2013 June UGC NET Solved Question Paper in Environmental Sciences, Paper III

1. Most of the day to day weather changes are associated with which scale in meteorology?

(A) Micro scale

(B) Meso scale

(C) Synoptic scale

(D) Planetary scale

Answer: (C)

2. Match the List-I with List-II and choose the correct answer from the codes given below:

List – I (Date)	List – II (Event)
(a) 5th June	(i) National Pollution Prevention Day
(b) 2nd December	(ii) World Environment Day
(c) 22nd May	(iii) World Forest Day
(d) 21st March	(iv) Bio-diversity Day

Codes:

(a) (b) (c) (d)

(A) (ii) (i) (iv) (iii)

(B) (iii) (ii) (iv) (i)

(C) (iv) (iii) (ii) (i)

(D) (i) (iv) (iii) (ii)

Answer: (A)

3. ‘Fanning’ smokestack plumes are observed when

(A) There is an inversion above the ground surface.

(B) There is unstable atmosphere.

(C) There is neutrally stable atmosphere.

(D) The stack height is below an inversion layer.

Answer: (A)

4. The cyclonic winds are generated by the approximate balance between

(A) Pressure gradient force and coriolis force

(B) Centrifugal force and coriolis force

(C) Centrifugal force, coriolis force and frictional drag force.

(D) Centrifugal force and pressure gradient force.

Answer: (D)

5. Mixing height is determined by

(A) Adiabatic lapse rate and environmental lapse rate.

(B) Vertical profile of wind speeds and adiabatic lapse rate.

(C) Vertical profiles of wind speedsand ambient temperature.

(D) Wind speeds and solar insolation.

Answer: (A)

6. United Nations has declared “UN Decade of Education for sustainable Development” and the decade identified for this education is

(A) 2006 – 2015

(B) 2005 – 2014

(C) 2011 – 2020

(D) 2012 – 2021

Answer: (B)

7. Halon – 1301 is a

(A) Fire extinguisher

(B) Solvent

(C) Refrigerant

(D) Aerosol propellant

Answer: (A)

8. Which of the following is a primary pollutant in atmospheric air?

(A) Cl_2

(B) SO_3

(C) Nitrates

(D) Sulphates

Answer: (A)

9. Hardness is expressed on the Mohs scale, which ranges from

(A) 1 to 10

(B) 1 to 14

(C) –14 to 14

(D) 1 to 100

Answer: (A)

10. The halon H-1211 has the following chemical composition:

(A) CF_2 C*l* Br

(B) CCl_2 FBr

(C) CCl_2 F_2

(D) CBr_2 C*l* F

Answer: (A)

11. The most toxic among the chlorinated hydrocarbons is

(A) Aldrin

(B) DDT

(C) Endrin

(D) Heptachlor

Answer: (C)

12. Agent orange is a

(A) Weedicide

(B) Fungicide

(C) Nematicide

(D) Rodenticide

Answer: (A)

13. Major source of SO_2 is

(A) Cement Industry

(B) Forest fires

(C) Thermal Power Stations

(D) Volcanic activity

Answer: (D)

14. Match each water contaminant in Column-I with its preferred method of removal in Column-II.

Column – I	Column – II
(a) Mn^{2+}	(i) Activated Carbon
(b) Ca^{2+} and HCO_3 –	(ii) Raise Ph. by addition of Na_2CO_3
(c) Trihalomethane	(iii) Addition of lime
(d) Mg^{2+}	(iv) Oxidation

Codes:

(a) (b) (c) (d)

(A) (iv) (iii) (i) (ii)

(B) (iii) (ii) (iv) (i)

(C) (ii) (iv) (iii) (i)

(D) (i) (ii) (iv) (iii)

Answer: (A)

15. Reverse Osmosis (RO) operated at 200–1200 psig removes particles ranging from

(A) 0.0001 to 0.001 μm

(B) 0.01 to 10 μm

(C) 0.1 to 1.0 μm

(D) 0.1 to 2.0 μm

Answer: (A)

16. Coagulation is a chemical process, in which charged particles or colloids undergo

(A) Stabilization

(B) Destabilization

(C) Attraction

(D) Precipitation

Answer: (B)

17. Water has the following chemical composition:

$[Ca_{2+}]$ = 15 mg/L;

$[Mg^{2+}]$ = 10 mg/L;

$[SO_4{}^{2-}]$ = 30 mg/L;

The total hardness of water will be

(A) 80 mg/L as $CaCO_3$

(B) 55 mg/L as $CaCO_3$

(C) 160 mg/L as $CaCO_3$

(D) 40 mg/L as $CaCO_3$

Answer: (A)

18. Two water samples were collected. Sample # 1: pH = 9, but no carbonate or other dissolved proton donors or acceptors.

Sample # 2: pH = 8.3, but it contains dissolved $NaHCO_3$ at a concentration of 0.01/mg/*l*

Which of the following is true based on the above observations.

(A) Sample # 1 will have more alkalinity.

(B) Sample # 2 will have more alkalinity.

(C) Sample # 1 and sample # 2 will have exactly same alkalinity.

(D) Alkalinity cannot be estimated.

Answer: (B)

19. Two soil samples, A and B, at different soil moisture levels are placed in contact with each other. Water will more likely move from soil A to soil B if their water potential, expressed in kPa, is:

(A) A = –5; B = +5

(B) A = –5; B = –5

(C) A = –20; B = –10

(D) A = –30; B = – 40

Answer: (D)

20. Blue baby syndrome is caused by

(A) Carbon monoxide

(B) Nitrate

(C) Fluoride

(D) Mercury

Answer: (B)

21. Assertion (A): For solar cell fabrication, those semiconducting materials which have band-gap energies in the range 1-1.8 eV are most suitable.

Reason (R): The maximum solar irradiance is around a wavelength corresponding to 1.5 eV.

Identify the correct Code:

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

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

Answer: (A)

22. Assertion (A): State factors (external factors) control the overall structure of an ecosystem and the way things work within it.

Reason (R): The state factors are not themselves influenced by the ecosystem.

Identify the correct code:

(A) (A) is correct (R) is incorrect.

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

(C) Both (A) and (R) are correct and (R) is correct explanation of (A).

(D) Both (A) and (R) are incorrect.

Answer: (B)

23. Assertion (A): When energy is transferred between trophic levels, the successive level in the pathway has lesser available energy compared to the preceding level.

Reason (R): Whenever energy is transformed, there is loss of energy through the release of heat.

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

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

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

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

Answer: (B)

24. Assertion (A): The ecosystem surrounding a river gets damaged due to construction of a dam.

Reason (R): The area gets inundated with large volume of water.

Identify the correct answer:

(A) Both (A) and (R) are true, with (R) being the correct explanation.

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

(C) (A) is true, but (R) is wrong.

(D) Both (A) and (R) are wrong.

Answer: (B)

25. Assertion (A): Soils rich in clay minerals have high levels of organic matter.

Reason (R): Clay soils tend to have low decomposition rates.

Identify the correct answer:

(A) Both statements are correct and (R) is correct explanation of (A).

(B) Both statements are correct, but (R) is not correct explanation of (A).

(C) Statement (A) is correct, but (R) is incorrect.

(D) Statement (A) is incorrect, but (R) is correct.

Answer: (A)

26. Assertion (A): Nitrogen cycle is an endogenic biogeochemical cycle.

Reason (R): Atmospheric N2 can be fixed by certain prokaryotes in the soil.

Choose correct answer:

(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.

Answer: (D)

27. Match the following:

Column – I	Column – II
(a) Nekton	(i) Associated with surface film water
(b) Neuston	(ii) Found at the bottom of an aquatic ecosystem.
(c) Benthos	(iii) Active swimmer, against water current.
(d) Plankton	(iv) Incapable of independent movement.

Choose the correct answer from the Codes:

Codes:

(a) (b) (c) (d)

(A) (i) (iii) (iv) (ii)

(B) (ii) (iv) (i) (iii)

(C) (iii) (i) (ii) (iv)

(D) (iv) (ii) (iii) (i)

Answer: (C)

28. Which of the following is not a major biome of India?

(A) Tropical rain forest biomes

(B) Tropical deciduous forest biomes

(C) Temperate needle leaf forestbiomes

(D) Mountains and glaciers

Answer: (D)

29. To survive and avoid competition for the same resources, a species usually occupies only part of its fundamental niche in a particular community orecosystem. This is called

(A) Geographic isolation

(B) Mutualism

(C) Realized Niche

(D) Broad Niche

Answer: (C)

30. Which of the following is not a characteristic feature of community?

(A) Populations of different species occupying a particular place.

(B) Complex interacting network of plants, animals and microbes.

(C) Different species interacting with one another and with their environment of matter and energy.

(D) Groups of interacting individuals of different species.

Answer: (C)

31. Which of the following food chain is correct?

(A) Krill → Adelie Penguins → Emperor Penguins → Leopard Seal

(B) Krill → Crab eater Seal → Leopard Seal → Killer Whale

(C) Krill → Leopard Seal → Emperor Penguins → Killer Whale

(D) Krill → Crab eater Seal → Killer Whale → Leopard Seal

Answer: (B)

32. The observation that individuals of a population are uniformly distributed suggests that

(A) Density of population is low.

(B) Resources are distributed unevenly.

(C) The members of the population are neither attracted to nor repelled by one another.

(D) The members of the population are competing for access to a resource.

Answer: (D)

33. Which of the following biomes is correctly paired with the description of its climate?

(A) Tropical forests – nearly constant day length and temperature

(B) Tundra – long summers, mild winters

(C) Savannah – cool temperature year-round, uniform precipitation during the year

(D) Temperate grasslands – relatively short growing season, mild winters.

Answer: (A)

34. Cellulose and hemicellulose are not resistant to decay but are broken down more slowly. They are considered

(A) Labile

(B) Moderately labile

(C) Recalcitrant

(D) Nonlabile

Answer: (B)

35. The parasitic gall formation is related to

(A) Host-specific antibodies

(B) Parasite specific cysts

(C) Parasite specific enzymes

(D) Host specific hormones

Answer: (C)

36. What is the estimate of volume of water yield for saturated pond aquifer of 1 metre width and 2 metre depth and length of 4 metre? Consider the porosity of sand to be 35% and specific yield to be 25%?

(A) 2.8 m^3

(B) 28 m^3

(C) 0.28 m^3

(D) 280 m^3

Answer: (A)

37. Arrange the following climate proxies in ascending order of time scales:

(i) Lithological records

(ii) Pollens

(iii) Tree rings

(iv) Historical records

(A) (iv), (iii), (i), (ii)

(B) (iv), (iii), (ii), (i)

(C) (iv), (ii), (i), (iii)

(D) (iv), (i), (iii), (ii)

Answer: (B)

38. Acid drainage is more in mining of

(A) Granite

(B) Bauxite

(C) Lime stone

(D) Base metal sulphide

Answer: (C)

39. Geothermal gradient in Earth is

(A) Uniform throughout.

(B) Higher in continental lithosphere.

(C) Higher in subduction zones.

(D) Lower at mid oceanic ridges.

Answer: (B)

40. Coal mining areas are affected by

(i) Land subsidence

(ii) Fire hazard

(iii) Radioactive waste

(iv) Air pollution

(A) (i) and (ii)

(B) (i), (ii) and (iii)

(C) (i), (ii) and (iv)

(D) (i), (ii), (iii) and (iv)

Answer: (C)

41. Radioactive elements are concentrated in

(A) Earth's core

(B) Earth's mantle

(C) Mid-Oceanic ridges

(D) Earth's crust

Answer: (D)

42. What led to maximum number of fatalities during Indonesian 2004 Earthquake?

(A) Death on account of openings on surface

(B) Fires generated due to earthquake

(C) Epidemic diseases

(D) Tsunami

Answer: (D)

43. Maximum carbon in the world is found in

(A) Oceans

(B) Coal mines

(C) Antarctica

(D) Forests

Answer: (A)

44. The highest seismic domain in India is

(A) The Himalayas

(B) The Western Ghats

(C) The Indogenetic plains

(D) The Dhār war craton

Answer: (A)

45. Earth's core is mainly composed of

(A) Iron

(B) Nitrogen

(C) Carbon

(D) Magnesium

Answer: (A)

46. Gasification is

(A) The high temperature (~ 750 – c850 °C) conversion of solid, carbonaceous fuel into flammable gas mixtures.

(B) The high temperature (~ 750 – 850 °C) conversion of solid, carbonaceous fuel into liquid.

(C) The low temperature (~ 250 – 350 °C) conversion of solid, carbonaceous fuel into flammable gas mixture.

(D) The low temperature (~ 250 – 350 °C) conversion of solid, carbonaceous fuel into liquid.

Answer: (A)

47. In case of magneto hydrodynamic power generation, for maximum power output, the efficiency is

(A) 0.25

(B) 0.5

(C) 0.75

(D) 0.4

Answer: (B)

48. Which combination of radioactive fluxes plays the all important role in climate change?

(A) Visible and infrared

(B) Visible and UV

(C) Visible, UV and infrared

(D) UV, microwaves and infrared

Answer: (A)

49. The climate sensitivity parameter is defined as the rate of change of

(A) Surface temperature with albedo of earth

(B) Surface temperature with CO_2 concentration in atmosphere

(C) Precipitation with earth's temperature

(D) Surface temperature with radioactive forcing.

Answer: (D)

50. Which of the following fuels has highest carbon intensity?

(A) Natural gas

(B) Oil

(C) Bituminous coal

(D) Biomass

Answer: (C)

51. Solid waste treatment by pyrolysis involves

(A) Autoclaving

(B) Heating in presence of air

(C) Heating in presence of acetic acid

(D) Heating in absence of air

Answer: (D)

52. In which year Wildlife Protection Act was enacted?

(A) 1962

(B) 1972

(C) 1982

(D) 1992

Answer: (B)

53. According to National Ambient Air Quality Standards, the annual average concentration of Sulphur dioxide in residential areas in India is

(A) 20 $\mu g/m^3$

(B) 40 $\mu g/m^3$

(C) 60 $\mu g/m^3$

(D) 80 $\mu g/m^3$

Answer: (C)

54. Which of the following statements is correct in the context of Environmental Impact Assessment?

(A) The process considers broad range of potential alternatives.

(B) It provides early warning of cumulative effects.

(C) Focuses on sustainability agenda.

(D) Focuses on standard agenda.

Answer: (D)

55. Match the List-I with List-II and choose the correct answer from the codes given below:

List – I (Components)	List – II (Dimensions)
(a) Equitable utilization of natural resources	(i) Social dimensions
(b) Benefit to disadvantaged group	(ii) Economic dimensions
(c) Creation of additional value	(iii) Environmental dimensions
(d) Elimination of toxic substances	(iv) Political dimensions

Codes:

(a) (b) (c) (d)

(A) (iv) (i) (ii) (iii)

(B) (iv) (i) (iii) (ii)

(C) (iii) (ii) (i) (iv)

(D) (ii) (iv) (i) (iii)

Answer: (A)

56. Among the following, which one does not belong to EIA process?

(A) Establishment of base line environmental condition.

(B) Identification, Prediction and assessment of impact.

(C) Suggesting the mitigation measures.

(D) Developing EMS auditing procedures.

Answer: (D)

57. According to Gaussian Plume Model, the ground level concentration (C) of a pollutant varies with effective height (H) as (σ is the vertical dispersion coefficient):

(A) $C \propto 1/H$

(B) $C \propto e^{-} H^2 /\sigma^2$

(C) $C \propto e^{-} H/\sigma$

(D) $C \propto H^{-2}$

Answer: (B)

58. In a multiple regression analysis, an examination of variances revealed that explained sum of squares per degree of freedom and residual sum of squares per degree of freedom were 250 and 100, respectively. What is the F-ratio?

(A) 6.25

(B) 5.25

(C) 0.4

(D) 2.5

Answer: (D)

Answer: (A)

Answer: (D)

61. A sample of 17 measurements of the diameter of a spherical particle gave a mean = 5 μm and a standard deviation = 0.5 μm. Assuming t-statistic for 16 degrees of freedom $t_{0.05} \approx 2$, the 95% confidence limits of actual diameter are

(A) 4.75 and 5.25 μm.

(B) 4.00 and 6.00 μm.

(C) 4.9 and 5.1 μm.

(D) 4.5 and 5.5 μm.

Answer: (A)

62. “Hot spots” are areas,

(i) Extremely rich in species

(ii) With high endemism

(iii) Extremely scarce in species

(iv) Under constant threat

Choose the correct answer from the codes:

Codes:

(A) (i) and (ii)

(B) (ii) and (iii)

(C) (ii), (iii) and (iv)

(D) (i), (ii) and (iv)

Answer: (D)

63. A paddy field is an example of

(A) Fresh water ecosystem

(B) Terrestrial ecosystem

(C) Auto ecosystem

(D) Engineered ecosystem

Answer: (D)

64. Which pyramid cannot be inverted in a stable ecosystem?

(A) Pyramid of energy

(B) Pyramid of biomass

(C) Pyramid of number

(D) Pyramid of dry weight

Answer: (A)

65. Which one of the following environmental factors is responsible for cyclomorphism in animals?

(A) Moisture

(B) Temperature

(C) Photoperiod

(D) Wind

Answer: (B)

66. Sr^{90} can enter and accumulate in the body through

(A) Drinking water

(B) Inhaling contaminated air

(C) Food chain

(D) Skin

Answer: (C)

67. Which one of the following is a neurotoxic?

(A) Organophosphate

(B) Nitric oxide

(C) 2, 4-D

(D) Cuprous oxide

Answer: (A)

68. If 0.05 M proline-ninhydine complex has an absorbance of 0.15 at 520 nm in a 1 cm curvette, its molar extinction coefficient will be

(A) 50 m M^{-1} cm^{-1}

(B) 0.1 M^{-1} cm^{-1}

(C) 1 M^{-1} cm^{-1}

(D) 3 M^{-1} cm^{-1}

Answer: (D)

69. Which bacterium found in soil is anaerobic?

(A) Clostridium Sp

(B) Azatobacter Sp

(C) Bacillus Sp

(D) Thiobacillus Sp

Answer: (A)

70. Particles of sizes < 1 μm are most efficiently removed by

(A) Cyclones

(B) Scrubbers

(C) Bag filter

(D) Electrostatic Precipitator

Answer: (D)

71. The attenuation of sound by reactive type silencers is based on

(A) Absorption of sound waves

(B) Scattering of sound waves

(C) Impedance discontinuity

(D) Interference of sound waves

Answer: (C)

72. “Farmer’s lung” is a classic example for

(A) Psittacosis

(B) Extrinsic allergic alveolitis

(C) Legionnaire’s disease

(D) Aspergillosis

Answer: (B)

73. The lichen and moss stages occur in

(A) Lithosere

(B) Psamosere

(C) Hydrosere

(D) Hydrarch

Answer: (A)

74. The mean of a data following Poisson distribution is 4.The second moment of the distribution is:

(A) 4

(B) 2

(C) 1

(D) 0

Answer: (A)

75. Which of the following rivers has maximum melt water component in its discharge?

(A) Indus

(B) Ganges

(C) Brahmaputra

(D) Narmada

Answer: (A)