UGC NET PAPER 2 JUNE 26, 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. For maximum biogas production following conditions are recommended :

(A) Strict anaerobic (B) Strict aerobic

(C) Only cellulose as a carbon source (D) Semi aerobic

2. To establish wind mill for commercial production of electricity, the optimum range of wind speeds required is :

(A) 4 - 10 m/sec (B) 20 - 30 m/sec

(C) 35 - 45 m/sec (D) > 100 m/sec

3. To initiate fission of ^{238}U, the kinetic energy required for neutron is :

(A) ~ 1.5 MeV (B) ~ 0.5 MeV (C) ~ .025 MeV (D) ~ 1 KeV

4. The national ambient air quality standard for average annual concentration of NO_x in residential area is :

(A) 20 $\mu g/m^3$ (B) 60 $\mu g/m^3$ (C) 80 $\mu g/m^3$ (D) 100 $\mu g/m^3$

5. Land sea and mountain valley breezes occur on which of the following horizontal space scales :

(A) Micro Scale (B) Meso scale

(C) Synoptic scale (D) > 40,000 km

6. Carbon di-oxide absorbs radiation very strongly in which of the following wavelength ranges ?

(A) 12 - 18 μm (B) 4 - 11 μm (C) 0.7 - 3 μm (D) 0.8 - 1.1 μm

7. About 97% of the atmospheric mass lies in the first

(A) 30 km above ground (B) 100 km above ground

(C) 300 km above ground (D) 10 km above ground

8. Which is the correct chronological order (oldest to youngest) in which the following were formed :

(I) Atlantic Ocean (II) Indian Ocean

(III) Pacific Ocean (IV) Mediterranean sea

Select the correct answer using the code given below :

(A) III, I, IV, II (B) III, I, II, IV

(C) I, III, II, IV (D) I, III, IV, II

9. A seismogram records the following types of earthquake waves :
(I) L Waves (II) P Waves (III) S Waves
The correct chronological sequence of the arrival of these waves is :
(A) II, III, I (B) II, I, III
(C) III, II, I (D) III I II

10. In humid climate, the rate of weathering of the following types of rocks is such that :
(A) Basalt > Dunite > Granite (B) Basalt > Granite > Dunite
(C) Dunite > Granite > Basalt (D) Dunite > Basalt > Granite

11. Which one of the following proximate content of coal indicates the optimum by product availability during coal carbonisation :
(A) Moisture (B) Volatile matter
(C) Fixed Carbon (D) Ash

12. Match list I and II and select the correct answer choosing the codes given below the lists :

	List - I		**List - II**
(a)	Chain silicates	(1)	Quartz
(b)	Tekto silicates	(2)	Beryl
(c)	Phyllo silicates	(3)	Augite
(d)	Cyclo silicates	(4)	Muscovite

Codes :

	(a)	**(b)**	**(c)**	**(d)**
(A)	1	2	3	4
(B)	1	2	4	3
(C)	3	1	2	4
(D)	3	1	4	2

13. In a closed ecosystem, across its boundries,
(A) Energy can transfer but mass can not transfer
(B) Mass can transfer but energy can not transfer
(C) Both energy and mass can not transfer
(D) Both energy and mass can transfer

14. Under z transformation $z = (x - \mu) / \sigma$, the normal distribution $f(x)$ with mean μ and standard deviation σ, has the standard deviation :
(A) 0 (B) 1 (C) ∞ (D) $\sqrt{\pi}$

15. The geometric mean of the following numbers 2, 3, 2, 3, 2, 3, 2, 3 is :
(A) $\sqrt{6}$ (B) 6 (C) 2.5 (D) 5.0

16. Which of the following gases has maximum global warming potential (GWP) :
(A) SF_6 (B) CH_4 (C) CO_2 (D) CFC_5

17. In India, Air (Prevention and Control of Pollution) Act came into being in which year ?
(A) 1974 (B) 1981 (C) 1978 (D) 1990

18. Kyoto Protocol envisages a reduction is CO_2 concentration, below 1990 levels, by :
(A) 10.2% (B) 5.2 % (C) 15% (D) 25%

19. Anamalous expansion of water have helped amphibious biological systems to sustain themselves in polar regions such as :
(A) Polar bear (B) Frog (C) Eskimo (D) Seal

20. When 100 ml of 0.1M sulphuric acid is used to neutralise 0.01N NaOH, how many milli-litres of NaOH will be required ?
(A) 100 (B) 500 (C) 1000 (D) 2000

21. If 100% noise dose corresponds to equivalent sound pressure level L_{eq} = 90 dB for 8 hours, then 25% dose would correspond to :
(A) 93 dB for 2 hours (B) 90 dB for 4 hours
(C) 87 dB for 4 hours (D) 87 dB for 2 hours

22. ^{60}Co (Cobalt sixty) is used to treat cancer as it emits :
(A) Strong gamma rays (B) β radiations
(C) α radiations (D) X - rays

23. Molar concentration of pure water is :
(A) 1M (B) 18 M (C) 55.5M (D) 100 M

24. The internal combustion engines using petrol are mainly responsible for the generation of :
(A) Ozone (B) NO_x (C) SO_x (D) VOCs

25. Which nod gene product interacts with flavonoids to initiate the process of root hair deformation ?
(A) Nod A (B) Nod B (C) Nod C (D) Nod D

26. Which of the materials is most preferred as a carrier for legume inoculation ?
(A) Peat (B) Slag (C) Soil (D) Anthracite

27. **Assertion (A) :** The ozone layer absorbs UV radiations.
Reason (R) : Part of the UV flux is used up in the formation of ozone in stratosphere
(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 not the correct explanation of **(A)**
(C) **(A)** is true but **(R)** is false
(D) **(A)** is false but **(R)** is true

28. Match Lists I and II and select the correct answer using the codes given below the lists :

	List - I (Characteristics)		**List - II** (Terms/Names)
(a)	Point of initial movement during the earthquakes	I.	Tsunami
(b)	Measurement of the magnitude of earthquake	II.	Insolation
(c)	Measurement of solar radiation incident on earth	III.	Richter scale
(d)	Earthquakes generated water waves in coastal areas	IV.	Focus

Codes :

	(a)	**(b)**	**(c)**	**(d)**
(A)	IV	III	II	I
(B)	III	IV	I	II
(C)	II	I	III	IV
(D)	I	II	IV	III

29. Which is the most common gas released from the landfills :

(A) Carbon monoxide (B) Methane
(C) Hydrogen Sulphide (D) Carbon di oxide

30. Trickling filters are used for the treatment of :

(A) Primary sewage (B) Secondary sewage
(C) Tertiary sewage (D) Quaternary sewage

31. Continuous - flow air-agitated photobioreactors are used for the removal of which compound from water ?

(A) Nitrite (B) Chloride (C) Cyanide (D) Nitrate

32. Sea water is :

(A) acidic (B) alkaline (C) neutral (D) hypotonic

33. The tidal mouth of a river opening into the sea is termed as :

(A) Estuary (B) Littoral zone
(C) Hypoliminion (D) Abyssal zone

34. In an aquatic ecosystem, the depth to which light penetrates is called :

(A) aphotic (B) photic (C) euphotic (D) nonphotic

35. Which of the following is used for the large scale treatment of potable water ?

(A) Chlorine (B) Potassium permagnate
(C) Ozone (D) Potassium permagnate and UV radiation

36. High B.O.D values in a water sample reflects a :
(A) High biodegradable organic content
(B) Low organic content
(C) High phosphorous content
(D) High nitrogen content

37. Biological rhythm in animals is regulated by one of the following :
(A) Water (B) Air (C) Light (D) Crowding

38. Pineal gland mediates the environmental information to animals through the day-night secretion of :
(A) Gonadotropin (B) Thyroxin
(C) Melanin (D) Melatonin

39. Zeitgeber means :
(A) Time giving (B) Photoperiod information
(C) Temperature information (D) Rainfall information

40. The ΔG_0 of ATP hydrolysis could not be measured directly because :
(A) one cannot determine the K_{eq}
(B) ATPase concentration could not be measured
(C) One of the reactants could not be estimated
(D) The products could not be determined

41. The corals generally grow in nutrient poor clear sea water because :
(A) Nutrients are provided through sewage
(B) Single cell algae present on the corals provide nutrients through photosynthesis
(C) They absorb nutrients from the sea water
(D) They get nutrition from the dead organisms.

42. Thermoclines of a lake mean :
(A) The upper layer with well lit, will mixed and relatively having warm water
(B) The intermediate layer in which a rapid decline in temperature occurs with depth
(C) The deep layer which is generally cold and dark
(D) The bottom layer

43. A cell is filled up with 0.6M NaCl and presumed that the membrane is more permeable to water than NaCl. In this condition if the cell is placed in 0.2 M NaCl, the approach to equilibrium will be largely governed by :
(A) Osmosis
(B) Diffusion
(C) Losing salt rapidly
(D) Losing salt and water equally

44. When a low lander man is transferred to high altitudes, the oxygen consumption will :
(A) not decrease
(B) remain the same
(C) reduce mytochondrial oxygen tension
(D) Impair oxidative metabolism

45. **Assertion (A) :** Cost-Benefit Analysis is an important tool in Environmental Impact Assessment.
Reasons (R) : It evaluates the likely return on capital inputs in a project.
(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 but **(R)** is false
(D) **(A)** is false but **(R)** is true

46. Environmental Impact Assessment (EIA) seeks to achieve goals pertaining to :
(A) Sustainable Development
(B) Prevention of pollution only
(C) Conservation of resources only
(D) Social Benefit

47. **Assertion (A) :** Environmental Audit is an important aspect of post-project analysis
Reasons (R) : It helps in assessment of compliance with environmental regulatory requirements.
(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 but R is false
(D) **(A)** is false but R is true

48. For the detection of Polyaromatic hydrocarbons (PAH) which of the following instruments is used ?
(A) Atomic Absorption Spectrophotometer
(B) X-ray Diffractometer
(C) Gas Chromatograph
(D) Flame Photometer

49. **Assertion (A) :** Land use changes have implications for Climate.
Reasons (R) : The radiative fluxes get modified
(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 but **(R)** is false
(D) **(A)** is false but **(R)** is true

50. Tissue protein can be estimated by :
(A) Gravimetric method
(B) Biurate method
(C) Caloriemeter
(D) Manometer