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1. Which among the following is a weedicide?

- a. Agent green
- b. Herbicide orange
- c. Agent orange
- d. Both b & c

2. A bacterial species having generation time of 1 min. A scholar put the bacteria in an eppendroff tube at 9:00am. Exactly at 10:00am, the container was full. At what time was the container quarter full?

- a. 9:15am
- b. 9:58am
- c. 9:45am
- d. 9:48am

3. **Assertion A:** Slow sand filters are more efficient in removal of bacteria than rapid sand filters. **Reason R :** The sand used in slow sand filters is finer than that in rapid sand filters.

- a. Both A and R are true but R is not the correct explanation of A
- b. A is true but R is false
- c. A is false but R is true
- d. Both A and R are true and R is the correct explanation of A

4. Color test of water is done with an instrument called

- a. Colorimeter
- b. Turbidimeter
- c. Tintometer
- d. Nephelometer

5. Find out the dilution rate at the cell wash-out condition in a chemostat by applying Monod's model. Given: $K_s = 0.4 \text{ gL}^{-1}$, $S_0 = 20 \text{ gL}^{-1}$, $\mu_{\max} = 2 \text{ h}^{-1}$, $Y_{x/s} = 1 \text{ gg}^{-1}$

- a. 2 h^{-1}
- b. 1.02 h^{-1}
- c. 0.98 h^{-1}
- d. 2.49 h^{-1}

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6. The death of Scandinavian forests was blamed on:

- a. The Chernobyl disaster
- b. Pollution from UK power station
- c. Pollution from Scandinavian power stations
- d. Tree surgeons

7. Which of the following gases is not a green house gas?

- a. H₂O vapours
- b. CO
- c. CO₂
- d. CH₄

8. Diauxic growth pattern is associated with

- a. Absence of lag phases
- b. Sequential use of multiple substrates
- c. Multiple lag phases
- d. Both b & c

9. Which of the following addresses the problem of global warming?

- a. The Kyoto Agreement
- b. The CITES Treaty
- c. The Geneva convention
- d. The Rio-Summit

10. Organisms that generate energy using light are:

- a. Photo-organotrophs
- b. Photo-autotrophs
- c. Chemo-autotrophs
- d. Chemo-organotrophs

11. The amount of coagulant needed for coagulation of water increases with i) increase in turbidity of water ii) decrease in turbidity of water iii) increase in temperature of water iv) decrease in temperature of water The correct answer is

a. (ii) and (iii)

b. (i) and (iv)

c. (i) and (ii)

d. (ii) and (iv)

12. Box model is useful in studying

a. Air pollution dispersion

b. Water pollution dispersion

c. Soil pollution

d. Environmental pollution

13. The population (P) of an ecosystem is represented as $\frac{dP}{dt} = \alpha P - \beta P^2$, where α and β are constants. The maximum sustainable yield of this ecosystem will be

a. $\frac{\alpha}{\beta}$

b. $\frac{\alpha}{2\beta}$

c. $\frac{\alpha - \beta r}{\beta}$

d. $\frac{\alpha^2}{\beta}$

14. For stabilisation of sewage the ratio of oxygen available to the oxygen required is called as

a. Biological Oxygen Demand (BOD)

b. Relative stability

c. Oxygen ion concentration

d. Bacterial stability factor

15. What is the role of baffles in a bioreactor

a. Maintain uniform nutrient medium

b. Maintain uniform suspension of cells

c. Minimize the size of air bubble for better aeration

d. Prevent vortex and to improve aeration efficiency

16. The inhalation of _____ dust causes siderosis.

a. Cola

b. Silica

c. Iron

d. Asbestos

17. Match the method of separation with its principle

P. Filtration

1. Specific gravity

Q. Ultra filtration

2. Electric charge

R. Centrifugation

3. Molecular size

S. Ion exchange

4. Particle size

a. P-1, Q-2, R-4, S-3

b. P-4, Q-3, R-1, S-2

c. P-4, Q-1, R-3, S-2

d. P-1, Q-3, R-2, S-4

18. A sample of water requires 113 mL of distilled water to render the odour barely detectable. What is the TON (Threshold Odour Number)

a. 1.3

b. 2.3

c. 3.3

d. 4.3

19. When the electron acceptor is the nitrate ion, the process is called

a. Anaerobic

b. Oxic

c. Anoxic

d. Aerobic

20. When the total hardness of water is greater than its total alkalinity, the carbonate hardness will be equal to

a. Total hardness

b. Total alkalinity

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c. Total hardness - total alkalinity

d. Non carbonate hardness

21. The horizontally spread plume as a result of inversion is called

a. Coning

b. Looping

c. Fanning

d. Lofting

22. Type 1 settling is called

a. Discrete settling

b. Flocculent settling

c. Both a & b

d. None of the above

23. Assuming a river having chloride 0.5 gm^{-3} , BOD 0.3 gm^{-3} flowing at $80 \text{ m}^3\text{sec}^{-1}$ converge with another river having chloride 0.7 gm^{-3} , BOD 0.6 gm^{-3} flowing at a rate of $60 \text{ m}^3\text{sec}^{-1}$. If after the convergence chloride is 0.59 gm^{-3} , then the BOD is

a. 0.43 gm^{-3}

b. 0.83 gm^{-3}

c. 0.73 gm^{-3}

d. 0.92 gm^{-3}

24. Luxury uptake is a term associated with biological removal of

a. Nutrient

b. Phosphate

c. Nitrate

d. Nitrite

25. Bag filter design is dependent on gas temperature, as it affects the gas density & viscosity and the selection of filtering material. The pressure drop in a bag filter is

a. Inversely proportional to viscosity of gas.

b. Proportional to the viscosity & density of the gas.

c. Proportional to the pressure of the gas

d. Both (b) and (c)

26. Which of the following noise indices is used in ascertaining the quality of noise environment according to WHO standards?

- a. L_{50}
- b. L_{10}
- c. L_{eq} for 8 hours
- d. Instantaneous sound pressure level

27. Which state of Cr (Chromium) is most toxic

- a. Cr^{+4}
- b. Cr^{+3}
- c. Cr^{+5}
- d. Cr^{+6}

28. Quantity of 5M H_2SO_4 required to prepare 1000 mL of 0.1N H_2SO_4 is

- a. 20 mL
- b. 10 mL
- c. 200 mL
- d. 100 mL

29. Autoclaves are used for sterilization. It acts by

- a. Denaturing proteins
- b. Changing physically membrane lipids
- c. Disrupting cell membranes
- d. All of the above

30. In the material balance of a unit operation, which component will not be considered on the input side?

- a. Recycle
- b. By product
- c. Water/air
- d. Chemicals

31. Which of the following species is called atmospheric detergent?

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- a. Chlorine radical
- b. Hydroxyl radical
- c. Ozone radical
- d. Methyl radical

32. Match the analytical techniques with measured items.

- P. BET
 - Q. Nephelometry
 - R. XRF
 - S. FTIR
 - 1. Turbidity
 - 2. Elements
 - 3. Surface area
 - 4. Functional groups
- a. P-3, Q-1, R-2, S-4
 - b. P-2, Q-1, R-3, S-4
 - c. P-4, Q-3, R-2, S-1
 - d. P-1, Q-4, R-3, S-2

33. Hazardous wastes are having the following characteristics

- a. Ignitability, corrosivity, reactivity
- b. Corrosivity,
- c. Radioactivity, reactivity, toxicity
- d. All of the above

34. The chemical most commonly used to increase speed of sedimentation of sewage is

- a. Lime
- b. Copper sulphate
- c. Sodium permanganate
- d. Sulphuric acid

35. **Assertion A:** Chlorofluorocarbons deplete ozone.

Reason R: These compounds contain chlorine, fluorine and bromine.

- a. Both A and R are true but R is not the correct explanation of A
- b. A is true but R is false

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c. A is false but R is true

d. Both A and R are true and R is the correct explanation of A

36. In a fed-batch culture glucose solution is added with a flow rate of $2 \text{ m}^3\text{d}^{-1}$. The initial volume of culture is 6 m^3 . The volume of culture at the end of 3rd day is

a. 6 m^3

b. 8.75 m^3

c. 12 m^3

d. 6.67 m^3

37. Which of the following statement is not correct

a. Sun is the ultimate source of energy for any ecosystem

b. Ecosystem is an open system

c. Ecosystem is self sustaining and dynamic in nature

d. In an artificial ecosystem flow of energy is not unidirectional

38. What is the defining feature of exponential growth?

a. It lasts indefinitely

b. the growth rate is very high

c. The growth rate is constant

d. The growth rate increases rapidly over time

39. The molecular weight of KNO_3 is 101.1, the quantity of KNO_3 required to prepare 100 ppm nitrate solution is

a. 100 mg

b. 163 mg

c. 101 mg

d. 164 mg

40. Mufflers control the noise by

a. Absorption

b. Diffusion

c. Destructive interference

d. All of the above

41. The methods of sanitary land filling includes

- a. Area method
- b. Volume method
- c. Trench method
- d. Both a and c

42. Assertion A: The phosphorous cycle in an ecosystem is a sedimentary cycle.

Reason R: Phosphorous Occurs naturally in rocks.

- a. A is true but R is false
- b. A is false but R is true
- c. Both A and R are true but R is not the correct explanation of A
- d. Both A and R are true and R is the correct explanation of A

43. If noise of 90 dB for 8 h represents 100% dose, then the noise of 93 dB for 1 h corresponds to

- a. 3% dose
- b. 25% dose
- c. 12.9% dose
- d. 50% dose

44. Quantitative test for coli form group includes

- a. Membrane filter technique
- b. Multiple tube technique
- c. Presumptive test
- d. Both a and b

45. Carbonate Compensation Depth (CCD) in marine ecosystem is defined as the depth at which

- a. Carbonate begins to precipitate
- b. Bicarbonate begins to precipitate
- c. Bicarbonate begins to dissolve
- d. Carbonate begins to dissolve

46. Acid rain transported to the surface of earth by mechanism of

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- a. Dry deposition
- b. Wet deposition
- c. Both of the above
- d. None of the above

47. Imhoff tank is used for

- a. Sludge digestion and sedimentation
- b. Demineralization
- c. Filtration and flocculation
- d. Distillation

48. Dobson unit is the measure of

- a. Intensity of sound
- b. Intensity of light
- c. Frequency of Sound wave
- d. Frequency of light wave

49. Match the following and identify the correct answer.

P. Point of initial movement during earthquakes

1. Richter scale

Q. Measurement of magnitude of earthquake

2. Tsunami

R. Earthquakes generated water waves in coastal areas

3. Focus

S. Measurement of solar radiation incident on earth

4. Insolation

a. P-3, Q-1, R-2, S-4

b. P-1, Q-2, R-3, S-4

c. P-4, Q-3, R-2, S-1

d. P-3, Q-1, R-4, S-2

50. Solid waste collection systems are

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- a. Hauled container system
- b. Stationary container system
- c. Both a and b
- d. none of the above

51. The characteristics of species diversity are as follows. Choose the correct combination of characteristics for more species diversity of an ecosystem

- i. More dominance
 - ii. Less dominance
 - iii. More richness
 - iv. Less richness
 - v. More evenness
 - vi. Less evenness
- a. ii, iii and v
 - b. iii, i and iv
 - c. vi, iv and ii
 - d. i, iii and v

52. Correct sequence of events in environmental clearance for new projects

- a. Appraisal, Screening, Scoping, Public consultation
- b. Screening, Public consultation, Scoping, Appraisal
- c. Screening, Appraisal, Scoping, Public consultation
- d. Screening, Scoping, Public consultation, Appraisal

53. Match the waste class with the colour code of the collection container

- P. Human anatomical waste
 - 1. Green
 - Q. Discarded glass ware
 - 2. Blue
 - R. Waste scarp
 - 3. Red
 - S. Disposable plastics
 - 4. White
- a. P-3, Q-1, R-2, S-4
 - b. P-3, Q-4, R-2, S-1

c. P-4, Q-3, R-2, S-1

d. P-2, Q-1, R-3, S-4

54. Assertion A: Aerodynamic diameter is used to characterize the size of an aerosol

Reason R: the aerosol particles may be of irregular shape.

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 false but R is true

d. A is true but R is false

55. Bulking of sewage sludge is frequently associated with

a. High C : N ratio

b. High DO level

c. High C : P ratio

d. All of the above

56. The combination of primary and secondary treatment reduces the original sewage BOD by

a. 30-40%

b. 40-50%

c. 50-60%

d. 60-70%

57. Identify the correct sequence of gases in the decreasing order of their contribution to global warming

a. CFCs > CO₂ > CH₄ > N₂O

b. CO₂ > CH₄ > N₂O > CFCs

c. CO₂ > CH₄ > CFCs > N₂O

d. CFCs > CH₄ > N₂O > CO₂

58. Molar concentration of pure water is

a. 1M

b. 18M

c. 55.5M

d. 5.55M

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59. Alkalinity in river waters is caused due to

a. K^+ and SO_4^-

b. Na^+ and Cl^-

c. Na^+ and K^+

d. CO_3^- and HCO_3^-

60. Oxygen toxicity is caused by

a. Inhalation of molecular oxygen

b. Generation of free radicals

c. Interaction of singlet oxygen with membrane

d. None of the above

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1. d	2. b
3. d	4. c
5. a	6. b
7. b	8. d
9. a	10. b
11. b	12. a
13. c	14. b
15. d	16. c
17. b	18. b
19. c	20. b
21. c	22. a
23. a	24. b
25. d	26. c
27. d	28. b
29. d	30. b
31. b	32. a
33. d	34. a
35. b	36. c
37. d	38. c
39. b	40. d
41. d	42. d
43. b	44. d
45. c	46. c
47. c	48. a
49. a	50. c
51. a	52. d
53. b	54. d
55. c	56. d
57. b	58. c
59. c	60. b