

Uka Tarsadia University(Diwaliba Polytechnic)
Diploma in Chemical Engineering
Objective Type Questions (Pollution Control and Effluent Treatment)

Unit 1: Collection Method for Air Pollutant Sample

- 1) The maximum size of fly ash is _____
 - a) 1 μ m
 - b) 100 μ m
 - c) 1000 μ m
 - d) 10 μ m
- 2) The minimum size of the smoke particle is _____
 - a) 0.2 μ m
 - b) 1 μ m
 - c) 0.8 μ m
 - d) 0.5 μ m
- 4) Which of the following equipment is used for determining the concentration of dust accurately?
 - a) Screener
 - b) Air Dryer
 - c) Jas Filter
 - d) Dust Fall Jar
- 5) For determining the concentration of dust, continuous sampling is carried out by manual means.
 - a) True
 - b) False
- 6) To measure dust particulates in the foundry, dry dust technologies are mostly preferred than the wet dust technologies.
 - a) True
 - b) False
- 7) HVS is known as

High Volume Sampler

High Value Sampler

High Volume Solution

High Value Solution
- 8) Dust Fall Jar is used to collect

Particulate Matter

Sulphur Dioxide

Nitrogen Dioxide

Hydrocarbon gas

9) The function of the impinger tube is to collect

Gaseous Sample

Liquid Sample

Solid Sample

Semisolid Sample

10) Rotameter is variable area flowmeter used to measure

Solid flow

Liquid flow

Gas flow

Both liquid flow and gas flow

12) Impinger tube is made of _____ material.

PVC

Teflon

Glass

Porcelain

13) In grab sampling the air sample is collected in vacuum flask.

True

False

14) The moving part in the rotameter is known as

Spring

Throat

Float

None of the above

15) A dust fall jar is an closed container used to collect large particles from the air

True

False

16) The collection bowl of a dust fall jar is made of _____ material

HDPE

LDPE

Glass

None of the above

17) In dust fall jar, sedimentation is one of the simplest techniques for collection of coarse particulate matter.

True

False

18) The high volume air sampler collects suspended particulates on

Very small filter paper

Large filter paper

Thimble

None of the above

19) The high-volume sampler consists

Blower

Filter paper and filter supporting device

Rotameter

All of the above

20) Dust fall jar is used to collect particles more than 10 micron size.

True

False

21) Greenburg-Smith type Impinger tube can handle the sample flow rate of about _____ litres per minute.

10

30

40

50

22) Midget type Impinger tube can handle the sample flow rate of about _____ litres per minute.

3

9

15

20

23) The most commonly used solid adsorbent(s) for collection of gaseous samples is/are
Activated Charcoal

Silica gel

Above both

None of the above

24) Simple bubbler tube for the collection of gaseous sample is not expensive.

True

False

25) In freeze out sampling cold traps are connected in

Series

Parallel

Both Series and parallel

None of the above

26) The temperature of ice water should be attained _____⁰C during freeze out sampling.

-5

0

-4

-6

27) The temperature of ice salt should be attained _____⁰C during freeze out sampling.

-5

-11

-21

-41

28) The temperature of Dry ice and Acetone should be attained _____⁰C during freeze out sampling.

-79

-59

-49

0

29) The temperature of liquid air should be attained _____⁰C during freeze out sampling.

-200

-147

-80

-50

30) The temperature of liquid oxygen should be attained _____⁰C during freeze out sampling.

-183

-213

-150

-50

31) The temperature of liquid nitrogen should be attained _____⁰C during freeze out sampling.

-156

-106

-96

-196

32) Typical Dust fall Jar consists of about _____cm to _____cm height.

20, 35

40, 50

51, 70

71, 80

33) Typical Dust fall Jar consists of about _____cm to _____cm diameter.

5, 7

10, 15

20, 25

30, 35

34) Dust fall jar requires electric power to operate

True

False

35) The Dust fall jar is to be kept in atmosphere for the period of _____month to collect sample dust.

1

2

3

4

36) For the collection of dust particles by the sedimentation method through Dust fall jar is expensive method.

True

False

37) The high volume filtration method is popular for measurement of the mass concentration of suspended particulates smaller than _____ μm .

1

10

50

100

38) _____ consists inclined roof.

Dust Fall Jar

High Volume Sampler

Stack Analysis Device

None of the above

39) _____fibre filter is used in High Volume Sampler for collection of particulate matter.

Cotton

Glass

Plastic

None of the above

40) In high volume sampling method, the particulate level is generally expressed in terms of $\mu\text{g}/\text{m}^3$ of air.

True

False

41) Gaseous air pollutants can be collected by the method of

Grab Sampling

Absorption in liquids

Adsorption on solid material

All of the above

42) Stack sampler device consists _____ to collect particulate matter inside the stack.

Small Filter Paper Sheet

Large Filter Paper Sheet

Thimble

None of the above

43) _____ is used to collect particulate from chimney.

Dust Fall Jar

High Volume Sampler

Stack Sampler

None of the above

44) Velocity of the chimney gas can be measured by pitot tube.

True

False

45) In stack sampling the particulate matter and gaseous samples are collected at the _____ of stack.

Bottom part

Upper part

Above both

None of the above

46) Stack gaseous emission for the parameters should be carried out _____ basis.

a) Annual

b) Quarterly

c) Monthly

d) Hourly

47) In grab sampling, the sample is not collected by filling an inflatable bag.

True

False

48)

Particles having diameter greater than $75\text{ }\mu\text{m}$ (micrometer = 10^{-6} mm) are called

- A. grit
- B. dust
- C. powder
- D. smoke

49)

Which of the following is the most severe air pollutant ?

- A. hydrocarbons
- B. NO_x
- C. SO_2
- D. CO

50) 'Particulate' air pollutants are finely divided solids and liquids. Which of the following is not a 'particulate' ?

- A. Dust & mists
- B. Smoke & fumes
- C. Photochemical smog & soot
- D. None of these

51) High Volume Sampler requires electric power to operate

True

False

52) In a high volume sampler, the filter paper is wetted before use.

True

False

53) For the absorption of gaseous sample activated charcoal is widely used.

True

False

54) NH_3 is Soluble in water.

True

False

55) _____ is used to absorb the moisture in Desiccator.

Copper Oxide

Silica Beads

Magnesium Oxide

None of the above

Unit 2: Controlling of Air Pollution

1) Which of the following air pollution control device has maximum efficiency?

- a) Electrostatic precipitator
- b) Dynamic precipitator
- c) Spray tower
- d) Wet cyclonic scrubber

2) Which of the following fluid is used in web scrubbers?

- a) Lime
- b) MgSO_4
- c) NaCl
- d) $\text{K}_2\text{Cr}_2\text{O}_7$

3) Which of the following is incorrect regarding the fabric filter?

- a) They can remove very small particle
- b) They are liable to chemical attack
- c) They have low efficiency in comparison to venturi scrubber
- d) They can handle large volume of gas at relatively high speed

4) Which of the following removes both gaseous and particulate contaminants?

- a) Venturi scrubber
- b) Gravitational settling chamber
- c) Dynamic precipitator
- d) None of the above

5) Ocean is a source for carbon monoxide.

- a) True
- b) False

6) Which of the following is an inorganic pollutant?

- a) Carbon monoxide
- b) Carbonyl compound
- c) Aromatic hydrocarbon
- d) None of the mentioned

7) Which is the major source for sulphur dioxide?

- a) Volcanic eruptions
- b) Coal and crude oil combustion

- c) Burning of petrol
- d) Sewage treatment process

8) Which is the largest source for production of nitrous oxide?

- a) Chemical industry
- b) Fertiliser industry
- c) Fossil fuel combustion
- d) Bacterial action

9) Which of the following devices is NOT used to control particulate emissions?

- a) Electrostatic precipitator
- b) Bag filters
- c) Catalytic converters
- d) All of the mentioned

10) Which of the mentioned devices are used for removing vapour phase/ gaseous pollutants?

- a) Absorption towers
- b) Catalytic converters
- c) Thermal oxidisers
- d) All of the mentioned

11) Aerosols contribute to global warming.

- a) True
- b) False

12) Which of the following air pollution control devices is suitable for the removing the finest dust from the air?

- (a) Cyclone separator
- (b) Electrostatic precipitator
- (c) Fabric filter
- (d) Wet scrubber

13) Electrostatic precipitator is used to control--

- 1 Water pollution
- 2 Solid waste
- 3 Noise pollution
- 4 Air pollution

14)

Operating principle of cyclone separator is based on the action of _____ dust particles.

- A. diffusion of
- B. centrifugal force on
- C. gravitational force on

D. electrostatic force on

15)

Maximum allowable concentration of CO₂ in air for safe working is _____ ppm (parts per million).

- A. 50
- B. 1000
- C. 2000
- D. 5000

16)

H₂S present in gaseous stream can be removed by adsorption on

- A. silica gel
- B. activated carbon
- C. bog iron
- D. limestone powder

17)

Which is a secondary air pollutant ?

- A. Photochemical smog
- B. Sulphur dioxide
- C. Nitrogen dioxide
- D. Dust particles

18)

Which of the following dust collection equipments is the least efficient (for sub-micronic particles) ?

- A. Dust catcher (gravity type)
- B. Cyclone separator
- C. Bag filter
- D. Hollow wet scrubber

19)

Bag filter design is predominantly 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. proportional to the viscosity & density of the gas.
- B. proportional to the pressure of the gas.
- C. Above both
- D. inversely proportional to viscosity of gas.

20)

Dust collection efficiency of a cyclone separator depends upon its

- A. diameter.
- B. inlet gas velocity.
- C. overall height.
- D. all (a), (b) & (c).

21)

Most efficient and suitable dust removal equipment for removal of flyash from flue gas in a thermal power plant is the

- A. gravity settling chamber
- B. cyclone separator
- C. electrostatic precipitator
- D. bag filter

22)

Main pollutant present in automobile exhaust is

- A. CO
- B. CO₂
- C. NO
- D. hydrocarbons

Answer: Option A

23)

Which of the following is an adsorbent used for the removal of SO₂ from gas/air ?

- A. Bog iron
- B. Limestone powder or alkalisied alumina
- C. Silica gel
- D. Active carbon

24)

Higher concentration of nitrogen dioxide in atmospheric air causes

- A. cancer
- B. bronchitis
- C. asphyxiation
- D. corrosion

25)

Ozone is

- A. a primary pollutant.
- B. a secondary pollutant.
- C. impervious to ultra-violet rays.
- D. both (b) and (c)

26)

_____ plant emits large amount of SO₂ as an air pollutant.

- A. Nitric acid
- B. Sulphuric acid
- C. Chloralkali
- D. Iron & steel

27)

Carbon monoxide is a pollutant, which causes

- A. respiratory disease (e.g. asthma).
- B. asphyxiation (suffocation) leading to death.
- C. retardation in crop growth.
- D. damage to building materials like marble.

28)

Which of the following is an adsorbent for removal of nitrogen oxides from gas/air ?

- A. Active carbon
- B. Silica gel
- C. Bog iron (iron oxide)
- D. Pulverised limestone

29)

Smog is

- A. nothing but black smoke.
- B. a combination of smoke and fog.
- C. a liquid particle resulting from vapor condensation.
- D. a solid particle

30)

Which is the most efficient dust removal equipment for removal of sub-micronic dust particles from blast furnace gas ?

- A. Packed scrubber
- B. Gravity settling chamber
- C. Electrostatic precipitator
- D. Hydrocyclone

31)

White smoke coming out of the chimney of a furnace indicates the use of

- A. low excess air.
- B. very high excess air.
- C. gaseous fuel in the furnace.
- D. liquid fuel in the furnace.

32)

Sulphur dioxide present in the industrial chimney exhaust gases causes

- A. respiratory & lung disease.
- B. reduction in plant's productivity owing to acid rain.
- C. corrosion of building materials.
- D. all (a), (b) and (c).

33)

The maximum CO₂ is emitted into the atmosphere by

- A. combustion
- B. urea
- C. biomass burning
- D. trees

34) The efficiencies of gravitational settling chambers are quite low for particles smaller than _____ μm .

150

100

50

200

35) Cyclone separators are effective in the removal of much smaller particles than gravitational settling chamber.

True

False

36) Cyclone separator requires very large space to handle the particulate matter than gravitational settling chamber.

True

False

37) Fabric filter systems typically consist of a _____ bag.

Rectangle

Square

Tubular

None of the above

38) In the fabric filter systems, structure in which the bags hang is known as _____.

Warehouse

Baghouse

Dust house

None of the above

39) In the fabric filter, the particles are deposited at the outside of bags.

True

False

40) The particles in the air stream are collected at the _____side of Bag filter.

Top

Bottom

Above both

None of the above

41) In the fabric filtration systems, the maximum usable temperature of cotton wool (Fibre) bag is around _____ °C.

100-120

85-95

50-60

121-150

42) In the fabric filtration systems, the maximum usable temperature of Polyamide (Nylon Fibre) bag is around _____ °C.

100

200

150

250

43) In the fabric filtration systems, the maximum usable temperature of Polyester (Fibre) bag is around _____ °C.

100

135

155

195

44) In the fabric filtration systems, the maximum usable temperature of Teflon (Fibre) bag is around _____ °C.

160

60

260

100

45) In the fabric filtration systems, the maximum usable temperature of Glass (Fibre) bag is around _____ °C.

280

320

550

200

46) Very high DC voltage of the order of _____ kV is applied to the electrostatic precipitator.

10

50

100

150

47) The basic function of wet scrubber is to provide contact between the scrubbing liquid and the particulate to be collected.

True

False

48) Venturi scrubbers are very effective for collecting particles smaller than _____ μm.

3

50

150

100

49) In the spray tower, the polluted gas entered at the top of the tower and flows downward.

True

False

50) The smallest part of the venturi scrubber where dirty gas and scrubbing media contacted with each other is known as

Float

Throat

Plot

None of the above

51) For the hydrodesulphurization of coal, _____ oil is used.

Olive

Coconut

Anthracene

Corn

52) Polluted hydrocarbon cannot be adsorbed on the granular activated carbon.

True

False

53) Wet scrubber requires higher proportion of energy

True

False

54) Initial cost of electrostatic precipitator is very low.

True

False

55) Sources of Activated carbon is/are

Wood

Coconut

Petroleum feed stock

All of the above

56) Magnesium nitrate is used for the Control of

SO_x

NO_x

Hydrocarbon

PM

57) Condensation method is used for controlling of

SO_x

NO_x

Hydrocarbon

PM

58) Incineration process is used for the controlling of Hydrocarbon

True

False

59) Alkalized alumina process is used for the controlling of NO_x.

True

False

Unit : 3 Environmental Audit and ISO 14001

1) Which of the following item is not included in Environmental Auditing?

- a) Pollution Monitoring Schemes
- b) Storage of toxic chemicals
- c) Scrutiny by the government agencies
- d) Safety provisions for Industrial Works

Ans C

2) Various types of quality audits are:

- a) Product
- b) Process
- c) management (system)
- d) registration (certification)
- e) All of above

Ans : e

3) The time required and costs involved in an external audit are much higher as compared to internal audits.

- a) True
- b) False

Ans: a

4) Each of the three parties involved in an audit plays a role that contributes to its success.

- a) the client, the auditor, and the auditeer
- b) the client, the auditor, and the audite
- c) the client, the moderator, and the auditee
- d) the client, the auditor, and the auditee

Ans: D

5) Which of the certification systems EMAS or ISO 14001 is the most challenging for a company

- a). EMAS
- b). ISO 14001

c). They are in principle the same

Ans: A

6) Which of these energy sources is renewable

A. Wind

B. Nuclear

C. Coal

D. Oil

Ans: A

7) What is most land used for

A. Buildings

B. Roads

C. Agriculture

D. Leisure

Ans: C

8) EAR stands for

a) Energy Area Report

b) Environmental Audit Report

c) Above Both

d) None of the above

Ans : B

9) Environmental Audit team consists _____ member (s).

1

2

3

4

10) Environmental Auditing is one type of consulting activity.

a) True

b) False

Ans: a)

11) OPL stands for One time Pollution Load

a) True

b) False

Ans : b)

12) List of Board of Director should not be include in Environmental Audit report

a) True

b) False

Ans : b)

13) CCA stands for

a) Cost of Copper per Area

b) Consolidated Consent and Authorization

c) Above both

d) None of the Above

Ans : B

14) ISO 14000 standards are for the _____

a) Quality Management System

b) Environmental Management System

c) Administration

d) Supply chain

Ans : B

15) Which is the first environmental management system standard?

a) BS 7750

b) ISO 9000

c) ISO 9001

d) ISO 9004

Ans : a

16) In which year did the current revision of ISO 14001 get published?

a) 2010

b) 2011

c) 2015

d) 2016

Ans: c

17) Which of the following is for Environment management?

A. ISO-9000

B. ISO-14000

C. ISO-26000

D. ISO-31000

Ans: B

18) ISO - 14001 gives stress on

- A. Plan - Do -check -Act
- B. Environmental protection
- C. Prevention rather than detection
- D. All of the above

Ans: D

19) Total Quality Management (TQM) focuses on

- A. Employee
- B. Customer
- C. Both (a) and (b)
- D. None of the above

Ans: c

20) Water balance diagram must be included in EAR

- a) True
- b) False

Ans: a

21) ISO 14001 registration can improve organization's bottom line through improved environmental performance.

- a) True
- b) False

Ans: a

22) PLI stands for

- a) Public License of India
- b) Public Liabilities Insurance
- c) Above both
- d) None of the above

Ans: b

23) ISO stands for

- a) International Organization for Standardization
- b) International Standard Operation
- c) Above both
- d) None of the above

Ans: a

24) In ETP grit chamber always present.

- a) True
- b) False

Ans: b

25) What are the first steps in ISO 14000 Certification process?

- A) Creating an EMS
- B) Establish a project committee
- C) Prepare a draft environmental policy
- D) All of the above

Answer: D

26) ISO 14001 maps out a framework that a company or organization can follow to set up an effective environmental management system.

- a) True
- b) False

Ans:a

27) ISO 14001 defines criteria for a/an _____.

- a) MMS
- b) VMS
- c) LMS
- d) EMS

Ans: d

28) All standards are periodically reviewed by _____ to ensure they still meet market requirements.

- a) ISO
- b) SOI
- c) OSI
- d) None of the above

Ans: a

29) _____ is the first country in the world to make environmental audits compulsory.

- a) USA
- b) UK
- c) Taiwan
- d) India

Ans: D

30) The concept of *environmental audit* was introduced in *India* in _____ in the *Environment* (Protection) Rules, in the form of Rule 14.

- a) 1991
- b) 1992
- c) 1993
- d) 1994

Ans: b

31) GPCB analysis report for industry must be attached in EAR.

- a) True
- b) False

Ans: a

32) Which is not correctly matched?

- A. ISO -> International Organization for Standardization
- B. EMS -> Environmental Management System
- C. EIA -> Environmental Impact Assessment
- D. WTO -> Whole Trade Output

Ans: D

33) All major project plans should be examined to ensure:

- A. quality of environment
- B. public health and safety
- C. Above both
- D. None of the above

Ans : C

34) An environmental audit helps in achieving the:

- A. resource optimisation
- B. waste minimization
- C. public awareness
- D. All of the above

Ans: D

35) The agency which is not certifying the ISO is:

- A. Bureau of Indian Standards (BIS), Delhi
- B. Quality Assurance Services (QAS)

C. Central Pollution Control Board (CPCB), Delhi
D. All India Institute of Local Self Government, Mumbai
Ans: D

36) The areas up to the 100 meters around the premises such as hospitals, educational institutions and courts are:

- A. Silence Zones
- B. Atrophic Zones
- C. EMP Zones
- D. Irrigation Zones

Ans: A

37) The agency that has laid down the standards for the control of pollution of air, water and noise is:

- A. Central Pollution Control Tribunal
- B. Central pollution Control Agency
- C. Ministry of Home Affairs
- D. Central Pollution Control Board

Ans: D

38) The objective (s) of Environmental Audit is/are

To assess environmental performance

To promote environmental awareness

Above both

None of the above

Ans: c

39) Month wise water consumption report must be added in EAR

True

False

Ans: a

40) Noise measurement report for industry must be added in EAR.

True

False

Ans: a

Unit 4: Characteristic and Analysis Methods for water sample

1. Lake water contains more _____ due to the biological oxidation of the organic matter.

- a) Oxygen
- b) Carbon dioxide
- c) Nitrogen
- d) Carbon monoxide

Answer: b

2. The colour and odour of the natural water is due to the presence of the _____

- a) Dissolved organic matter
- b) Mud
- c) Leaves
- d) Other dust particles

Answer: a

3. Deep well water possess the rotten egg smell due to the dissolved _____

- a) Sulphide
- b) Sulphurous acid
- c) Hydrogen sulphide
- d) Hydrogen peroxide

Answer: c

4. Well water in wells located in the areas of oil and gases will contain _____

- a) Ethane
- b) Methane
- c) Carbon
- d) Nitrogen

Answer: b

5. Surface water appears turbid due to presence of the _____ which remains suspended in the water.

- a) Impurities
- b) Oxygen
- c) Nitrogen
- d) Water plants

Answer: a

6. Which of the following is the suspended impurity?

- a) Iron hydroxide
- b) Dust
- c) Mud
- d) Nitrogen

Answer: a

Explanation: The nitrogen is the dissolved impurity. The suspended impurities are iron hydroxide, silica are the inorganic impurities which decomposes the organic impurities.

7. The suspended impurities is negligible due to the filtering action of _____

- a) Water plants
- b) Dissolved impurities
- c) Soil
- d) Dissolved gases

Answer: c

Explanation: The suspended impurities are negligible due to the filtering action of the soil. The soil filters all the suspended impurities like silica and iron hydroxide.

8. How many types of absorbed impurities in water are there mainly?

- a) 2
- b) 3
- c) 4
- d) 5

Answer: c

Explanation: There are four types of impurities in water are there. They are suspended impurities, dissolved gases, dissolved mineral salts and bacterial impurities.

9. In dissolved mineral salts, _____ gets converted into the bicarbonates by the action of carbondioxide by water.

- a) Carbonate of calcium
- b) Carbonates of magnesium
- c) Carbonates of calcium and magnesium
- d) Neither carbonates of calcium nor magnesium

Answer: c

Explanation: In dissolved mineral salts, the carbonates of calcium and magnesium get converted into the bicarbonates by the action of the carbondioxide by water.

10. _____ water contains more soluble salts than the surface water.

- a) Sea water
- b) Rain water
- c) Underground water
- d) Tank water

Answer: c

Explanation: Sea water and tank water comes under the surface water and the under ground water contains more soluble salts than the surface water.

11. Amino acids comes under _____.

- a) Dissolved impurity
- b) Colloidal impurity
- c) Dissolved gases impurity
- d) Bacterial impurities

Answer: b

Explanation: Amino acids comes under the colloidal impurities. All the gases like nitrogen, oxygen and carbondioxide comes under the dissolved gases.

12. . Chemical composition of the lake water is _____

- a) Constant
- b) Not constant
- c) Some times constant
- d) Cannot be determined

Answer: a

Explanation: Chemical composition of lakes is constant. It has high quantity of organic matter and lesser quantity dissolved minerals

13. The BOD value of the domestic sewage is about _____

- a) 160
- b) 161
- c) 166
- d) 168

[View Answer](#)

Answer: c

Explanation: The BOD value of the domestic sewage is about 166ppm. Total quantity of organic matter utilised is called as the BOD.

14. . Non hazardous organic wastes from the sewage is to be separated from the _____

- a) Toxic industrial wastes
- b) Bacteria
- c) Helminth
- d) Protozoa

[View Answer](#)

Answer: a

Explanation: Non hazardous organic wastes from the sewage is to be separated from the toxic industrial wastes. The entry of the harmful things into water must be prevented.

15. . Domestic water treatment is carried out under _____ conditions.

- a) Aerobic
- b) Anaerobic
- c) Cannot be known
- d) Depends on the pollution level of water

[View Answer](#)

Answer: a

Explanation: Domestic water treatment is carried out in presence of the oxygen. The oxygen is taken from the water. So, it is aerobic process.

16. . The BOD value of the industrial waste must be about _____

- a) 100
- b) 200
- c) 300
- d) 400

[View Answer](#)

Answer: b

Explanation: The BOD value of the industrial waste must be about the 200. The BOD value of the paper industry waste is about 370.

17. The BOD value of the food industry is about _____

- a) 742
- b) 743
- c) 744
- d) 745

[View Answer](#)

Answer: d

Explanation: The BOD value of the food industry is about the 745. This value is higher than that of the normal limits.

18. In domestic water treatment, after the primary treatment _____ is done.

- a) Screening
- b) Sedimentation
- c) Aerobic process
- d) Anaerobic process

[View Answer](#)

Answer: a

Explanation: In domestic water treatment, after the primary treatment of screening is done. Later sedimentation process is done.

19. In the domestic water process, when air is sent during the active sludge, then _____ released.

- a) Oxygen
- b) Carbon dioxide
- c) Nitrogen
- d) Chlorine

[View Answer](#)

Answer: b

Explanation: When the air is sent during the active sludge, then the carbondioxide is released in domestic water process.

20. In final step of the domestic water process, the effluent contain _____ BOD.

- a) 10ppm
- b) 15ppm
- c) 20ppm
- d) 25ppm

[View Answer](#)

Answer: d

Explanation: The effluent obtained in the final step of the domestic water process contains ammonia ion and having the 25ppm.

21. Aerobic process is also called as _____

- a) Activated sludge process
- b) Sludge thickening process
- c) Sedimentation
- d) Screening

[View Answer](#)

Answer: a

Explanation: Aerobic process is also called as the activated sludge process. The sludge thickening, sedimentation and screening are the steps involved in the domestic water treatment.

22. By aerobic process _____ of biodegradable water is converted into the biomass.

- a) 10%
- b) 30%
- c) 50%
- d) 75%

[View Answer](#)

Answer: c

Explanation: By aerobic process the 50% of the biodegradable water is converted into the biomass and the remaining 50% into carbondioxide.

23. In anaerobic treatment the organic acid and alcohol is undergone into _____ process.

- a) Sedimentation
- b) Screening
- c) Catalysis
- d) Fermentation

[View Answer](#)

Answer: d

Explanation: In anaerobic treatment the organic acid and alcohol is undergone into fermentation at 35°C and the ppm of 5 to 6.

24. In biological oxidation process, depending on the organic load, the oxidation takes place

- _____
- a) 1-4Hours
 - b) 4-8Hours

- c) 8-16Hours
 - d) 16-20Hours
- [View Answer](#)

Answer: b

Explanation: In biological oxidation process, depending on the organic load, the oxidation process takes place up to 4 to 8 hours. Organic impurities are reduced by the biological oxidation process by micro organisms.

25. All impurities are oxidised into the _____ and _____ in the biological oxidation process.
- a) Oxygen and water
 - b) Carbon dioxide and water
 - c) Nitrogen and water
 - d) Chlorine an water
- [View Answer](#)

Answer: b

Explanation: All impurities are oxidised into the carbondioxide and water in the biological oxidation process. The sludge formed in this process will be settled down quickly and gives clear supernatant.

26. The water after removing of sludge in the biological oxidation process is treated with _____
- a) Chlorine
 - b) Bromine
 - c) Fluorine
 - d) Iodine
- [View Answer](#)

Answer: a

Explanation: The water after removing of sludge in the biological oxidation process is treated with the chlorine or bleaching powder to make it more safe and let it into surface water.

27. Trickling filter method is _____ than the activated sludge process.
- a) Fast
 - b) Slow
 - c) Very fast
 - d) Moderate
- [View Answer](#)

Answer: b

Explanation: Trickling filter method is slow process than that of the activated sludge process. This process is convenient and cheaper process than the activated sludge process.

28. The depth of the rectangular circular tanks in the trickling filters method is having the depth of _____
- a) 4m
 - b) 3m
 - c) 2m
 - d) 1m
- [View Answer](#)

Answer: c

Explanation: The depth of the rectangular circular tanks in the trickling filters method is having the depth of the 2 metres packed with broken stone pieces or coal etc.

29. Periodic cleaning is used to _____

- a) Increase efficiency
- b) Decrease efficiency
- c) Increase pressure
- d) Decrease dissolved oxygen

[View Answer](#)

Answer: a

Explanation: Periodic cleaning is necessary to remove excess sludge in the water. So, it is useful to increase the efficiency of the process.

30. In the trickling filter process, the _____ build up and they block the passage.

- a) Sludge formed
- b) Dissolved impurities
- c) Dissolved solids
- d) Micro organisms

[View Answer](#)

Answer: d

Explanation: The micro organism built up and they block the passage and then the rate of flow drops considerably.

31. Dried sludge can be used as _____

- a) Fertilizer
- b) Pesticide
- c) Reagent
- d) Medicine

[View Answer](#)

Answer: a

Explanation: Dried sludge can be used as the fertilizer. It is one of the main advantages. The sludge is de watered by the filtration in sand beds.

32. The unpleasant odour of the water is due to presence of the _____

- a) Nitrogen
- b) Bismuth
- c) Phenols
- d) Dissolved oxygen

[View Answer](#)

Answer: c

Explanation: The unpleasant odour of the water is due to the presence of the phenols, hydrogen sulphides, chlorine and organic sulphur compounds.

33. _____ imparts peculiar odour to the water.

- a) Decaying organic matter
- b) Detergents
- c) Phenols

d) Dissolved oxygen

[View Answer](#)

Answer: b

Explanation: The bad odour of water is due to the phenols, decaying organic matter and phenols.

The peculiar odour is due to the detergents and pesticides.

34. Reacting the water with _____ removes the odour due to the phenols.

a) KMnO_4

b) MnO_4

c) Potassium

d) Magnesium

[View Answer](#)

Answer: a

Explanation: The chlorination of water and the reacting the water with the potassium permanganate removes the odour of water due to phenols.

35. The treatment of water with _____ improves the taste of water.

a) Oxygen

b) Chlorine

c) KMnO_4

d) Ozone

[View Answer](#)

Answer: d

Explanation: The treatment of water with the ozone improves the taste of the water and the bed of activated carbon removes the colour.

36. How many methods of removing the radio active impurities are there?

a) 2

b) 3

c) 3

d) 4

[View Answer](#)

Answer: a

Explanation: There are two types of methods. They are: By absorbing the radio active elements by using suitable absorbent. Allowing of such periods at which it separates from water.

37. Which of the following is the physical monitoring of the lake?

a) pH

b) COD

c) BOD

d) Turbidity

[View Answer](#)

Answer: d

Explanation: The turbidity of the water comes under the physical monitoring of the lake.

Temperature, colour and solid also comes under the physical monitoring.

38. Conductivity comes under the _____ monitoring of the lake.

- a) Physical
- b) Chemical
- c) Biological
- d) Organic

[View Answer](#)

Answer: a

Explanation: The physical monitoring of lake includes the conductivity of the water. It also includes turbidity, colour and temperature of water.

39. _____ comes under the chemical monitoring of the lake.

- a) Detergents
- b) Pathogens
- c) Conductivity
- d) Turbidity

[View Answer](#)

Answer: a

Explanation: The detergents comes under the chemical monitoring of the lake. Pathogens comes under the biological and the conductivity and turbidity comes under the physical monitoring of the lake.

40. Pollution enters into the water system in _____ ways.

- a) 1
- b) 2
- c) 3
- d) 4

[View Answer](#)

Answer: d

Explanation: Pollution enters into the water system in four ways.

Run off, river flow transport, direct discharge of domestic and industrial waste and water sediment interface causes the pollution.

41. A large amount of soil can move with the run off called _____

- a) Soil erosion
- b) Soil conservation
- c) Soil pollution
- d) Soil moving

[View Answer](#)

Answer: a

Explanation: A large amount of soil can move with the run off called as soil erosion. When the rain fall occurs, with the water, the top layer of the soil also moves.

42. What is the full form of GAP?

- a) Ganga action pre distribution
- b) Ganga action plan
- c) Ganga affected plan

d) Ganga affected pre distribution

[View Answer](#)

Answer: b

Explanation: GAP stands for the Ganga action plan which is proposed by the central pollution control board for monitoring the water bodies.

43. The central pollution control board and the department of ocean and environment has established _____ stations over the entire coastal line of the country.

a) 171

b) 172

c) 173

d) 174

[View Answer](#)

Answer: d

Explanation: The central pollution control board and the department of ocean and environment has established 174 stations over the entire coastal line of the country.

44. Coastal water shows major differences in _____

a) Pollution

b) Sewage

c) Salinity

d) Conductivity

[View Answer](#)

Answer: c

Explanation: Coastal water shows major differences in salinity. The salinity of the sea water is higher than that of the rivers and lakes.

45. Monitoring systems can be carried out by using _____

a) Motors

b) Automatic sensors

c) Automatic motors

d) Turbines

[View Answer](#)

Answer: b

Explanation: By using the automatic sensors, the monitoring systems becomes more easier. Turbines are used to generate electricity.

46. . Mostly pollution of rivers takes place by discharge sewage.

a) True

b) False

[View Answer](#)

Answer: a

Explanation: Mostly, the pollution of the river takes place by discharge of sewage in water or by releasing the industrial wastes into the rivers.

47. Control of river pollution can be done by providing the extra _____ during dry season.

- a) Water
- b) Nitrogen
- c) Carbondioxide
- d) Oxygen

[View Answer](#)

Answer: d

Explanation: By providing the oxygen to the water in dry season will reduce the pollution of the rivers.

48. . Determination of flow increase is used for the monitoring of _____

- a) sea pollution
- b) River pollution
- c) Lake pollution
- d) Tank pollution

[View Answer](#)

Answer: b

Explanation: Determination of the flow increase or stream treatment timing are used to monitor the river water pollution.

49. . which of the following does not include in the monitoring of river pollution?

- a) Assessing the immediate water quality
- b) Development activities in the region
- c) Determination of flow increase
- d) Colour of the water

[View Answer](#)

Answer: d

Explanation: Colour of the water is the monitoring of the lake water and for monitoring the river water, we need to assess the quality of water, development activities must be done and water flow increase must be determined

50. COD values are always _____ BOD.

- a) Less than
- b) Higher than
- c) Equal
- d) Nearly equal

[View Answer](#)

Answer: b

Explanation: COD values are always greater than that of the BOD values because the organic and the biologically oxidisable materials are oxidised in COD.

51. COD can be determined in _____

- a) 1Hours
- b) 2Hours
- c) 3Hours
- d) 4Hours

[View Answer](#)

Answer: c

Explanation: COD can be determined in 3 hours. The organic matter of sample is oxidised to the carbondioxide, ammonia and water.

52. . Increase in the BOD value of the water indicates _____

- a) Decrease in pollution
- b) Increase in pollution
- c) Pollution is independent of BOD
- d) None of the above

[View Answer](#)

Answer: b

Explanation: Increase in the value of the BOD in water indicates the increase in the water pollution.

53. The organic matter have the limit in water that is about _____

- a) 0.2 to 1
- b) 0.5 to 1
- c) 1 to 2
- d) 2 to 4

[View Answer](#)

Answer: a

Explanation: The organic matter has the desired limit in water about 0.2 to 1 ppm. Increase in the value indicates the pollution.

54. . In sewage the waste is about _____

- a) 0.01
- b) 0.02
- c) 0.03
- d) 0.05

[View Answer](#)

Answer: d

Explanation: Sewage contains 99.95% of water and 0.05% of the organic and municipal wastes. Strength of sewage is expressed in terms of BOD.

55. Hardness in water is expressed in terms of _____ equivalents.

- a) Calcium carbonate
- b) Calcium bicarbonate
- c) Magnesium hydroxide
- d) Magnesium oxide

[View Answer](#)

Answer: a

Explanation: Hardness of the water is expressed in terms of the calcium carbonate equivalents. They are like ppm, degree Clark and French unit.

56. 1 degree Clark is equal to _____ ppm.

- a) 12.3
- b) 13.3
- c) 14.3

d) 15.3

[View Answer](#)

Answer: c

Explanation: One degree Clark is equal to the 14.3 ppm. Ppm means parts per million. 1ppm is equal to 1mg/litre.

57. One French unit is equal to _____ ppm.

a) 10

b) 20

c) 30

d) 40

[View Answer](#)

Answer: a

Explanation: One French unit is equal to the 10ppm. Hardness causing salt as the number of parts of the substance by weight in million parts by weight of water is ppm.

58. The ppm is one part of calcium carbonate equivalent hardness is present in _____ of water.

a) One

b) One million

c) One billion

d) One trillion

[View Answer](#)

Answer: b

Explanation: The ppm is one part of calcium carbonate equivalent hardness is present in the one million parts of water.

59. One French unit is equal to _____ mg/litre.

a) 5

b) 10

c) 15

d) 20

[View Answer](#)

Answer: b

Explanation: One French unit is equal to the 10mg/litre. One French unit is equal to 10ppm and 0.7 degree Clark.

60. 50 ml of standard and hard water containing 1mg of pure CaCO_3 per ml consumed 10ml of EDTA solution. 50ml of given EDTA sample requires 10ml of same EDTA solution. Calculate the total hardness of water sample in ppm.

a) 10ppm

b) 100ppm

c) 1000ppm

d) 10000ppm

[View Answer](#)

Answer: c

Explanation: 50ml of standard hard water requires 10ml of EDTA solution so 1ml of standard water

requires 5ml of EDTA solution. So, 50ml of water sample requires 10ml of EDTA solution. So, 50ml of water sample requires 50mg of CaCO_3 . So, 1000ml of water sample requires $50 \times (1000/50) = 1000$ mg of CaCO_3 that is 1000ppm.

61. In determination of hardness by EDTA method, 50ml of standard hard water required 30ml of EDTA solution while 50ml of sample hard water consumed 20ml of EDTA solution. After boiling 50ml of same sample required 10ml of EDTA solution. Calculate the permanent hardness.

- a) 322ppm
- b) 332ppm
- c) 664ppm
- d) 644ppm

[View Answer](#)

Answer: b

Explanation: For 50ml of boiled water requires the 10ml of EDTA solution that is $10 \times (50/30)$ mg of CaCO_3 . The 1000ml of the boiled water requires the $10 \times (50/30) \times 20 = 322$ mg of CaCO_3 . It means permanent hardness is 322ppm.

62. We know that lime required for softening of water is $x \{ \text{temp Ca hardness} + 2. \text{Mg hardness} + \text{perm}(\text{Mg} + \text{Fe} + 3\text{Al}) \text{hardness} + 1/2 \text{HCL} + \text{H}_2\text{SO}_4 - \text{NaAlO}_2 - \text{CO}_2 \}$ -all are in terms of mg of CaCO_3 . Here $x = ?$

- a) 7.4
- b) 0.74
- c) 74
- d) 740

[View Answer](#)

Answer: b

Explanation: Lime also reacts with bicarbonates of Na and K to form carbonate. Since 100 parts of CaCO_3 is equivalent to the 74 parts of $\text{Ca}(\text{OH})_2$. so, $x = 74/100 = 0.74$.

63. 100 parts of CaCO_3 is equivalent to the _____ parts of sodium carbonate.

- a) 103
- b) 104
- c) 105
- d) 106

[View Answer](#)

Answer: d

Explanation: 100 parts of CaCO_3 is equivalent to the 106 parts of the sodium carbonate. So, the washing soda requirement is $100/106 \{ \text{temp Ca hardness} + 2. \text{Mg hardness} + \text{perm}(\text{Mg} + \text{Fe} + 3\text{Al}) \text{hardness} + 1/2 \text{HCL} + \text{H}_2\text{SO}_4 - \text{NaAlO}_2 - \text{CO}_2 \}$.

64. The chemical oxygen demand can be given as _____

- a) $\{[(V_1 - V_2) \times N \times 8]\} / x$
- b) $\{[(V_1 + V_2) \times N \times 8]\} / x$
- c) $\{[(V_2 - V_1) \times N \times 8]\} / x$
- d) $\{[(V_1 / V_2) \times N \times 8]\} / x$

[View Answer](#)

Answer: a

Explanation: The chemical oxygen demand can be given by $\frac{[(V_1 - V_2) \cdot N \cdot 8]}{x}$ where V_1 =volume of ferrous ammonium sulphate required for blank, V_2 =volume of ferrous ammonium sulphate required for test, N =normality of ferrous ammonium sulphate, x =volume of sewage sample taken.

65. The biochemical oxygen demand can be given by _____

- a) $(D_{ob} - D_{os}) + \text{dilution factor}$
- b) $(D_{ob} - D_{os}) - \text{dilution factor}$
- c) $(D_{ob} - D_{os}) / \text{dilution factor}$
- d) $(D_{ob} - D_{os}) \cdot \text{dilution factor}$

[View Answer](#)

Answer: d

Explanation: The biochemical oxygen demand can be given by $(D_{ob} - D_{os}) \cdot \text{dilution factor}$ where D_{ob} = dissolved oxygen present in blank D_{os} = dissolved oxygen of sewage after incubation.

66. If a sample water has not supplied any heat and having impurities as follows: $\text{Mg}(\text{HCO}_3)_2 = 50$ mg of CaCO_3 , $\text{MgSO}_4 = 100$ mg of CaCO_3 , $\text{CaCl}_2 = 200$ mg of CaCO_3 , $\text{Ca}(\text{NO}_3)_2 = 100$ mg of CaCO_3 . Calculate the lime required for treatment of 10000 litres of water.

- a) 1.82Kg
- b) 1.50Kg
- c) 1.45Kg
- d) 1.48Kg

[View Answer](#)

Answer: d

Explanation: Lime needed is $0.74[\text{temp Ca hardness} + \text{temp of Mg hardness} + \text{perm Mg hardness}]$. So, $0.74(0 + 2 \cdot 50 + 100) = 148$ mg/litre. Lime requirement for 10000 litres of water is $148 \cdot 10000 \text{ mg} = 1.48 \text{ Kg}$.

67. . What is the process by which Total dissolved solids are removed?

- a) Reverse Osmosis
- b) Ultrafiltration
- c) Adsorption
- d) Clarification

[View Answer](#)

Answer: a

Explanation: The total dissolved solids are removed by reverse osmosis. Water passing through a semi permeable membrane is subjected to pressure greater than osmotic pressure. In this process, the ions are removed.

68. . What is the limit of total dissolved solids in treated water which is to be used for the gardening purpose?

- a) 1200 mg/L
- b) 1100 mg/L
- c) 1000 mg/L
- d) 500 mg/L

[View Answer](#)

Answer: a

Explanation: The limit of total dissolved solids in treated water is 1200 mg/L. This holds good for surface water. According to the applications, the limit of total dissolved solids is fixed.

69) _____ is the amount of oxygen required to oxidize only organic matter in sewage.

- a) Turbidity
- b) BOD
- c) COD
- d) DO

70) The full form of BOD is _____

- a) Biodegradable oxygen demand
- b) Biological oxygen demand
- c) Biochemical oxygen demand
- d) Bandwidth on demand

71) The biochemical oxygen demand is computed by _____

- a) Dissolved oxygen / Dilution factor
- b) Dissolved oxygen + Dilution factor
- c) Dissolved oxygen – Dilution factor
- d) Dissolved oxygen * Dilution factor

72) _____ is the amount of oxygen required to oxidize both organic and inorganic matter in sewage.

- a) Turbidity
- b) BOD
- c) COD
- d) DO

73) COD is abbreviated as _____

- a) Chemical oxygen demand
- b) Complex oxygen demand
- c) Customary oxygen demand
- d) Chemical oxygen deficit

74) The oxidizing agent used in COD test is _____

- a) Potassium chloride
- b) Potassium per-manganate
- c) Potassium chromate
- d) Potassium dichromate

75) Methane is formed due to the reduction of _____

- a) Nitrates
- b) Sulfates

- c) Carbon dioxide
- d) Organic acids

76) Range of pH scale is

- a. 7 to 10
- b. 0 to 10
- c. 0 to 14
- d. 7 to 14

Answer: (c)

77) pH of neutral salt is

- a. 7
- b. <7
- c. >7
- d. 0

Answer: (a)

78) Which of the following indicator is pink in basic medium?

- a) Methyl orange
- b) Phenolphthalein
- c) Starch
- d) Litmus paper

79) What is the disadvantage of using high alkaline water?

- a) It may lead to infections
- b) It may lead to electrolysis
- c) It may lead to caustic embrittlement
- d) It may lead to indigestion

80) Alkalinity is a measure of the ability of water to neutralize the acids.

- a) True
- b) False

81) Total Suspended Solid for waste water is carried out at the temperature of 184⁰C.

True

False

82) Total dissolved solid for waste is carried out at the temperature of 105⁰C.

True

False

83) Hot air oven is required in Alkalinity experiment.

True

False

84) At 27 °C BOD experiment is done in _____ Days.

2

3

4

5

85) Total solids in a wastewater consist of insoluble solids alone.

a) True

b) False

86) Identify the correct relation between the following?

a) Dissolved solid = Total solid + Suspended solid

b) Dissolved solid = Total solid – Suspended solid

c) Total solid = Dissolved solid / Suspended solid

d) Dissolved solid = Suspended solid – Total solid

87) The permissible limit of turbidity of domestic water is ____ ppm.

a) 5-10

b) 1-5

c) 10-50

d) 10-30

88) What is the full form of NTU in context with turbidity?

a) Number of transfer unit

b) Neurological turbidity unit

c) Nephelometric turbidity unit

d) Network terminal unit

89) What is the indicator used in EDTA method?

a) Potassium chromate

b) Potassium dichromate

c) Potassium chloride

d) Erio chrome black T

90) Which of the following process is used to remove the colloidal particles from water?

a) Chemical precipitation

b) Chemical coagulation

- c) Ion exchange
- d) Adsorption

91) Starch indicator is used in COD experiment.

True

False

92) Ferroin indicator is used in BOD experiment.

True

False

93) Oil and grease is the presence of inorganics in wastewater.

- a) True
- b) False

94) CPCB stands for -

- a) Control pollution control board
- b) Central pollution central board
- c) Control pollution central board
- d) Central pollution control board

95) In COD Experiment the temperature of Digester is set to be _____ °C.

- a) 70
- b) 105
- c) 150
- d) 200

96) Manganese Sulphate reagent is used in _____ Experiment.

- a) COD
- b) pH
- c) TOC
- d) DO

97) Pt-Co is the unit for the measurement of Colour of water.

- a) True
- b) False

98) Acid convert red litmus paper in to blue litmus paper.

- a) True
- b) False

99) Sulfuric acid is known as Strong acid.

- a) True

b) False

Unit 5: Waste water treatment

1) What is the most common used coagulant for water treatment?

- a) Alum
- b) Ferric sulphate
- c) Limestone
- d) Coal+++

2) Which of these remove coarse materials?

- a) Coarse screen
- b) Grit chamber
- c) Fine screen
- d) Commutors

3) Which of these is used to remove odour?

- a) Ultrafiltration
- b) Pressure sand filter
- c) Activated carbon
- d) Nano filter

4) Reverse Osmosis is which type of treatment?

- a) Primary treatment
- b) Tertiary treatment
- c) Secondary treatment
- d) None of the above

5) Primary sludge includes _____.

- a) Total suspended solids
- b) Suspended solids
- c) Removable solids
- d) Settleable solids

6) Which of the following methods are used in rural communities?

- a) Aerobic digestion
- b) Mechanical dewatering
- c) Dewatering
- d) Composting

7) How does the activated sludge appear?

- a) Gray
- b) Red
- c) Brown and flocculant like appearance
- d) Greasy

8) What is the opening of fine screens?

- a) 0.5 inch
- b) 1 inch

- c) 0.25 inch
- d) 0.15 inch

9) Screening is the first unit operation in wastewater treatment plant.

- a) True
- b) False

10) A grit chamber is usually installed _____ primary sedimentation tanks.

- a) Before
- b) After
- c) In between
- d) bottom of

11) Grit chamber is constructed to protect the further mechanical equipment of the water treatment plant.

- a) True
- b) False

12) What is the cleaning period for manual grit chambers?

- a) 3 days
- b) 5 days
- c) 48 hours
- d) 1 week

13) Settling tank is also called as sedimentation tank.

- a) True
- b) False

14) Which is the primary force acting on the Settleable particles?

- a) Gravitational force
- b) Centrifugal force
- c) Mechanical force
- d) Radial force

15) Sedimentation is a process using gravity to remove suspended solids from water.

- a) True
- b) False

16) What is the accumulated layer at the bottom of the tank called as?

- a) Flocs
- b) Sediment
- c) Sludge
- d) Sewage

17) Sludge is disposed through _____

- a) Hopper bottom
- b) Sludge pump

- c) Deflector
- d) Launder

18) What is the first step in clarification?

- a) Sedimentation
- b) Coagulation
- c) Flocculation
- d) Screening

19) Out of these which is not used as a chemical coagulant?

- a) Alum
- b) Calcium chloride
- c) Ferric Chloride
- d) Poly Iron Chloride

20) The clustered particles formed in the presence of a flocculant are called _____

- a) Colloid
- b) Flocs
- c) Ion
- d) Polymer

21) What is the chemical formula of aluminium sulphate?

- a) $\text{Al}_2(\text{SO}_4)_3$
- b) $\text{Al}(\text{SO}_4)_3$
- c) $\text{Al}_2(\text{SO}_4)$
- d) $\text{Al}(\text{SO}_4)$

22) 1 micrometer = _____

- a) 10^{-2} m
- b) 10^{-3} m
- c) 10^{-6} m
- d) 10^{-9} m

23) What is the test used to select the type of coagulant required/

- a) Bar test
- b) Jar test
- c) Stock test
- d) Coagulant test

24) Trickling filter can also be called as a biofilter.

- a) True
- b) False

25) _____ in trickling filter contains many species like bacteria and round worms.

- a) Treated water
- b) Wastewater
- c) Biofilm
- d) Air influent

26) Which of the following is not used as a media for trickling filters?

- a) Sand

- b) Geotextiles
- c) Gravel
- d) Paper

27) Which of the following causes thickening of the biofilm?

- a) Reduction of intake wastewater
- b) Rapid growth of organisms
- c) Reduction in air supply
- d) Increase in acidity

28) What is the shape of a typical trickling filter?

- a) Circular
- b) Cylindrical
- c) Square
- d) Rectangular

29) As the compression increases, the porosity in filter bed _____

- a) Increases
- b) Decreases
- c) Remains constant
- d) None of the above

30) What does MLSS stand for?

- a) Mixed Liquor Soluble Solvents
- b) Mixed Liquor Suspended solids
- c) Mixed Liquor Suspended Solvents
- d) Major Liquid Soluble Solids

31) Activated sludge process uses micro-organisms to degrade organics from wastewater.

- a) True
- b) False

32) Activated sludge process can be used for treating all types of wastewater.

- a) True
- b) False

33) What does SBR stand for?

- a) Secondary batch reactor
- b) Sequential biological reactor
- c) Secondary biological reactor
- d) Sequential batch reactor

34) The Activated Sludge Process is a _____ wastewater treatment process.

- a) Physical
- b) Chemical
- c) Biological
- d) Biochemical

35) Which of the following methods is used in both dewatering and thickening?

- a) Filter press
- b) Centrifuge

- c) Gravity belt
- d) Rotary drum

36) Biological process is used to remove _____ from water

- a) Settleable solids
- b) Volatile solids
- c) Dissolved solids
- d) Colloids

37) What is the wastewater called as after physical and biological removal of solids?

- a) Primary effluent
- b) Primary treated water
- c) Secondary treated water
- d) Secondary treated wastewater

38) The secondary clarifiers are _____

- a) Circular
- b) Rectangular
- c) Square
- d) Triangular

39) The surface area of facultative ponds should be small.

- a) True
- b) False

40) Sludge treatment aims at reducing sludge weight and volume.

- a) True
- b) False

41) Sludge is composed of liquid components alone.

- a) True
- b) False

42) Which of these is not a method of digestion?

- a) Composting
- b) Aerobic digestion
- c) Evaporation
- d) Anaerobic digestion

43) Anaerobic digestion is carried out in _____

- a) Presence of oxygen
- b) Presence of carbon-dioxide
- c) Absence of oxygen
- d) Absence of carbon-dioxide

44) Anaerobic digestion can be used to produce fuel.

- a) True
- b) False

45) _____ is used for ultrafiltration.

- a) Permeable membrane

- b) Highly permeable membrane
- c) Semi-permeable membrane
- d) Non-permeable membrane

46) Which of the following factor is considered in ultrafiltration?

- a) Size
- b) Colour
- c) Taste
- d) Smell

47) Which of the following is a tertiary treatment?

- a) Coagulation
- b) Sand filtration
- c) Flocculation
- d) Sedimentation

48) Which of the following is not correct with respect to ultrafiltration?

- a) Chemicals required
- b) Compact plant size
- c) Good product quality
- d) Good pathogen removal

49) Filtration is based on colour of particles.

- a) True
- b) False

50) Chemical adsorption is also called as _____

- a) Sorption
- b) Chemisorption
- c) Chemiption
- d) Chemical sorption

51) Physical adsorption is also called as _____

- a) Adsorption
- b) Absorption
- c) Physisorption
- d) Sorption

52) Osmosis is a process where a stronger saline solution will tend to migrate to a weaker saline solution.

- a) True
- b) False

53) _____ is used for the RO process.

- a) Highly permeable membrane
- b) Permeable membrane
- c) Semi-permeable membrane
- d) Non-permeable membrane

54) Ion exchange unit is known as _____

- a) Water hardener

- b) Water softener
- c) Water purifier
- d) Exchanger

55) What is the preferred regenerant in case of cation exchanger?

- a) HCl
- b) H_2SO_4
- c) H_2CO_3
- d) HF

56) What is the preferred regenerant in case of anion exchanger?

- a) NaCl
- b) NaOH
- c) Na_2SO_4
- d) Na_2CO_3

57) Ammonium Sulphate is also one type of Coagulant.

True

False

58) Initial cost of Trickling filter is very high.

True

False

59) Gelatinous precipitates produced by adding coagulant in waste water is known as Floc.

True

False

Unit 6: Solid Waste Management

1. How many major sources of solid waste are there based on their origin?

- a) 10
- b) 5
- c) 9
- d) 6

2. Source(s) of solid waste include

- a) residential,
- b) industrial,
- c) Commercial
- d) All of above

3. Source(s) of solid waste include

- a) construction & demolition areas
- b) municipal services
- c) agriculture and biomedical
- d) all of above

4. Which of the below is not an idea behind solid waste management?

- a) Control of waste generation
- b) Storage and collection
- c) Disposal
- d) Stop waste generation

5. Which is functional components of solid waste management

- a) identification of waste
- b) onsite handling & storage
- c) waste collection
- d) all of above

6. Which is functional components of solid waste management

- a) waste transfer
- b) waste processing
- c) disposal
- d) all of above

7. The term ISWM refers to:

- a) International Solid Waste Management
- b) Integrated Solid Waste Management
- c) Integrated Solid Waste Machine
- d) International Solid Waste Mechanism

[View Answer](#)

8. ISWM refers to the selection and use of appropriate techniques for the disposal of solid waste.

True

False

9. Under which rules of Government, guidelines for solid waste management are followed today?

- a) Municipal Solid Waste Rules, 2000
- b) Municipal Solid Waste Rules, 2016
- c) Solid Waste Rules, 2000

d) Solid Waste Rules, 2016

View Answer

10. The average composition of Municipal solid waste is:

- a) 41% organic, 40% inert & 19% recyclable
- b) 20% organic, 60% inert & 20% recyclable
- c) 30% organic, 20% inert & 50% recyclable
- d) 19% organic, 41% inert & 40% recyclable

11. There are _____ ways to treat waste thermally.

- a) 5
- b) 3
- c) 2
- d) 6

12. Thermally solid waste treatment include

- a) Incineration
- b) Recycling
- c) Landfill
- d) None of above

13. Thermal solid waste treatment include

- a) pyrolysis
- b) incineration
- c) Both of above
- d) None of above

14. Open Burning is the thermal solid waste treatment method

True

False

15. How many types of landfills are there?

- a) 3
- b) 2
- c) 5
- d) 4

16. types of landfills include

- a) Sanitary landfills,
- b) Controlled dumps
- c) Bioreactor landfills
- d) All of above

17. Bio-medical waste can be effectively managed by the thermal process.

- a) True
- b) False

- .
18. The WHO has classified the bio-medical waste into _____ categories.
- a) 5
 - b) 4
 - c) 3
 - d) 2
19. Which gas produced in open dumps from the decomposition of biodegradable waste?
- a) Ethane
 - b) Methane
 - c) Propene
 - d) Ethene
20. Which is the first city to an established system of waste removal?
- a) Lahore
 - b) Athens
 - c) Paris
 - d) London
21. Why burning waste is not an acceptable practice of solid waste management?
- a) Because it is very costly
 - b) Because it requires modern technologies
 - c) Because it cause several environmental issues
 - d) Because it requires lot of space
22. What plan should we make to the disposal of solid waste?
- a) Integrated waste management plan
 - b) Recycling of waste management plan
 - c) Reducing of waste management plan
 - d) Use of waste management plan
23. The term 'Municipal Solid Waste' is used to describe which kind of solid waste?
- a) Hazardous
 - b) Toxic
 - c) Non hazardous
 - d) Non toxic
24. How many main components are there in integrated waste management?
- a) One
 - b) Two
 - c) Three
 - d) Four
25. An integrated waste management strategy includes
- a) source reduction
 - b) recycling
 - c) disposal
 - d) all of above

26. Municipal Solid Waste (MSW) contains a wide variety of materials.
- a) True
 - b) False
27. Which of the integrated waste management is reduced on an individual level?
- a) Source reduction
 - b) Recycling
 - c) Disposal
 - d) Burning
28. Which of the following can be recycled many times?
- a) Plastic
 - b) Wood
 - c) Organic materials
 - d) Aluminum
29. Why plastic is difficult to recycle?
- a) Because it is very hard material
 - b) Because it is very adhesive in its nature
 - c) Because of different types of polymer resins
 - d) Because of different sizes of plastic
30. How many key characteristics of a municipal sanitary landfill are there?
- a) One
 - b) Two
 - c) Three
 - d) Four
31. How does organic material in the buried solid waste will decompose?
- a) By the action of oxidation
 - b) By the action of microorganisms
 - c) By the flow of water
 - d) By the soil particles
32. What is called for the process of burning municipal solid waste in a properly designed furnace under suitable temperature and operating conditions?
- a) Landfill
 - b) Recycling
 - c) Vermicomposting
 - d) Incineration
33. Why the recycled paper is banned for use in food containers?
- a) Because it creates contamination
 - b) Because it creates a lot of spaces
 - c) Because paper can be used only one time
 - d) Because paper is very thick
34. Land filling is an economic alternative for solid waste disposal and it can be implemented easily.
- a) True
 - b) False

35. _____ treatment method prevent immobilization of hazardous waste into environment.
- a) Hydrolysis
 - b) Neutralisation
 - c) Chemical precipitation
 - d) Stabilisation and solidification
36. Which treatment is better suitable for remediation of contaminated hazardous waste site?
- a) Hydrolysis
 - b) Neutralisation
 - c) Chemical precipitation
 - d) Stabilisation and solidification
37. In stabilisation and solidification treatment _____ is mixed with contaminated media.
- a) Binding reagent
 - b) Neutralisation agent
 - c) Acidic agent
 - d) Basic agent
38. Solidification refers to changes in the _____ properties of hazardous waste.
- a) Physical
 - b) Chemical
 - c) Biological
 - d) Physico-chemical
39. Stabilisation refers to changes in the _____ properties of hazardous waste.
- a) Physical
 - b) Chemical
 - c) Biological
 - d) Physico-chemical
40. Cement kiln dust can be used as binding reagent.
- a) True
 - b) False
41. Stabilisation and solidification treatment can be applied for liquid waste.
- a) True
 - b) False
42. The end product resulting from solidification process is _____
- a) Liquid waste
 - b) Silt
 - c) Waste block
 - d) Organics
43. _____ process encapsulates contaminants in polyethylene.
- a) PERM
 - b) DERM

- c) TERM
 - d) POPA
44. Thermal treatment technologies are differentiated by _____
- a) Type of grate
 - b) Chemicals
 - c) Energy
 - d) Temperature
45. _____ from combustion of waste reduces cost.
- a) Chemical analysis
 - b) Metals
 - c) Material recovery
 - d) LCA
46. _____ emission is cited as an issue from incineration?
- a) Carbon
 - b) Dioxin
 - c) Sulphur
 - d) Nitrogen
47. Thermal processing reduces hazard from waste.
- a) True
 - b) False
48. _____ % of waste by weight remains after combustion.
- a) 20-35
 - b) 20-40
 - c) 40-50
 - d) 30-50
49. Ferrous materials are combustible.
- a) True
 - b) False
50. Residence time of waste in combustion zone is _____ seconds.
- a) 1
 - b) 2
 - c) 3
 - d) 4
51. _____ of hazardous waste plays a major role in designing combustion unit.
- a) Calorific value
 - b) Chemical value
 - c) Energy value
 - d) Fuel value
52. Which of the following waste characteristic is considered for combustion?
- a) Flash point
 - b) Energy point
 - c) Burning point
 - d) Melting point

53. Mechanical mixing of waste ensures _____

- a) Flash point
- b) Even distribution
- c) Hydrocarbon mixing
- d) Less water requirement

54. Which of the following are the solid residues from incineration?

- a) Slag, fly ash, APC
- b) Klink, ash, BPC
- c) Gas, slag, APC
- d) Liquids, ash, slag

55. . What is the emission limit for dioxins as per European Union?

- a) 0.1
- b) 0.2
- c) 0.3
- d) 0.4

56. Solid Waste is unwanted or useless materials.

True

False

57. Open dumps refer to uncovered areas that are used to dump solid waste of all kinds.

True

False

58. The contamination of groundwater and soil through landfill is known as _____.

- a) Leachate
- b) Sludge
- c) Ash
- d) None of the above

59. Community bin is the part of primary collection system of Solid waste Management.

True

False

60. Bagasse is

- a) A variety of coal
- b) A fuel consisting of wood etc
- c) Fibrous portion of sugarcane left after extracting the juice
- d) A kind of rice straw

61. Recycling reduces

- (A) energy usage
- (B) air pollution

- (C) water pollution
- (D) all of the above

62. Following material has highest recycle quality

- (A) paper
- (B) plastic
- (C) steel
- (D) oil

63. Which of the following ones is the simplest and most common method used in the cities to dump the waste that are collected ?

- a) River
- b) Ocean
- c) Landfill
- d) None of the above

64. Identify the correct one from the given list about wastes ?

- a) There is no real waste in nature
- b) The apparent wastes collected from one process becomes the input to another
- c) All processes of consumption and production produce waste
- d) All of the above

65. _____ is the separation of biodegradable waste from non biodegradable waste for proper disposal and recycling.

- a) Separation
- b) Segregation
- c) Removal
- d) Composting

66. Methane gas is released due to _____

- a) Proper segregation
- b) Improper segregation
- c) Disposal
- d) Dumping

67. Garbage is a liquid waste.

- a) True
- b) False

68. _____ consists of wastes originating from various food facilities.

- a) Compost
- b) Manure
- c) Rubbish
- d) Garbage

69. Proper segregation can lead to mixing in landfills.

- a) True
- b) False