1. The list of industrial sources of air pollution and their emissions are given. Match the following.

P.Ammonia   1. Carbon monoxide

Q. Plating   2. Particulates

R. Fertilizers   3. Metal fumes

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

c. P-1, Q-3, R-2   d. P-2, Q-1, R-3

2. If 2% solution of a sewage sample is incubated for 5 days at 20°C and depletion of oxygen was found to be 5 ppm, B.O.D. of the sewage is

a. 200 ppm   b. 225 ppm

c. 250 ppm   d. 275 ppm

3. Assertion A: The consumption of water increases with increase in the distribution pressure.
Reason R: Higher distribution pressure causes more loss and waste of water.

a. A is true but R is false   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. Both A and R are true and R is the correct explanation of A

4. Match the contaminants with the disease.

P. Arsenic   1. Itaiitai

Q. Cadmium   2. Silicious

R. Coal   3. Dysathria

S. Mercury   4. Skin caner

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

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

5. Which of the following is true about carbon monoxide?

a. Single largest source is from internal combustion engines

b. Results from the actions of ultraviolet light on ozone

c. Causes acid rain

d. Leading cause of cancer in smokers

6. Disinfection of water is done by

a. Ozone

b. Filtration

c. Heating and cooling

d. Passing chlorine

7. Match the following and identify the correct answer.

P. PO_4^- 1. Global warming

Q. N_2O 2. Eutrophication

R. NO_3^- 3. Respiratory disease

S. NO   4. Limiting nutrient

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

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

8. Tolerable limit of nitrogen oxides in air is _____ ppm.

a. 0.5   b. 2.5

c. 5   d. 7.5

9. In measurement of decibel (dB), the reference intensity taken is

a. $1*10^{-12}$ W/m²   b. $10*10^{-12}$ W/m²

c. $0.1*10^{-12}$ W/m²   d. $5*10^{-12}$ W/m²

10. Match the following and choose the correct answer.

P. 21st March	1. World atmosphere day
Q. 10thApril	2. World water and sanitation day
R. 22nd May	3. World forest day
S. 22nd March	4. Bio-diversity day
a. P-2, Q-1, R-4, S-3	b. P-3, Q-1, R-4, S-2
c. P-4, Q-3, R-2, S-1	d. P-1, Q-4, R-3, S-2

11. The toxicity of Ca-45 is related to

a. Thyroid   b. Bone

c. Teeth   d. Blood

12. Formula of bacterial cells is

a. $C_5H_7O_2N$ b. $C_6H_{12}O_6$

c. $C_7H_5O_2N$ d. $C_2H_7O_3N$

13. The working conditions in imhoff tanks are

a. Aerobic in lower compartment and   b. Aerobic only
anaerobic in upper compartment

c. Anaerobic in lower compartment and   d. Anaerobic only
aerobic in upper compartment

14. In a sludge tank, the gas mainly produced, is

a. Oxygen   b. Nitrogen

c. Carbon dioxide   d. Methane

15. What percentage of total world production of carbon dioxide do the developed countries contribute?

a. About 25%   b About 60%

c. About 75%   d. About 90%

16. Exposure to small amount of _____ results in high blood pressure & heart disease in human beings.

a. Mercury   b. Asbestos

c. Hydrogen sulphide   d. Cadmium

17. Sulphur dioxide can be measured by

a. Ultraviolet pulsed fluorescence   b. Permeation tube calibration

c. Both   d. None

18. Ground water has to be treated with impurities like hardness, microorganisms and low dissolved Oxygen concentration along with different gases. What will be the proper treatment process from the following options:

a. Sedimentation; Filtration; Coagulation   b. Aeration; Sedimentation; Softening;
Flocculation; Disinfection   Disinfection

c. Aeration; Sedimentation; lime soda process;   d. Screen; Filtration; Softening; Disinfection
Filtration

19. The dimensions of a rectangular settling tank are: length 24 m, width 6 m and depth 3 m. If 2 hour detention period for tanks is recommended, the rate of flow of sewage per hour, is

a. 204 cu m   b. 194 cu m

c. 214 cu m   d. 204 cu m

20. Lead emissions since the early 1980s have

a. Increased

b. Decreased

c. Remained same

d. Cannot be answered

21. The solar energy distributed per unit surface area of earth is

a. 142 W/m^2

b. 242 W/m^2

c. 342 W/m^2

d. None

22. The normal length of a sedimentation tank to remove suspended particles from water should not be more than _____ time of its Width:

a. 2

b. 4

c. 6

d. 8

23. The algae dies out in the zone of

a. Degradation

b. Recovery

c. Cleaner water

d. Active decomposition

24. The self-cleaning velocity normally adopted for sewers is?

a. 0.85 m/sec

b. 0.75 m/sec

c. 0.45 m/sec

d. 0.55 m/sec

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

d. A is false but R is true

26. The suitable method of forecasting population for a young and rapidly increasing city is

a. Arithmetical increase method

b. Incremental increase method

c. Graphical method

d. Geometrical increase method

27. Pick up the incorrect statement from the following :

a. The process of decomposing the organic matter under controlled anaerobic conditions, is called sludge digestion

b. Sludge digestion is carried out in sludge tank

c. The gases produced in sludge digestion process, contain 75% carbon dioxide

d. The gases produced in sludge digestion process, contain 75% methane

28. The ambient lapse rate generally is

a. 6.5 °C/km

b. 10 °C/km

c. -6.5 °C/km

d. -10 °C/km

29. A sewer pipe contains 1 mm sand particles of specific gravity 2.65 and 5 mm organic particles of specific gravity 1.2, the minimum velocity required for removing the sewerage, is

a. 0.45 m/sec

b. 0.35 m/sec

c. 0.55 m/sec

d. 0.25 m/sec

30. The minimum width of a sewer trench in mm must be greater than; where D is the external diameter of sewer in mm:

a. 1.5 D+ 100

b. 1.5D +300

c. 1.5D +400

d. D +1000

31. Select the correct relationship between porosity (N), specific yield (Y) and specific retention (R)

a. $N = Y + R$

b. $Y = N + R$

c. $R = N + Y$

d. $Y > (R + N)$

32. The Design Period of Ground Water supplies are usually selected as:

a. 5 Years

b. 10 Years

c. 25 Years

d. 50 Years

33. The minimum area of land desirable for sanitary landfill that is sufficient to operate for at least:

a. One year

b. Six months

c. Nine months

d. None of these

34. In Indian context, where rainfall is mainly confined to one season, the suitable sewerage system will be

a. Combined system

b. Partial combined system

c. Partial separate system

d. Separate system

35. The correct relation between theoretical oxygen demand (TOD), Biochemical oxygen demand (BOD) and Chemical oxygen demand (COD) is given by

a. $TOD > BOD > COD$

b. $TOD > COD > BOD$

c. $BOD > COD > TOD$

d. $COD > BOD > TOD$

36. 3.0 ml of raw sewage is diluted to 300 ml. The D.O. concentration of the diluted sample at the beginning of the test was 8 mg/l. After 5 day-incubation at 20°C, the DO concentration was 5 mg/l. The BOD of raw sewerage is

a. 100 mg/l

b. 250 mg/l

c. 300 mg/l

d. 200 mg/l

37. Ozone of found in

a. Mesosphere

b. Stratosphere

c. Ionosphere

d. Exosphere

38. If BOD of a town is 20000 kg/day and BOD per capita per day is 0.05 kg, then population equivalent of the town is

a. 40000

b. 400000

c. 100000

d. 10000

39. Which of these is not caused/aggravated by atmospheric pollution?

a. Asthma

b. Nice sunsets

c. Hay fever

d. Global warming

40. The major gases produced from sanitary landfill are due to:

a. Anaerobic decomposition of biodegradable organic matter

b. Aerobic decomposition of biodegradable organic matter

c. Anaerobic decomposition of non-biodegradable organic matter

d. None of these

41. In a well-planned city, developed recently the layout of distribution pipes system generally adopted is:

a. Ring system

b. Grid Iron system

c. Radial system

d. All of the above

42. In general, the organic waste material that decomposes rapidly (3 to 5 years) is:

a. Food waste

b. News paper

c. Leaves

d. All of these

43. Groundwater is usually free from

a. Dissolved impurities

b. Suspended impurities

c. Both of these

d. None of the above

44. The most common cause of acidity in water is

    a. Carbon dioxide

    b. Oxygen

    c. Hydrogen

    d. Nitrogen

45. Which of the following is a fermentation product of molasses?

a.Acetone

b.Methanol

c. Ammonia

d. Formaldehyde

46. The process of nutrient enrichment is termed as

a.Eutrophication

b.Schistosomiasis

c. Enrichment

d. Limiting nutrients

47. Which microorganism can live alone?

a.Fungi

b. Amoeba

c. Algae

d. All of the above

48. Temporary hardness of water may be removed by adding

a. Calcium chloride

b. Calcium carbonate

c. Calcium hydroxide

d. Sodium bicarbonate

49. Coliform bacteria in water is an indication of the presence of

a. Excess fertilizer

b. Radioactive wastes

c. Human faeces

d. Decaying animals and plants

50. Nitrous oxide is also known as

a. Laughing gas

b. Natural gas

c. Tear gas

d. Marsh gas

51. In chlorination, with the rise in temperature of water, death rate of bacteria

    a. Increases

    b. Decreases

    c. Remains unaffected

    d. None of the above

52. Which of the following compounds is widely used for algae control

    a. Sodium sulphate

    b. Copper sulphate

    c. Sodium chloride

    a. Calcium chloride

53. Which of the following might retards the self-purification of stream

    a. Higher temperature

    b. sunlight

    c. Satisfying oxygen demand

    d. None of the above

54. Standard Bod is measured at

    a. $20°C - 1$ Day

    b. $25 C° - 3$ Day

    c. $20°C - 5$ Day

    d. $30°C - 5$ Day

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

a. Total hardness - total alkalinity

b. Total alkalinity

c. Total hardness

d. No carbonate hardness

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

a. Copper sulphate

b. Sodium permanganate

c. Sulphuric acid

d. Lime

57. 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)

58. Most of the bacteria is

    a. Parasitic

    b. Saprophytic

    c. Pathogenic

    d. Anaerobic

59. The rate of BOD exerted at any time is

    a. Directly proportional to BOD satisfied

    b. Directly proportional to BOD remaining

    c. Inversely proportional to BOD satisfied

    d. Inversely proportional to BOD remaining

60. Which of the following unit works in aerobic conditions

    a. Sludge digestion tank

    b. Sedimentation tank

    c. Activated sludge treatment

    d. Trickling filter