1. Of the following types of ecosystems, which one acts as seasonal homes for migratory birds ?

(A) Savannahs

(B) Grasslands

(C) Wetlands

(D) Tundras

2. Ecologists often divide a lake into

(A) Four major zones

(B) Three major zones

(C) Eight major zones

(D) Nine major zones

3. The atmosphere is divided into spherical layers based upon the

(A) Density of each layer

(B) Concentration of ozone in each layer

(C) Temperature changes from variations in absorption of solar energy

(D) Concentration of oxygen in each layer

4. The atmospheric layer containing 75% of the mass of earth's air is the

(A) thermosphere

(B) mesosphere

(C) stratosphere

(D) troposphere

5. Which of the following animals have air sacs attached to their lungs ?

(A) Birds

(B) Mammals

(C) Amphibians

(D) Reptiles

6. Which of the following organisms would be members of a pioneer community on bare rock ?

(A) Grass

(B) Lichens

(C) Herbs

(D) Moss

7. The current global growth rate of the human population is about

(A) 1.4% per year

(B) 2.4% per year

(C) 3.8% per year

(D) 24% per year

8. To show how many organisms are at each level of a food chain, ecologists use a model called

(A) an energy flow pyramid

(B) a pyramid of numbers

(C) a pyramid of energy

(D) a food chain/food web pyramid

9. The area of sociology that covers the size, composition, and distribution of populations is called _____.

(A) geography

(B) environmental sociology

(C) demography

(D) anthropology

10. The Coriolis effect

(A) Earth's temperature

(B) results in ice and dark at the poles in winter

(C) is caused by earth's rotational forces

(D) keeps the wind circulating at constant speed around the planet

11. Air near Earth's surface tends to be

(A) warmer and wetter; then it rises, expanding and cooling

(B) warmer and drier; then it rises, condensing and gathering moisture

(C) cooler and wetter; then it rises, is warmed by the sun, and sinks again

(D) warmer; it rises as it is displaced by Coriolis forces

12. Which of the following is difference between the nitrogen and carbon cycles ?

(A) Nitrogen can exist as a solid but carbon cannot.

(B) Carbon is released through decomposition but nitrogen is not.

(C) Carbon is released through respiration but nitrogen is not.

(D) Carbon is cycled through animals but nitrogen is not.

13. Why are legumes such as peas and alfalfa considered good for soil ?

(A) They add valuable humus to the soil when they die and decay.

(B) They absorb water and help control runoff.

(C) Their leaves are able to photosynthesis at a very high rate.

(D) They have nitrogen fixing bacteria in their roots.

14. Which of the following is a way by which carbon dioxide can be removed from the air ?

(A) Building dams

(B) Planting trees

(C) Fertilizing crops

(D) Mining coal

15. Which of the following makes the nitrogen cycle unique ?

(A) It is the only nutrient cycle without a gas

(B) Nitrogen is always only a liquid

(C) Nitrogen is found in plants, animals and the soil

(D) Nitrogen requires specific bacteria for its cycle

16. Ozone in the upper atmosphere is produced from

(A) lightning

(B) photochemical reactions

(C) electrical appliances on Earth

(D) model fractals

17. Which of the following organisms does NOT require sunlight to live ?

(A) Chemosynthetic bacteria

(B) Algae

(C) Trees

(D) Photosynthetic bacteria

18. Nutrient cycling often operates at the scale of

(A) biogeographic scales

(B) closed systems

(C) individual scale

(D) local patches

19. The tendency of a plant to grow toward light is called

(A) photosynthesis

(B) photoinduction

(C) phototropism

(D) photolysis

20. Porous water-saturated layers of underground rock are known as

(A) aquifers

(B) recharge areas

(C) runoff areas

(D) water tables

21. Which gas exists in the highest concentration in the Earth's atmosphere ?

(A) Nitrogen

(B) Oxygen

(C) Radon

(D) Carbon dioxide

22. Since 1960, the atmospheric concentration of CO_2 has increased by about

(A) 25%

(B) 33%

(C) 22%

(D) 14%

23. The three soil primary essential elements are

(A) N, P, K

(B) C, H, O

(C) N, P, S

(D) C, N, K

24. How is carbon stored in the biosphere ?

(A) In the atmosphere as carbon dioxide

(B) Underground as fossil fuels and calcium carbonate rock

(C) In the oceans as dissolved carbon dioxide

(D) All of the above

25. Atolls are most probably formed by

(A) a rise in the earth's crust

(B) sand brought in from the mainland

(C) coral reef upbuilding during subsidence

(D) collapse of the center of a volcano

26. Which of the following best describes the earth's average surface temperature for the past 900,000 years ?

(A) A steady warming trend

(B) Fairly steady temperatures until recently

(C) Many fluctuations of several °C

(D) Fairly steady with occasional cool spells

27. The concentration of carbon dioxide in the troposphere around 1900 was closest to

(A) 280 ppm

(B) 290 ppm

(C) 320 ppm

(D) 360 ppm

28. Since 1861, mean global temperature has risen ____ degree(s) Centigrade.

(A) 0.1 – 0.3

(B) 0.6 – 0.8

(C) 1.0 – 1.5

(D) 1.5 – 2.0

29. Pollution discharge from a single source

(A) point-source pollution

(B) nonpoint-source pollution

(C) primary pollution

(D) water pollution

30. What kind of poisoning is known as plumbism ?

(A) Lead poisoning

(B) Arsenic poisoning

(C) Carbon monoxide poisoning

(D) Sulfur poisoning

31. When petroleum is refined it is subject to a number of processes including cracking. During the cracking process

(A) lighter hydrocarbons are combined to form heavier ones

(B) heavy hydrocarbons are broken up into lighter ones

(C) lighter hydrocarbons are separated by distillation

(D) oxygen is used to burn the heavier hydrocarbons

32. Which of the following is not a major pollutant from automobiles ?

(A) Carbon monoxide

(B) Unburned hydrocarbons

(C) Nitrous oxide

(D) Sulfur dioxide

33. CFCs take ____ years to reach the stratosphere

(A) 1 – 2

(B) 5 – 10

(C) 10 – 20

(D) 20 – 30

34. Damage to the ecological structure and function of lakes because of deeper penetration of UV light is caused by

(A) ozone depletion only

(B) acid deposition only

(C) global warming only

(D) a synergistic interaction among ozone depletion, acid deposition and global warming.

35. One of the potential health effects of exposure to high levels of noise is called Tinnitus, which means

(A) a permanent loss of hearing

(B) a persistent ringing or hissing in the ears after exposure

(C) a temporary loss of hearing, especially of upper frequencies

(D) abdominal discomfort from low frequency noise

36. The U.S. EPA recently concluded that environmental tobacco smoke should be considered

(A) "a possible human teratogen"

(B) "a priority air pollutant"

(C) "a known human carcinogen"

(D) "a possible human carcinogen"

37. The three important environmental properties that are often characterized with hazardous substances are

(A) Colour, Odour and Boiling point

(B) Toxicity, Persistence and Bioaccumulation

(C) Solubility, Chemical structure and Bioaccumulation,

(D) Odour, Melting point and Toxicity

38. A test frequently used in pharmaceutical industry to evaluate the potency of vitamins and pharmacologically active compounds is known as

(A) Bioassay

(B) Bio magnification

(C) Jar test

(D) BOD

39. The US EPA defines a hazardous waste by

(A) toxicity and reactivity

(B) corrosivity and ignitability

(C) all of the above

(D) none of the above

40. What is the most desirable method of dealing with municipal solid waste ?

(A) Land filling

(B) Incineration & Energy recovery

(C) Recycling

(D) Avoidance

41. Which of the following is not an approved method of land disposal for hazardous wastes ?

(A) Surface impoundments

(B) Burial of small containers on industrial sites

(C) Secure landfills

(D) Deep well injections

42. Which of the following is incorrect ?

(A) Current hazardous waste regulations control the transportation of hazardous waste

(B) Current hazardous waste regulations control the storage of hazardous waste

(C) Current hazardous waste regulations control the treatment and disposal of hazardous waste

(D) Current hazardous waste regulations limit the amount of hazardous waste that can be generated

43. Bacteria and fungal spores can be included as

(A) contributors to indoor pollutants

(B) VOCs and POPs

(C) problems in degrading the ozone layer

(D) sources of radon in the home

44. Statistical estimate of the dose necessary to kill 50% of a large population of test species under stated conditions is

(A) LD150

(B) LD50

(C) LD70

(D) LD100

45. The most popular indirect method of counting virus particles is

(A) By hemagglutination assay

(B) By counting plaque-forming units

(C) By colony counting

(D) Microscopically

46. Carbon dioxide is converted into carbonic acid in the cytoplasm of red blood cells by the enzyme

(A) Carbonic anhydrase

(B) Hemocyanin

(C) Oxyhemoglobin

(D) Carbon dioxide

47. The majority of carbon dioxide is transported in the blood

(A) bound to oxygen

(B) as bicarbonate ions in the red blood cells

(C) dissolved in the plasma

(D) as carbon monoxide in the red blood cells

48. Iron and manganese form insoluble compounds by reacting with

(A) Alum

(B) Lime

(C) Poly phosphate

(D) Dissolved oxygen

49. Chloramines are formed by the addition of chlorine and

(A) Ammonia

(B) Liquid nitrogen

(C) Soda ash

(D) Sodium fluoride

50. Which of the following is not a major contributor to the greenhouse effect ?

(A) Carbon dioxide

(B) Carbon monoxide

(C) CFCs

(D) Methane

51. Technological controls for particulates in industry include

(A) Scrubbers

(B) Precipitators

(C) Filters

(D) All of the above

52. Lead in drinking water can result in

(A) impaired mental functioning in children

(B) prostate cancer

(C) stomach disorders

(D) dysentery

53. An aquifer is associated with

(A) Water

(B) Groundwater

(C) Rain water

(D) Soil erosion

54. Contamination of water supply through fecal discharge is indicated by the presence of

(A) Escherichia coli

(B) Tapeworms

(C) Water weeds

(D) Algae

55. Saprophytic bacteria obtain their food from

(A) Dissolved iron

(B) Organic material

(C) Dissolved sulfur compounds

(D) Inorganics

56. Which of the following diseases is not considered to be water borne ?

(A) Smallpox

(B) Typhoid

(C) Cholera

(D) Dysentery

57. Black stains on plumbing fixtures can be caused by

(A) Magnesium

(B) Manganese

(C) Calcium

(D) Anaerobic bacteria

58. One atmosphere of pressure equals

(A) 760 mm Hg

(B) 380 mm Hg

(C) 660 mm Hg

(D) 160 mm Hg

59. Each of the following is one of the major classes of outdoor pollutants except

(A) Carbon oxides

(B) Smog

(C) Nitrogen oxides

(D) Sulfur oxides

60. The following are suspended particles except

(A) Dust and soot

(B) Pesticides

(C) Sulfuric acid

(D) Chlorofluorocarbons

61. The most harmful forms of suspended particulate matter (SPM) are typically

(A) fine particles (PM-10) and ultra fine particles (PM-2.5)

(B) coarse particles (PM-15) and fine particles (PM-10)

(C) wild fire particles

(D) sea salt nuclei

62. Photochemical smog is formed when primary pollutants interact with

(A) Sunlight

(B) Water vapour

(C) Sulfur dioxide

(D) Oxygen

63. Exposure to indoor formaldehyde pollution is least likely to cause

(A) Sensory irritation

(B) Headaches

(C) Chronic breathing problems

(D) Dizziness

64. WHO report suggest that lung cancer is the most serious health risk from exposure to _____ in indoor air.

(A) Ozone

(B) PAH

(C) Chlorine

(D) Carbon monoxide

65. Particulates can be removed from stack exhaust gases by all of the following methods except

(A) Baghouse filters

(B) Wet scrubbers

(C) Mini-incinerators

(D) Electrostatic precipitator

66. The Coburn-Forster-Kane equation is used to determine the levels of

(A) carbon monoxide to which a normal adult is exposed

(B) radiation to which a normal adult is exposed

(C) Levels of arsenic

(D) Mercury exposure

67. The contamination of the atmosphere by the introduction of pollutants from human and natural sources

(A) primary pollution

(B) water pollution

(C) irrigation

(D) air pollution

68. Urban air pollution _____, is a mixture of smoke and fog produced from industrial pollutants and burning fuels

(A) smog

(B) pH

(C) argon

(D) dissolved solids

69. The atmospheric condition in which warm air traps cooler air near earth's surface is

(A) Temperate rain forest

(B) Temperature inversion

(C) Temperate grassland

(D) Desalination

70. The most common unit used to measure budness (abbreviation db)

(A) decibel

(B) potable

(C) aquifer

(D) dam

71. What substance was used as a moderator for the chain reaction in the first nuclear reactor ?

(A) Graphite

(B) Boron

(C) Water

(D) Cadmium

72. Inorganic solids may also be called

(A) Volatile solids

(B) Loss on ignition

(C) Non-volatile solids

(D) Dissolved

73. A zeolite softening unit will replace calcium and magnesium ions with

(A) Cations

(B) Ion residuals

(C) Sodium ions

(D) Diatoms

74. Nuisance growth of aquatic plants and bloom-forming algae in natural waters is generally due to high concentrations of

(A) Carbon

(B) Sulphur

(C) Calcium

(D) Phosphorus

75. Algal blooms impart a distinct colour to water due to

(A) their pigments

(B) excretion of coloured substances

(C) formation of coloured chemicals in water facilitated by physiological degradation of algae.

(D) absorption of light by algal cell wall

76. World's most problematic aquatic weed is

(A) Azolla

(B) Wolffia

(C) Eichornia

(D) Trapa

77. The green scum seen in the fresh water bodies is

(A) blue green algae

(B) red algae

(C) green algae

(D) both (A) and (C)

78. Reduction in the number of organisms in wastewater may be accomplished by

(A) Pre & post chlorination

(B) Providing chlorine contact time

(C) Sedimentation

(D) All of the above

79. Drinking water limits for the chlorinated solvents are set at:

(A) Maximum solubility in water

(B) Less than the maximum solubility in water

(C) Greater than the maximum solubility in water

(D) None of the above

80. Chlorine leaks can be detected around a chlorine cylinder by the use of

(A) Soda ash

(B) Lime

(C) Ammonia

(D) Hypochlorite

81. Which form of hypochlorite is the most dangerous to handle ?

(A) Sodium

(B) Calcium

(C) Fluoride

(D) Chlorine

82. When should water quality samples for chlorine residual be analysed ?

(A) Immediately

(B) Within hour

(C) Within 8 hours

(D) Within 24 hours

83. How many coliform samples are required per month for a water system serving a population between 25 and 100 ?

(A) 1

(B) 2

(C) 3

(D) 4

84. What test method best determines chemical feed/dosage rates ?

(A) Turbidity

(B) Hardness

(C) Jar

(D) Hammer

85. What is the most common method used in labs to test for total coliform and E. coli ?

(A) Coliert

(B) DMA

(C) Green

(D) Lamp

86. A composite sample should never be used when sampling for which contaminant is ?

(A) Benzene

(B) Nitrate

(C) Bacteria

(D) Barium

87. Which of these indicates poor clarifier performance ?

(A) Low pH of waste waters and odours

(B) Loss of solids over effluent weir

(C) Floating clumps of sludge on water surface

(D) All of the above

88. Secondary or final clarifiers do which of the following ?

(A) Increase sludge digestion

(B) Remove biological solids from wastewater

(C) Dampen influent flow surges

(D) Prevent secondary flocculation from occurring

89. What does Activated sludge process mean ?

(A) Activated carbon is used in the process

(B) Activated air is used in the process

(C) The sludge particles are teeming with bacteria, fungi and protozoa

(D) The plant must be activated before the wastewater is treated

90. What best measures the efficiency of a trickling filter ?

(A) BOD

(B) pH

(C) Temperature

(D) Total solids

91. If wastewater recirculation rates are too high

(A) Solids will be washed out of the secondary clarifier

(B) Effluent sparkling clear

(C) BOD will reduced

(D) pH will be affected

92. Which one of the following terms does not refer to conditions of respiration ?

(A) Aerobic

(B) Anaerobic

(C) Parasitic

(D) Facultative aerobic

93. Hydraulic conductivity can be calculated by

(A) Darcy's law

(B) Quantum law

(C) Weins displacement law

(D) Carnot Cycle

94. The method of providing plants with water from sources other than direct precipitation :

(A) Irrigation

(B) Inorganic

(C) Air pollution

(D) Climate

95. Dams and reservoirs are very important in

(A) Water conservation

(B) Tropical rain forest

(C) Water pollution

(D) Water management projects

96. During the daytime, algal growth in a lake generally causes an increase in

(A) Water temperature

(B) Nitrate concentration

(C) DO content

(D) Ion concentration

97. The results of a 5 day CBOD test for composite samples of wastewater in a trickling filter plant are as follows:

Raw wastewater = 300 mg/l

Primary tank effluent = 200 mg/l

Final tank = 60 mg/l

What is the percentage reduction in the 5 day CBOD accomplished by the trickling filter and final tank only ?

(A) 47

(B) 65

(C) 70

(D) 80

98. At what stage in the wastewater treatment procedure would nutrients such as nitrogen and phosphorus be removed in a secondary treatment facility ?

(A) Never

(B) At the bar screen

(C) In settling tank

(D) On the trickling filter

99. How the biological oxygen demand gets affected with the increased presence of organic matter in water ?

(A) The oxygen demand decreases

(B) The oxygen demand remains unchanged

(C) The oxygen demand increases

(D) None of the above

100. The stage in which the biological processes is used to purify water in a wastewater treatment plants is called

(A) secondary sewage treatment

(B) primary sewage treatment

(C) wastewater reduction

(D) biochemical reduction

101. The results of settleability of the activated sludge in the aeration tank indicate that 90 percent of the volume is solids. This means that:

(A) No action is needed

(B) Excess solids should be removed

(C) Dissolved Oxygen should be lowered

(D) More solids should be introduced

102. Facultative ponds are

(A) Aerobic on the top and anaerobic on the bottom

(B) Anaerobic on the top and aerobic on the bottom

(C) Completely aerobic

(D) Very shallow ponds

103. The difference between the static level and the pumping level of a well is called the

(A) cone of depression

(B) drawdown

(C) settling zone

(D) radiance of influence

104. As per World Wide Fund for Nature, the river _____ is one of the ten most endangered rivers in world.

(A) Ganga

(B) Narmada

(C) Mahanandi

(D) Godavari

105. UNCED is

(A) An abbreviation for the Rio Conference on the Environment and Development in 1992

(B) United Nations Convention on Economic Development

(C) United Nations Century of Environmental Development

(D) United Nations Cultural and Educational Department

106. How far from the coastline are the territorial waters of a State in general ?

(A) 23 nautical miles

(B) 36 nautical miles

(C) 12 nautical miles

(D) 03 nautical miles

107. The Aarhus Convention from 1998 is

(A) On access to information and public participation in environmental matters

(B) Is a treaty regulating oil transports on the Baltic Sea

(C) A treaty of fishing quotas agreed between all States bordering the Baltic Sea

(D) A treaty regulating carbon dioxide

108. Water conservation includes

(A) drip irrigation in agriculture

(B) recycling of water in industrial use

(C) short showers, low flow shower head low flow toilets

(D) All the above

109. Major climate models project all of the following except

(A) A 2.4 to 5.4-degree centigrade rise in earth's mean surface temperature by 2100.

(B) An earth warmer than at any time in the last 10,000 years.

(C) The falling of global sea levels.

(D) More warming in the Northern Hemisphere than in the Southern Hemisphere

110. Spent fuel rods and obsolete nuclear weapons are examples of

(A) high-level nuclear waste

(B) recycled nuclear waste

(C) itinerant nuclear waste

(D) decommissioned waste

111. Currently, nuclear power provides approximately _____ of the world's energy.

(A) about 17%

(B) about 7%

(C) less than 1%

(D) about 37%

112. Which of the following hazards is not associated with a liquid metal breeder reactor (LMFBR) ?

(A) A sodium explosion occurs if it comes in contact with water

(B) The plutonium by-product can be made into nuclear weapons and, therefore, poses a security risk

(C) Reaction rates are very rapid

(D) Little fissionable material is formed

113. Precise measurement of Earth features can be obtained from

(A) high-oblique photographs.

(B) low-oblique photographs.

(C) vertical aerial photographs.

(D) all the above types of aerial photographs

114. What does GPS stand for

(A) Global Potential Satellite

(B) Geographic Positioning System

(C) Geodial Position Satellite

(D) Global Positioning System

115. Which Act gave the Environmental Protection Agency primary authority to establish water-quality standards ?

(A) The Water Pollution Control Act of 1972

(B) The Clean Water Act of 1977

(C) The 1987 Water Quality Act

(D) The Environmental Protection Act of 1970

116. A Statistical test used, when most of the data values are relatively small, but there are also a few relatively large values

(A) Chen test

(B) T-test

(C) Mean

(D) Median

117. To test for a difference between the true location (mean or median) of a population and a fixed threshold

(A) The Standard deviation

(B) The Wilcoxon Signed Rank Test

(C) Sign test

(D) None of the above

118. An F-test may be used to

(A) compare two population variances

(B) identify data points

(C) normal distribution

(D) average of data

119. Suppose X and Y are independent random variables. The variance of X is equal to 16; and the variance of Y is equal to 9. Let $Z = X - Y$. What is the standard deviation of Z ?

(A) 25

(B) 5

(C) 75

(D) 15

120. Which of the following is the best definition of standard deviation ?

(A) The typical amount by which scores differ from the mean of a set of scores.

(B) The mean squared deviation from the average.

(C) The average of a set of scores.

(D) The 'average' of the sum of squared deviations from the mean.

Space For Rough Work