedrus deodara
 - (D) Callistemon lanceolatus
30. The great Indian Rhino has its natural home in :
- (A) Kaziranga National Park
 - (B) Corbett National Park
 - (C) Sunderbans
 - (D) Kanha National Park
31. According to the Botanical Survey of India, the total number of plant species in India is about :
- (A) 45,000
 - (B) 75,000
 - (C) 17,000
 - (D) 30,000

32. Assertion (A) : Bt cotton is a transgenic crop which has been introduced in India, but is being opposed on environmental grounds.
- Reason (R) : Cry1Ac protein in Bt cotton has been found to be toxic and allergenic to human beings.
- (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 correct explanation of (A).
(C) (A) is true but (R) is false
(D) (A) is false but (R) is true
33. Oxygen toxicity (in humans) is caused by :
- (A) Inhalation of molecular oxygen
(B) Generation of free radicals
(C) Interactions of singlet oxygen with membrane
(D) None of the above
34. $C_2F_3Cl_3$ gas :
- (A) absorbs ultraviolet radiations
(B) affects tropospheric ozone
(C) forms aerosols in stratosphere
(D) absorbs infrared radiations
35. Which of the following shows bioaccumulation and contaminate food chains ?
- (A) Pesticides
(B) Polychlorinated biphenyls
(C) PAN
(D) All of the above

36. Removal of which of the following impurities from contaminated water requires the use of coagulants :
- (A) Colloidal impurities
 - (B) dissolved solids
 - (C) micro organisms
 - (D) all of the above

37. Drinking water quality at source after conventional treatment and disinfection should have some of the following characteristics
- (a) Total coliform organisms (MPN/100 ml) 500 or less
 - (b) pH between 5.5 - 6.5
 - (c) dissolved oxygen 10 mg/litre or above
 - (d) B.O.D. at 20°C 3 mg/litre or less

Identify the correct combination

- (A) (a) and (d)
 - (B) (a) and (b)
 - (C) (c) and (d)
 - (D) (a) and (c)
38. The most efficient method of biodegradable urban solid waste management is :
- (A) Landfills
 - (B) Pelletisation
 - (C) Gasification
 - (D) Composting
39. Pollutants in soil can be broken down by micro organisms. The process is called :
- (A) Probiotics
 - (B) Bioremediation
 - (C) Bioaugmentation
 - (D) None of the above

40. A thermodynamic function of state which is constant during a reversible isobaric isothermal process is :
- (A) Geothermal potential
 - (B) Thermodynamic efficiency
 - (C) Enthalpy
 - (D) Gibb's free energy
41. t - statistic is useful for testing :
- (A) Variances
 - (B) Overall goodness of fit of a regression model
 - (C) null hypothesis for a regression coefficient
 - (D) constancy of the mean
42. For a Normal distribution, the skewness is :
- (A) 1
 - (B) 0
 - (C) ∞
 - (D) $\frac{1}{2}$
43. 1 metric ton of average coal in energy terms is equivalent to :
- (A) 2000 cubic feet of natural gas
 - (B) 24000 cubic feet of natural gas
 - (C) 1.5 barrels of oil
 - (D) 2.0 barrels of oil
44. The energy release per deuteron in a Deuterium - Tritium fusion reaction is approximately :
- (A) 1.6 MeV
 - (B) 17.6 KeV
 - (C) 17.6 MeV
 - (D) 17.6 GeV

45. In marine environment Carbonate Compensation Depth (CCD) is defined as depth at which :
- (A) Carbonate begins to dissolve
 - (B) Carbonate begins to precipitate
 - (C) Bicarbonate begins to precipitate
 - (D) Bicarbonate begins to dissolve
46. In an idealised Magnetohydrodynamic power plant, the maximum power output varies with fuel velocity (u) as :
- (A) U
 - (B) U^2
 - (C) U^3
 - (D) $U^{1/2}$
47. The most commonly found ion in rain water in India is :
- (A) SO_4^{2-}
 - (B) Na^+
 - (C) K^+
 - (D) Cl^-
48. In humid climate, weathering of various types of rocks occurs. Identify the correct sequence in order of decreasing weathering :
- (A) Basalt > Dunite > Granite
 - (B) Basalt > Granite > Dunite
 - (C) Dunite > Granite > Basalt
 - (D) Dunite > Basalt > Granite

49. Match list I and list II and select the correct answer using codes given below the lists :

List I

- (a) Ozone depletion
- (b) CO₂ reduction
- (c) Sustainable development
- (d) Hazardous waste

List II

- (i) Basel convention
- (ii) Kyoto Protocol
- (iii) Rio Summit
- (iv) Montreal Protocol

Code :

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

50. The lion - tailed macaque is endemic to :

- (A) Andaman and Nicobar islands
- (B) Lakshadweep
- (C) Nilgiri
- (D) Arunachal Pradesh