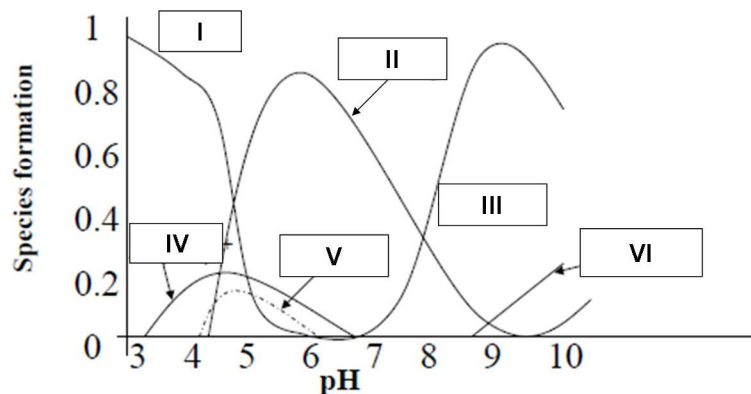


1. Methemoglobinemia is caused by consuming water contaminated with
  - a)  $\text{NO}_2$
  - b)  $\text{NO}_3^-$
  - c)  $\text{NH}_4^+$
  - d)  $\text{NH}_2\text{Cl}$
2. Which species of Chromium is toxic to human beings?
  - a)  $\text{Cr}(\text{OH})_3$
  - b)  $\text{Cr}(\text{H}_2\text{O})_6^{3+}$
  - c)  $\text{CrO}_4^{2-}$
  - d)  $\text{CrO}_2$
3. Air Pollution Tolerance Index (APTI) of vegetation is calculated using :
  - a) Pb content,  $\text{SO}_2$  content and  $\text{NO}_x$  content in air
  - b) Ascorbic acid, total chlorophyll, pH and relative water content of vegetation
  - c) SPM, pH of water and soil types of the area
  - d) Landscape of the area ;  $\text{SO}_2$  and  $\text{NO}_x$  levels in air
4. Coal mine workers are prone to which one of the following diseases :
  - a) Pneumoconiosis
  - b) Byssinosis
  - c) Asbestosis
  - d) Silicosis
5. The disease caused by poisoning due to methyl mercury is known as
  - a) Saturnism
  - b) Minamata disease
  - c) Itai itai disease
  - d) Blue Baby Syndrome
6. For the vehicles using petrol one must carry valid PUC. To get such certificate one must have following parameters, in exhaust, below limits as prescribed by the authorities :
  - a)  $\text{O}_2$  and SPM
  - b)  $\text{CO}$ ,  $\text{HC}$
  - c)  $\text{CO}$  and  $\text{CO}_2$
  - d)  $\text{CO}$ ,  $\text{CO}_2$  and the temperature
7. Which of the following indices represents the background noise level in the ambient environment?
  - a)  $L_{eq}$
  - b)  $L_{10}$
  - c)  $L_{90}$
  - d)  $L_{50}$
8. Bright, confusing, and excessive groupings of light sources are referred to as \_\_\_\_\_
  - a) Glare
  - b) Sky Glow
  - c) Light Trespass
  - d) Clutter
9. The compounds responsible for the proliferation of algal blooms in water bodies are \_\_\_\_\_
  - a) Nitrates and chlorides
  - b) Nitrates and phosphates
  - c) Phosphates and silicates
  - d) Nitrates and carbonates
10. Brewery and sugar factory waste alter the quality of a water body by increasing
  - a) Temperature and BOD
  - b) turbidity and pH
  - c) pH and temperature
  - d) COD and BOD
11. When an air parcel has a tendency to move upward in the atmosphere, we expect the temperature inside the parcel to be \_\_\_\_\_ the atmospheric temperature outside.
  - a) Greater than
  - b) Less than
  - c) Equal to
  - d) Independent of
12. If the environmental lapse rate is much higher than adiabatic lapse rate, \_\_\_\_\_ type of plume behavior is observed
  - a) Looping
  - b) Trapping
  - c) Lofting
  - d) Fumigating

13. \_\_\_\_\_ scattering takes place when the effective diameter of the particle is approximately equal to the size of the wavelength of incident energy.
- a) Rayleigh                      b) Mie                              c) Compton                      d) Brillouin
14. The spectral region of the electromagnetic radiation which passes through the atmosphere without much attenuation is known as:
- a) Spectral window                      c) Absorption window  
b) Atmospheric window                      d) Reflectance window
15. Which of the following Electromagnetic wave is not used in case of remote sensing?
- a) Gamma ray                      c) Visible ray  
b) Microwave                      d) Radio wave
16. IFOV will be more for \_\_\_\_\_ based platforms.
- a) Ground                      c) Aircraft  
b) Balloon                      d) Satellite
17. The ability of the sensor to distinguish between two objects on the Earth's surface is called \_\_\_\_\_ resolution.
- a) Spectral                      c) Radiometric  
b) Spatial                      d) Temporal
18. The purpose of georeferencing is to:
- a) Convert data to a feature class  
b) Project the data so that it has no distortion  
c) Assign geographic location information  
d) Combine two data sets
19. Global Positioning Service (GPS) is based on a principle called:
- a) Transmission                      c) Obliteration  
b) Trilateration                      d) Globalization
20. Line joining points of equal elevation in a map is called \_\_\_\_\_
- a) Isoline                      c) Isochore  
b) Contour                      d) Collar
21. Which one is appropriate definition of scale of a map?
- a) The lines on a map representing north-south  
b) A conversion factor used to transform map projections  
c) The ratio of a distance on a map to the corresponding distance on the ground  
d) The lines on a map representing east-west directions
22. Which of the following pixel size will have more spatial resolution?
- a) 30 m × 30 m                      c) 1 m × 1 m  
b) 3 m × 3 m                      d) 10 m × 10 m

23. Which of the following objects will have minimum drag coefficient during sedimentation process?
- Sphere
  - Half sphere
  - Streamline body
  - Cube
24. Coagulant can be used to reduce \_\_\_\_\_ between colloidal particles to facilitate aggregation of particles.
- Electrostatic repulsion
  - Electrostatic attraction
  - Intermolecular or Van der Waals force of attraction
  - Gravitational force of attraction
25. Which is the correct flowchart of conventional water treatment plant?
- Coagulation & flocculation → Sedimentation → Filtration → Disinfection
  - Sedimentation → Disinfection → Coagulation & flocculation → Filtration
  - Disinfection → Coagulation & flocculation → Sedimentation → Filtration
  - Disinfection → Coagulation & flocculation → Filtration → sedimentation
26. Measuring zeta potential is useful in determining which property of a liquid formulation?
- Viscosity
  - Stability
  - Particle size
  - Drag coefficient
27. Which of the following is the correct representation of species of alum hydrolysis in coagulation and flocculation?



- I –  $\text{Al}^{3+}$ , II –  $\text{Al}(\text{OH})_2^{2+}$ , III –  $\text{Al}(\text{OH})_2^{2+}$ , IV –  $\text{Al}(\text{OH})_3$ , V –  $\text{Al}(\text{OH})_4^-$  and VI –  $\text{Al}(\text{OH})_5^{2-}$
  - VI –  $\text{Al}^{3+}$ , V –  $\text{Al}(\text{OH})_2^{2+}$ , IV –  $\text{Al}(\text{OH})_2^{2+}$ , III –  $\text{Al}(\text{OH})_3$ , II –  $\text{Al}(\text{OH})_4^-$  and I –  $\text{Al}(\text{OH})_5^{2-}$
  - I –  $\text{Al}^{3+}$ , II –  $\text{Al}(\text{OH})_3$ , III –  $\text{Al}(\text{OH})_4^-$ , IV –  $\text{Al}(\text{OH})_2^{2+}$ , V –  $\text{Al}(\text{OH})_2^{2+}$  and VI –  $\text{Al}(\text{OH})_5^{2-}$
  - I –  $\text{Al}(\text{OH})_3$ , II –  $\text{Al}(\text{OH})_2^{2+}$ , III –  $\text{Al}(\text{OH})_2^{2+}$ , IV –  $\text{Al}^{3+}$ , V –  $\text{Al}(\text{OH})_4^-$  and VI –  $\text{Al}(\text{OH})_5^{2-}$
28. An object floats in wastewater while the same object sinks in drinking water because:
- Wastewater has a lesser density than object
  - Wastewater has a greater density than drinking water
  - Wastewater exerts less buoyant force on the object than drinking water
  - Wastewater repels the object

29. Which of the following is not a limitation of natural coagulant such as crude extract of seeds of *Moringa oleifera* (drumstick)?
- It increases colloidal particles
  - It increases organic matter and chlorine demand
  - It causes colour, taste & odour problems by long period of water storage
  - Unable to coagulate orthophosphate & nitrates
30. Which of the following species is more potent in disinfection process?
- $HOCl$
  - $OCl^-$
  - $Cl_2$  (g)
  - $Cl_2$  (aq)
31. The enmeshment of colloidal particles in a precipitate of hydrolyzed chemical coagulant is known as:
- Sweep floc
  - Perikinetic floc
  - Orthokinetic floc
  - Sedimentation
32. \_\_\_\_\_ is adequate method to select optimum doses of coagulant for water treatment.
- Column test
  - Hydraulic flocculator test
  - Gravimetric test
  - Jar test
33. Which of the following component is not generally used in GC?
- Pump
  - Thermostatic oven
  - Flame Ionization Detector
  - Pressure gauge
34. What is the unit of molar absorptivity or absorptivity (molar absorptivity coefficient) which is used to determine concentration in Beer Lambert's formula?
- $L\ mol^{-1}\ cm^{-1}$
  - $L\ gm^{-1}\ cm^{-1}$
  - cm
  - No unit
35. In reversed-phase HPLC:
- a hydrophilic stationary phase is combined with a polar mobile phase
  - a hydrophobic stationary phase is combined with a polar mobile phase
  - a hydrophilic stationary phase is combined with a non-polar mobile phase
  - a hydrophobic stationary phase is combined with a non-polar mobile phase
36. The movement of DNA in an electric field depends on
- The magnitude of charge and mass of DNA molecules
  - The magnitude of charge and shape of DNA molecules
  - Shape and size of DNA molecules
  - The magnitude of charge, shape, and mass of DNA molecules
37. Standard curves are prepared to calculate the concentration of the analyzed substrate with the help of a spectrophotometer by plotting concentration vs:
- wavelength
  - Absorbance
  - Emittance
  - Transmittance

38. What would be the pH of a solution with a hydroxide ion concentration of  $10^{-6}$  M?  
 a) pH 10                      b) pH 6                      c) pH 8                      d) pH 2
39. The Chloride content in water can be determined by  
 a) Complexometric titration                      c) Redox titration  
 b) Precipitation titration                      d) Acid-Base titration
40. Which of the following soils is also known as “regur” and globally as “tropical chernozems”?  
 a) Arid soil                      b) Laterite soil                      c) Black soil                      d) Red soil
41. Water well excavated through confined aquifers are known as  
 a) Artesian well                      c) Gravity wells  
 b) Non artesian well                      d) Water table wells
42. What type of chemical weathering is enhanced by acid rain?  
 a) Hydrolysis and carbonation                      c) Carbonation and oxidation  
 b) Oxidation and hydrolysis                      d) Carbonation, hydrolysis and oxidation
43. Which layer of the ocean allows for photosynthesis to occur because of sunlight penetration?  
 a) Euphotic zone                      c) Bathyal zone  
 b) Hadal zone                      d) Abyssal zone
44. The common features among  $\text{NO}_2$ ,  $\text{SO}_2$ ,  $\text{CO}_2$  and SPM is that, that all of them \_\_\_\_\_  
 a) are classified as primary pollutants.                      c) have an equal role in causing acid rain.  
 b) are classified as priority pollutants.                      d) are responsible for photochemical smog
45. Peroxyacetyl nitrate (PAN) is a \_\_\_\_\_ pollutant.  
 a) Primary                      c) Tertiary  
 b) Secondary                      d) Fourth order
46. As a river overflows its banks during flood, it drops much of its coarser-grained load immediately, forming landforms called \_\_\_\_\_.  
 a) Deltas                      c) Natural levees  
 b) Alluvial fans                      d) Point bars
47. Which of the following limits primary production in fresh water lakes?  
 a) Phosphorous                      c) Oxygen  
 b) Carbon                      d) Calcium
48. Petroleum, coal, limestone are related to which cycle,  
 a) Nitrogen                      c) Hydrogen  
 b) Oxygen                      d) Carbon
49. Which of the following is NOT an example of in-situ conservation strategy?  
 a) Sacred groves                      c) National Park  
 b) Botanical garden                      d) Sanctuary

50. The World Biodiversity Day is observed every year on \_\_\_\_\_.
- a) March 21                      b) May 22                      c) June 23                      d) April 22
51. Which of the following forest has highest bio-diversity?
- a) Tundra                      b) Taiga                      c) Temperate                      d) Tropical
52. Which of the following term can be used to express the transition zone between desert and forest?
- a) Ecosystem                      b) Thermocline                      c) Biome                      d) Ecotone
53. The working efficiency of ecosystem is affected when decomposers are removed from it, because
- a) Flow of nutrient will stop  
b) Flow of energy will stop  
c) Other components will start decomposition faster  
d) Flow of water will stop
54. The key characteristic of K-selected species is,
- a) A short life span                      c) A high intrinsic rate of growth  
b) Low reproductive rate                      d) Small body size and copious progeny
55. The main criteria used to identify hot spots are:
- a) Endemism                      c) Species diversity  
b) Flowering plant species                      d) Area covered by species
56. Foreign substances which are chemical in nature found within an organism which are not produced naturally are called \_\_\_\_\_
- a) Xenobiotics                      c) Refractobiotics  
b) Xerobiotics                      d) Bio-stimulants
57. The process of conversion of productive land to arid or semi-arid lands is known as \_\_\_\_\_.
- a) Deforestation                      c) Defragmentation  
b) Denaturation                      d) Desertification
58. Onsite mulching and composting of waste is a component of integrated solid waste management under the process of:
- a) Recycling                      c) Source Reduction  
b) Disposal                      d) Disinfection
59. Choose the correct sequence in resource recovery for mixed solid waste:
- a) Screening → Shredder → Magnetic separation → Air classifier  
b) Air classifier → Screening → Shredder → Magnetic separation  
c) Magnetic separation → Shredder → Screening → Air classifier  
d) Shredder → Screening → Air classifier → Magnetic separation
60. Industries with Pollution Index score including and upto 20 fall under which coloration category?
- a) Red                      b) Yellow                      c) White                      d) Green



70. What issue does COP28 address regarding climate change impacts on communities?
- Loss of social values
  - Loss of employment opportunities
  - Loss and damage caused by climate change to communities
  - Loss of technological advancements
71. The technology which meets the sustainable development needs is termed as
- Clean technology
  - Appropriate technology
  - Sustainable technology
  - Efficient technology
72. Agreement made to compensate the poor countries on loss and damage due to climate change made by rich countries was an outcome of:
- COP 26
  - COP 27
  - COP 28
  - COP 29
73. In collaboration with the European Union (EU), the United Nations Development Programme (UNDP) has allocated grants exceeding US\$420,000 for initiatives related to deforestation, food security, and climate change in which country?
- Indonesia
  - Fiji
  - Papua New Guinea
  - Solomon Islands
74. The “5 Ps” of the UN Sustainable Development Goals are
- People, Planet, Prosperity, Peace, and Partnership
  - People, Profit, Prosperity, Peace and Partnership
  - People, Pollution, Peace, Planet and Partnership
  - People, Plastic, Prosperity, Peace and Partnership
75. Production of chemicals which have deleterious effects on other organisms in a type of community interaction is often referred to as \_\_\_\_\_.
- Chemo – competition
  - Chemo – inhibition
  - Allelopathy
  - Chemopathy
76. Specific mortality of members of a population is expressed by
- Life table
  - Cumulative population growth curve
  - Infant mortality rate
  - Average fecundity
77. Protecting nature and the wilderness for its own sake is referred as
- Deep ecology
  - Holistic ecology
  - Anthropocentric ecology
  - Moral ecology
78. Energy intensity is a measure of
- Energy used to produce a particular output level
  - energy used per unit area
  - energy used per unit volume
  - energy produced per unit area per unit time



79. Maximum energy content (KJ/kg) in a typical municipal solid waste is found in  
 a) Plastic                                      b) Leather                                      c) Wood                                      d) Textile
80. Which of the following conditions is characterised by the second stage of Demographic Transition?  
 a) Low birth rate, High death rate  
 b) High birth rate, High death rate  
 c) High birth rate, declining death rate  
 d) Low birth rate, Low death rate
81. Which of the following is a key constituent of Solar ponds  
 a) fresh water at the top at ambient temperatures ( $\sim 30^{\circ}\text{C}$ )  
 b) salt water at the top at ambient temperatures ( $\sim 30^{\circ}\text{C}$ )  
 c) salt water at the top at high temperatures ( $\sim 90^{\circ}\text{C}$ )  
 d) fresh water at the top at high temperatures ( $\sim 90^{\circ}\text{C}$ )
82. According to Malthusianism  
 a) Population growth is linear and food supply is exponential  
 b) Population growth follows Geometric progression, food increase follows Arithmetic progression  
 c) Population growth follows Arithmetic progression, food increase follows Geometric progression  
 d) Population growth is logarithmic and food supply is exponential
83. National Land Reform Policy stresses on  
 a) Restoration of ecological balance                                      c) Tenancy reforms  
 b) Natural regeneration                                      d) Watershed approach
84. If 'I' is the impact of the population on the environment, 'P' is the size of the population, 'A' is the per capita affluence or consumption and 'T' is the damage caused by technologies, then which of the following equation is correct?  
 a)  $I = (P \times A)/T$                                       c)  $I = T/(P \times A)$   
 b)  $I = P \times A \times T$                                       d)  $I = P/(A \times T)$
85. The ratio of the concentration of a chemical in an organism to the concentration in the surrounding environment at steady state is known as \_\_\_\_\_.  
 a) Bio amplification constant                                      c) Bio-concentration factor  
 b) Bio-magnification factor                                      d) Bio-accumulation factor
86. Which agency issues the Ecomark notification?  
 a) Ministry of Environment, Forest and Climate Change  
 b) Ministry of Human Health and Family Welfare  
 c) Department of Science and Technology  
 d) Bureau of Indian Standards

87. The weather scale used to measure size of tropical cyclones is:
- a) Meso – scale
  - b) Micro – scale
  - c) Planetary scale
  - d) Synoptic scale
88. In accordance with the Indian EIA notification 2006, within how many days if Environmental Appraisal Committee do not specify the Terms of Reference, the proponent can go ahead with its own Terms of Reference?
- a) 15 days
  - b) 45 days
  - c) 60 days
  - d) 90 days
89. Which of the following medium is used in completed test of MPN which shows up as green sheen colonies for *E.coli*?
- a) Eosin Methylene Blue Agar
  - b) Blood Agar
  - c) Chocolate Agar
  - d) Sabouraud agar
90. Which of the following is best related to coral bleaching?
- a) Coral bleaching happens due to overfishing
  - b) Coral bleaching occurs due to cold temperatures of water
  - c) Loss of pigment due to dying of algal partner causes coral bleaching
  - d) Coral bleaching occurs due to rise in pressure of water column
91. An analytical device, used for the detection of a chemical substance that combines a biological component with a physicochemical detector is called:
- a) Bioindicator
  - b) Biosensor
  - c) Biodetector
  - d) Biochip
92. Bioluminescence is advantageous for the organism producing light, except for one of the following:
- a) It can startle the predator
  - b) It can be burglar alarm
  - c) It can help in mate recognition
  - d) It can cause death of the organisms in vicinity
93. The role of osmoprotectants such as Ubiquinone in Halophiles is:
- a) To protect them from heavy loss of water
  - b) To protect them from bursting of cell
  - c) To help them absorb nutrients better
  - d) To help them bear pressure of water column
94. If Net Ecosystem Production (NEP) is positive, it indicates the system is mainly
- a) Autotrophic
  - b) Heterotrophic
  - c) Saprophytic
  - d) Parasitic
95. \_\_\_\_\_ is the main function of HEPA installed in Laminar Air Flow chamber?
- a) To provide Moist Heat
  - b) To provide Dry Heat
  - c) To filter air entering into the hood
  - d) To spray sterilizing chemicals

96. In which of the following phase of bacterial growth curve, death rate becomes equal to growth rate?
- a) Lag phase
  - b) Log Phase
  - c) Stationary Phase
  - d) Death Phase
97. Which of the following component of membrane is found as an adaptation for microorganisms found at great depths with high pressure (barophiles)?
- a) Saturated fatty acids
  - b) Unsaturated fatty acids
  - c) Branched chain fatty acids
  - d) Trans fats
98. Type III survivorship curve is shown by
- a) Birds
  - b) Elephant
  - c) Insects
  - d) Monkeys
99. What soil order characteristically has calcite and/or halite in the B horizon and is common throughout the arid region?
- a) Alfisol
  - b) Aridisol
  - c) Entisol
  - d) Inceptisol
100. With reference to measurement of biodiversity, the total number of species present in a habitat can be termed as \_\_\_\_\_.
- a) Beta Diversity
  - b) Abundance
  - c) Species Richness
  - d) Density

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## **Rough Work**