Uka Tarsadia University (Diwaliba Polytechnic)
Diploma in Environmental Engineering
Objective Type Questions (Physico Chemical Treatment of Water and Wastewater- EV2002)

Unit 1

1) _____ is that water which is not chemically pure, but does not contain any thing which can be harmful to human health.
   a) Wholesome water
   b) Surface water
   c) Rain water
   d) Impure Water
2) _____ and _____ are types of impurities.
   a) Soluble
   b) Colloidal
   c) a and b both
   d) micro
3) Which of the following represents the physical characteristics of water?
   a) Chloride
   b) BOD
   c) Turbidity
   d) COD
4) The colour of sewage indicates the _____ of sewage.
   a) Freshness
   b) Smell
   c) Taste
   d) None of above
5) The water which is tasteful for drinking and aesthetically not pure is known as palatable water.
   a) True
   b) False
6) The size of suspended impurities ranges from _____mm. a) $0 – 10^{-3}$
   b) $0 – 10^{5}$
   c) 0 – 1
   d) 1 - 5
7) _____ impurities are very finely divided dispersion of particles in water. a) Suspended
   b) Colloidal
   c) Dissolved
   d) All of the above
8) _____ is example of suspended impurities.

a) Sand
b) Carbonate
c) Metal
d) Chloride

9) Water is collected from _____ or faucet.
   a) Top
   b) Tap
   c) Bottom
   d) Periphery

10) Poor Quality of water is _____ in use.
   a) Reduction
   b) Increase
   c) Collected
   d) Eliminated

11) Physical examination for water can be collected in fully _____ plastic jarricans. a) Impure
   b) Clean
   c) Chemical
   d) Calibrated

12) _____ is the average consumption of the year.
   a) Flow demand
   b) Direct flow demand
   c) Per capita demand
   d) Load demand

13) _____ of water also changes with temperature.
   a) Odour
   b) Colour
   c) Temperature
   d) Taste

14) _____ in a water sample can be directly determined by evaporating the water and weighing the residue.
   a) Hardness
   b) Total Solids
   c) Chloride
   d) Iron

15) Wholesome water should be free from all _____matter.
   a) Objectionable
   b) Colour
   c) Odour
   d) Taste

16) Water demand varies from _____.
   a) Season to season
   b) Flow through

c) System through
d) None of above

17) Potable water should be _____.
a) Free form
b) Odourless
c) Chlorinated
d) Impure

18) Cold countries the quantity of water required is less as compared with _____climates.
a) Hotter
b) All season
c) Monsoon
d) None of above

19) Losses and wastes due to leakage are considerable increased if _____ is high. a) Climate
b) Pressure
c) Valve
d) Season

20) Cost of the water directly affects its_____.
a) Value
b) Market
c) Demand
d) error

21) In water treatment which factor which has a major control over reaction selectivity and product distribution?
a) pH
b) Temperature
c) Pressure
d) ionic concentration

22) Suspended solids are measured by which of the following?
a) Turbidity rod
b) Gravimetric test
c) Chromatography
d) Jackson's turbidity meter

23) Threshold odour number testing is preferred in hot water.
a) True
b) False

24) The permissible limit of turbidity of domestic water is ____ ppm. a) 5-10
b) 1-5
c) 10-50
d) 10-30

25) Chlorides are estimated by titration with a standard silver nitrate solution by using _____ as an indicator.

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

26) What is the indicator used in EDTA method?
a) Potassium chromate
b) Potassium dichromate
c) Potassium chloride
d) Erio chrome, black T

27) The average quantity of water (in lpcd) required for domestic purposes according to IS code is _____
a) 100
b) 120
c) 70
d) 135

28) The average consumption of water required in factories in lpcd is _____ a) 10-15
b) 20-30
c) 30-45
d) 70-80

29) In which type of water demand, minimum average consumption of water takes place?
a) Domestic water demand
b) Industrial water demand
c) Institutional and commercial water demand
d) Fire demand

30) Which is the correct statement regarding per capita demand?
a) Daily water required by an individual
b) Water required for various purposes by a person
c) Water required by an individual in a year
d) Annual average amount of daily water required by one person

31) What are the factors affecting per capita demand?

a) Size of city
b) Size of city, habit of people
c) Cost of water, quality of water, size of city
d) all of the above

32)_____ represents the bacterial density that is most likely to be present in water. a) BOD
b) COD
c) MPN
d) Coliform index

33) Which of the following is a better test to identify Coliforms?
a) Coliform index
b) Multiple tube fermentation
c) MPN test

d) Membrane filter technique

34) What is the temperature at which MPN test is performed?
   a) 35^{o}C
   b) 37 ^{o}C
   c) 40^{o}C
   d) 45 ^{o}C

35) Which of the following is the disease caused by bacterial infections?
   a) Amoebic dysentery
   b) Infectious hepatitis
   c) Typhoid fever
   d) Poliomyelitis

36) If the acid and gas are formed in the multiple tube fermentation technique, the test is _____
   a) Positive
   b) Continued
   c) Negative
   d) Discarded

37) _____ is example of dissolved impurities.
   a) Bacteria
   b) Gases
   c) Clays
   d) Algae

38) Portable water should be moderately _____.
   a) Soft
   b) Cool
   c) Waste
   d) All of the above

39) Quantity of water required for domestic use mainly depends on _____.
   a) Population
   b) Supply
   c) Climatic condition
   d) All of the above

40) What is the design period for the water treatment unit?
   a) 10 years
   b) 15 years
   c) 20 years
   d) 30 years

41) Water is collected from ground sources.
   a) True
   b) False

42) Physical examination water cannot collect in fully cleaned ordinary buckets.
   a) True
   b) False

43) 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

44) The range of temperature of water that is required to do the temperature test is _____
   a) 10-25^{0}C
   b) 0-25^{0}C
   c) 10-30^{0}C
   d) 20-30^{0}C

45) Which of the following statement is wrong regarding turbidity?
   a) It is an extent to which light is absorbed by particles in the water
   b) It is expressed in ppm
   c) It depends on the fineness of particle present in the water
   d) Turbidity rod is a laboratory method to measure turbidity

46) The permissible limit of turbidity of domestic water is ____ ppm.
   a) 5-10
   b) 1-5
   c) 10-50
   d) 10-30

47) The permissible limit of pH preferred for potable water is ___ ppm. a) 6.5-9
   b) 7-8.5
   c) 10-14
   d) 0-7

48) What is the concentration of H+ ions in moles/L in water if the pOH value is 6? a) 10^{-6}
   b) 10^{-7}
   c) 10^{-8}
   d) 10^{-9}

49)The number of bacterial colonies by Agar plate count test should not exceed ____ per ml for potable water. a) 1
   b) 10
   c) 100
   d) 1000

50) Gelatin liquefying bacteria are helpful in the manufacturing of photographic films.
   a) True
   b) False

Unit 2

1) 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

2) Flocculation of iron from water by the addition of lime is an example of which of the following process?
   a) Chemical precipitation
   b) Chemical coagulation
   c) Ion exchange
   d) Adsorption
3) Unit operations are the _____ operations to remove the impurities.

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

4) What did the structures use to prevent floating matter that enters into pumps and pumping systems?
   a) Aeration units
   b) Screens
   c) Grit chamber
   d) Bioreactor
5) _____ is simply detaining water for a sufficient time.
   a) Coagulation
   b) Flocculation
   c) Sedimentation
   d) Filtration
6) What is the size of openings of a coarse screen?
   a) 6mm-150mm
   b) 150-200mm
   c) >200mm
   d) < 6mm
7) While designing a mechanical screen, the clear space between the bars would be in what range?
   a) 15-75mm
   b) 25-50mm
   c) 20-40mm
   d) >75mm
8) What is the maximum approach velocity to be considered for a mechanical screen while designing it?
   a) 0.3-0.5m/s
   b) 0.6-1m/s
   c) 1-1.5m/s
   d) 2 m/s
9) What is the size of the openings for a fine screen?
   a) 0.1 mm

b) 0.8-1mm
c) 0.2-0.6mm
d) 1-3mm

10) Which type of mixers are used to mix coagulants like alum, ferric ammonium sulphate and coagulant aids such as polyelectrolyte and lime?
a) Static mixers
b) Mechanical mixers
c) Mechanical aerators
d) Paddle mixers

11) Which type of mixer is used when the flow needs to be changed often?
a) Paddle mixer
b) Static mixer
c) Mechanical mixer
d) Mechanical aerator

12) In order to prevent clogging what should be provided prior to tube settlers? a) Clarifiers
b) Coarse screen
c) Fine screen
d) Grit chamber

13) How many types of screens are present?
a) 3
b) 4
c) 2
d) 5

14) Lower the velocity through the screen, the _____ is the amount of screening that would be removed.
a) Lower
b) Greater
c) Lesser
d) Stronger

15) Which of the following does the quantity of screening does not depend on?
a) Type of rack
b) Type of screen
c) Type of sewer system
d) Temperature

16) What is the maximum allowable head loss for a manual coarse screen?
a) 150mm
b) 300 mm
c) 200 mm
d) 100mm

17) At what angle generally a coarse manual screen is placed?
a) 60 degree
b) 50 degree
c) 65-70 degree

d) 30-45 degree

18) Which of these screens can handle very large particles?
a) Reciprocating rake
b) Continuous belt
c) Front clean/Front return
d) Front clean/back return

19) With respect to the operation which of these screens is the most expensive?
a) Chain driven
b) Continuous belt
c) Catenary
d) Reciprocating

20) Which of these types of screen can be used both as a fine and coarse screen?
a) Continuous belt
b) Catenary
c) Reciprocating
d) Chain driven

21) What is the size of the openings for a microscreen?
a) 35-50µm
b) 10-35µm
c) 50-60µm
d) 60-6µm

22) What is the removal efficiency of TSS in case of microscreens?
a) 80-85%
b) 85-90%
c) <10%
d) 10-80%

23) Which of the following should be provided in the case where aeration is absent?
a) Screening devices
b) Mechanical mixers
c) Grit removers
d) Sedimentation tank

24) Which coagulant is the most common used ?
a) Alum
b) Ferric sulphate
c) Limestone
d) Coal

25) Which of these remove coarse materials?
a) Coarse screen
b) Grit chamber
c) Fine screen
d) Commutors

26) Which type of treatment is the coarse screen?
a) Preliminary treatment

b) Primary treatment
c) Secondary treatment
d) Tertiary treatment

27) What does zero discharge actually refer to?
a) There is zero discharge of ions
b) The reject is recycled from every part of the treatment plant
c) The reject is not rejected out. Influent equals effluent
d) 100 percent efficient plant

28) Oil and grease is the presence of inorganics in wastewater.
a) True
b) False

29) What is the size of the oil droplets?
a) Less than 50 microns
b) Less than 40 microns
c) Less than 30 microns
d) Less than 20 microns

30) What is the colour of the emulsion?
a) White
b) Grey
c) Black
d) Yellow

31) _____ act as a coupling agent between oil oil/water phases. a) Oil
b) Water
c) Emulsifier
d) Disinfectants

32) Fine screen are made up of fine wire or perforated metal with openings less than 1cm wide.
a) True
b) False

33) Coarse screen are normally kept inclined at _____ to horizontal. a) 45^0 to 60^0
b) 80^0 to 90^0
c) 10^0 to 20^0
d) None of above

34) _____ is device with openings generally of uniform size for remove bigger suspended or floating matter in sewage a) Grit chamber
b) Screen
c) Aeration tank
d) Sand filter

35) Bar screen may be _____ or medium screen.
a) Coarse
b) Low
c) High
d) Intermediate

36) Medium size screening can be disposed by _____ method.
   a) Incineration
   b) Digestion
   c) Burial
   d) All of the above
37) All lighter matter than water float on surface.
   a) True
   b) False
38) _____ tanks are used for removing oil, grease and fats of the sewage. a) Screen
   b) Skimming
   c) Aeration
   d) Sedimentation
39) Objectionable gases such as _____ are expelled from the sewage.
   a) Hydrogen sulphide
   b) Nitrogen
   c) Carbon dioxide
   d) All of the above
40) Skimming are usually disposed of by _____ in the ground.
   a) Pressure through
   b) Burning
   c) Landfilling
   d) None of above
41) Inorganic suspended solids having specific gravity of about _____.
   a) 2.65
   b) 1.00
   c) 1.45
   d) 2.10
42) Plain sedimentation tanks for removal of _____ solids.
   a) Non settleable
   b) Settleable
   c) Colloidal
   d) Dissolved
43) Settling velocity increases with size of _____.
   a) Particle
   b) Clay
   c) Waste
   d) None of above
44) Sedimentation tank may be circular and _____.
   a) Triangle
   b) Hexagonal
   c) Rectangular
   d) All of the above

45) When impurities are separated from suspending fluid by action of _____ forces.
   a) Natural
   b) Artificial
   c) Quality
   d) High
46) In plain sedimentation _____quantity of chemicals is required in treatment process.
   a) Less
   b) More
   c) Neutral
   d) None of above
47) Plain sedimentation tank there are no _____is lost with sludge discharged from plain settling basin. a) Waste
   b) Chemical
   c) Colour
   d) Turbidity
48) In fill and draw type tank detention period _____ allowed.
   a) 24 hours
   b) 22 hours
   c) 60 seconds
   d) 30 minutes
49) Coarse screens are normally kept inclined at _____ to horizontal.
   a) 45 to 60 ^{0}C
   b) 80 to 100 ^{0}C
   c) 20 to 50 ^{0}C
   d) 30 to 50 ^{0}C
50) Coarse screens clear opening area should be velocity of flow is not exceed _____.
   a) 0.8 to 1 m/sec
   b) 0.4 to 0.6 m/sec
   c) 0.2 to 0.6 m/sec
   d) 0.1 to 0.4 m/sec

Unit 3

1) _____ should be mechanically strong, resistant to corrosive action of fluid.
   a) Filter medium
   b) Sedimentation
   c) Screen
   d) Grit chamber
2) _____ are added to aid filtration.
   a) Flocculants
   b) Screen
   c) Coagulant
   d) Aeration

3) _____collects the suspended impurities in water, enhancing the effectiveness of disinfection.
   a) Coagulant
   b) Sedimentation
   c) Filtration
   d) Aeration
4) Process of passing the water through the beds of granular material is known as _____. a) Filtration
   b) Coagulant
   c) Sedimentation
   d) Disinfection
5) Small particles of suspended impurities move through the pores in sand, come in contact with sand surface. a) False
   b) True
6) _____ particles thus settle down in the voids and get removed. a) Finer
   b) Colloidal
   c) Large
   d) Small
7) Organic impurities form a layer on the top of sand bed which is known as _____. a) Sedimentation
   b) Biological action
   c) Dirty skin
   d) Straining
8) Charge of filter medium _____the charge of floc thereby permitting floc to removed.
   a) Neutralises
   b) Positive
   c) Zero
   d) 2
9) Water from _____tank is allowed to enter the inlet chamber and get distributed uniformly over the filter bed. a) Screen
   b) Grit chamber
   c) plain sedimentation
   d) coagulant
10) _____ is example of gravity filter.
   a) Slow sand filter
   b) Pressure filter
   c) Vacuum filter
   d) Horizontal filter
11) Pressure filters unit require very _____ area for their installation.
   a) Small
   b) Large
   c) Medium
   d) None of above

12) In _____filters no sedimentation and coagulant tanks are required. a) Gravity filter
    b) Slow sand filter
    c) Rapid sand filter
    d) Pressure filter
13) Slow sand filter requires very _____ area.
    a) Large
    b) Small
    c) Medium
    d) None of above
14) Rapid sand filter is required _____ cost of maintenance.
    a) Less
    b) Medium
    c) More
    d) None of above
15) Rapid gravity filters are used for _____ municipal supplies.
    a) Large
    b) Small
    c) Medium
    d) None of above
16) Filter media consists of sand layer about _____ in depth and placed over a gravel support.
    a) 60 to 90 cm
    b) 70 to 80 cm
    c) 30 to 40 cm
    d) 20 to 30 cm
17) Filter sand media is supported on base material consisting of graded _____ layers.
    a) Sand
    b) Gravel
    c) Waste
    d) All of the above
18) When sand becomes dirty as indicated by excessive _____the filter must be cleaned and washed. a) Loss of head
    b) Loss of ignite
    c) Volume loss
    d) None of above
19) Rapid gravity filters get clogged very frequently and have to washed every _____. a) 60 minutes
    b) 20 hours
    c) 24 to 48 hours
    d) 22 to 24 hours
20) Amount of water required for washing may vary from _____ of total amount of water filtered. a) 2 to 5 %

b) 6 to 9%
c) 10 to 12%
d) 14 to 16 %

21) Slow sand filter media depth is _____.
a) 10 to 50 cm
b) 90 to 110 cm
c) 50 to 70 cm
d) 60 to 90 cm

22) In Rapid sand filter skilled supervision is _____.
a) Most essential
b) Not required
c) Not educated
d) Educated

23) Pressure filter is type of rapid sand filter placed within a closed, watertight steel cylinder.
a) True
b) False

24) _____ are used for industrial plants, but are not economical on large scale. a) Slow sand filters
b) Rapid sand filters
c) Pressure filters
d) None of above

25) Water percolates through the filter media and gets purified during process of _____. a) Filtration
b) Screen
c) Aeration
d) Sedimentation

26) The difference of water level in the filter basin and outlet chamber is known as _____. a) Gravity
b) Pressure
c) Head loss
d) Volume loss

27) Calcium and magnesium carbonates are insoluble in water and are removed by _____tanks. a) Sedimentation
b) Aeration
c) Coagulant
d) Pressure

28) Water contains temporary as well as permanent hardness is done by _____ methods.
a) Coagulation
b) Filtration
c) Softening
d) Carbonation

29) Permanent hardness of water may be removed by the addition of _____.

a) Lime
b) soda ash
c) potassium permagnate
d) sodium bicarbonate

30) Both temporary and permanent hardness of water can be removed on boiling water with _____.
a) calcium hydroxide
b) sodium carbonate
c) calcium oxide
d) calcium carbonate

31) Temporary hardness of water may be removed by adding _____.
a) calcium hydroxide
b) calcium carbonate
c) calcium chloride
d) sodium bicarbonate

32) Permanent hardness of water is caused by the presence of _____.
a) bicarbonates of calcium and magnesium
b) carbonates of sodium and potassium
c) chlorides and sulfates of calcium and magnesium
d) phosphates of sodium and potassium

33) Temporary hardness of water is caused by the presence of _____.
a) chlorides of calcium and magnesium
b) sulfates of calcium and magnesium
c) bicarbonates of calcium and magnesium
d) carbonates of sodium and potassium

34) Zeolite softening process removes _____.
a) only temporary hardness of water
b) only permanent hardness of water
c) both temporary and permanent hardness of water
d) the dissolved gases in permanent hard water

35) When temporary hard water is boiled, one of the substances formed is _____.
a) calcium bicarbonate
b) calcium sulfate
c) hydrogen chloride
d) carbon dioxide

36) Zeolite softening process removes both temporary and permanent hardness of water. In this process the calcium and magnesium present in water are precipitated as _____.
a) insoluble carbonates
b) insoluble zeolites
c) insoluble chlorides
d) insoluble sulfates

37) The process of passing the water through beds of sand or other granular material is known as_____.

a) Filtration
b) Sedimentation
c) Coagulation
d) Electrolytic

38) Which of the following is not the application of filtration?

a) Sterilization of media
b) Removal of debris
c) Plasma clarification
d) Off-gas analysis

39) Which of the following does not influence filtration?

a) Temperature
b) Density
c) Viscosity
d) pH

40) Filtration is a steady state.

a) True
b) False

41) In surface filtration, the size of particles retained is higher than the mean pore size of the medium.

a) True

b) False

42) Which of the following process is used to separate insoluble particles from liquids?

a) Filtration
b) Extraction
c) Drying
d) Sieving

43) Organic impurities form a layer on the top of sand bed which is known as _____.

a) Straining
b) Dirty skin
c) Filtration
d) Electrolytic action

44) The removal or reduction of hardness from the water is known as water _____.

a) Hardness
b) Softening
c) Boiling
d) Melting

45) _____ hardness is mainly due to presence of bicarbonate of calcium and magnesium.

a) Bicarbonate

b) Non – carbonate
c) Carbonate
d) None of above

46) Calcium and magnesium carbonate are _____ in water and removed by sedimentation tank.

a) Insoluble
b) Soluble
c) Highly concentrated
d) Low concentration

47) Example of filter for continuous mode of filtration _____.

a) Plate and frame
b) Spiral wound
c) Rotary vacuum
d) Tubular

48) slow sand filter effective size of sand is _____.

a) 0.2 to 0.3 mm
b) 0.6 to 0.8 mm
c) 1 to 2 mm
d) 2 to 4 mm

49) Depth of sand bed should between _____.

a) 10 to 30 cm
b) 40 to 50 cm
c) 60 to 90 cm
d) 100 to 120 cm

50) Filter media requires cleaning after _____.

a) 20 to 40 days
b) 60 to 80 days
c) 5 to 10 days
d) 10 to 20 days

Unit 4

1) Which of the following method is not used for desalination?

a) Distillation
b) Coagulation
c) Reverse osmosis
d) Freezing

2) The process of killing the pathogenic bacteria from the water and killing it safe to user is called_____.

a) Disinfection
b) Coagulation
c) Backwashing
d) Freezing

3) The amount of chlorine consumed in the oxidation of these impurities before any disinfection is achieved is known as_____.

a) Chlorination
b) Chlorine demand
c) Impurities
d) None of above

4) Which of the following technique is not used for the desalination of brackish water?

a) Electrolysis
b) Electrodialysis
c) Reverse osmosis
d) Distillation

5) _____ is process of bringing wastewater to its boiling point and vaporizing pure water.

a) Desalination
b) Evaporation
c) Chlorination
d) electrolysis

6) _____ is membrane technology filtration method that removes many types of large molecules and ions from solution by applying pressure to solution.

a) Reverse osmosis
b) Distillation
c) Disinfection
d) Freezing

7) When water is electrolyzed, the gas collected at cathode, is _____.

a) sulphur
b) oxygen
c) hydrogen
d) sulphur dioxide

8) High bod and cod can also affect to _____.

a) Membrane
b) Flow
c) Velocity
d) Viscosity

9) _____ means negatively charged anions towards anode and positively charged cations toward cathode.

a) Membrane
b) Electro dialysis
c) Freezing
d) Desalination

10) The example of brackish water is _____.

a) Ground water
b) Rain water

c) Sea water
d) Underground water

11) Which water treatment process is done after filtration of water?
a) Primary sedimentation
b) Disinfection
c) Secondary sedimentation
d) Flocculation

12) Which of the following is wrong regarding disinfection?
a) It should be readily available at reasonable cost
b) Its method of application should be simple
c) It should render the water toxic for its intended use
d) It should act as safeguard against re-contamination

13) Boiling of water is a _____ method of disinfection.
a) Physical
b) Chemical
c) Mechanical
d) Electrical

14) Sunlight is a _____ method of disinfection.
a) Physical
b) Chemical
c) Mechanical
d) Electrical

15) Which of the following is a chemical method of disinfection?
a) Disinfection by heat
b) Disinfection by light
c) Metal ions
d) Metal ions, Alkalis and acids

16) Which method of disinfection is mainly used in rural areas? ?
a) Boiling method
b) Excess lime treatment
c) Potassium permanganate treatment
d) Silver treatment

17) _____ is used to indicate only chlorine treatment has been given to raw water. a) Plain chlorination
b) Dichlorination
c) Super chlorination
d) Super chlorination

18) _____ is excellent disinfectant.
a) Ozone
b) Chlorine
c) Nitrogen
d) Carbon

19) Which of the following process does not kill bacterial endospores?
    a) Hot air sterilization
    b) Incineration
    c) Pasteurization
    d) Autoclave
20) Ultra violet rays are _____ light rays having wavelength of 1000 to 4000 m. a) Visible
    b) Invisible
    c) Hazardous
    d) Colourless
21) _____ also removes colour, odour and taste from water.
    a) Nitrogen
    b) Carbon
    c) Ozone
    d) Methane
22) _____is added to water it reacts with organic and inorganic matter and forms common compounds.
    a) Chlorine
    b) Ozone
    c) Carbon
    d) Oxygen
23) The adding of chlorine in excess is called _____.
    a) chlorination
    b) Super chlorination
    c) Break point chlorination
    d) Dichlorination
24) When chlorine is added to raw water before any treatment is known as _____. a) Pre chlorination
    b) Post chlorination
    c) Double chlorination
    d) Super chlorination
25) _____ are produced by adding ammonia to filtered water before adding chlorine.
    a) Chlorine dioxide
    b) Chloramines
    c) Chlorine
    d) Nitrogen
26) Sterilization is the
    a) killing or removal of all microorganisms in a material or an object
    b) reduction of the number of pathogenic microorganisms in a material or object.
    c) killing or removal of some but not all microorganisms.
    d) disinfection of living tissue
27) Membrane permeation rate increases proportionally to effective pressure.
    a) True

b) False

28) RO membranes are made of _____
   a) Plastic
   b) Cotton
   c) Silk
   d) Polymer

29) The osmotic pressure of the brine increases proportionally to the salt concentration. a) True
   b) False

30) The water flux of RO membranes _____ as water viscosity lowers.
   a) Increases
   b) Decreases
   c) Alters
   d) Fluctuates

31) Reverse osmosis helps in mineralizing water.
   a) True
   b) False

32) _____ is used for the RO process.

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

33) A reverse osmosis membrane is a semi-permeable membrane that allows the passage of _____

a) Water
b) Dissolved salts
c) Organics
d) Bacteria

34) In RO, pressure that is greater than the naturally occurring osmotic pressure is applied in order to _____

a) Mineralize water
b) Desalinate water
c) Decompose organics
d) Push bacteria across membrane

35) The amount of pressure to be applied depends on _____

a) Organic content
b) Salt concentration
c) Bacteria
d) Membrane strength

36) The chlorine, which serves as a disinfectant is _____

a) Free chlorine
b) Free Residual chlorine

c) Chlorine demand
d) Residual demand

37) The process of chlorination with hypochlorites is called _____
a) Super chlorination
b) Pre chlorination
c) Post chlorination
d) Hypo-chlorination

38) What is the contact period for disinfection with chloramine?
a) 1hour
b) 2hours
c) 3hours
d) 4hours

39) Super chlorination gives a strong odour and taste of chlorine in treated water which can removed by _____.

a) dechlorination
b) break point chlorination
c) softening
d) boiling

40) The removal or reduction of hardness from the water is known as water _____.
a) softening
b) chlorination
c) boiling
d) break point

Unit 5

1) _____condition the bacteria consume oxygen and remain active without causing any foul smell is created.

a) Aerobic
b) Anaerobic
c) Anoxic
d) Diffuser

2) Activated sludge process uses micro-organisms to degrade organics from wastewater.
a) True
b) False

3) Activated sludge process degrade organics and _____.
a) Improve nutrients
b) Remove nutrients
c) Remove odour
d) Remove taste

4) What is required to keep the activated sludge suspended?
a) Carbon-dioxide
b) Nitrogen

c) Oxygen
d) Ammonia

5) What does the bacterium use to grow?
a) Oxygen
b) Organic pollutants
c) Water
d) Carbon-dioxide

6) Activated sludge process can be used for treating all types of wastewater.
a) True
b) False

7) _____ provides the dual purpose of providing DO and mixing of the mixed liquor and wastewater.
a) Flocculation
b) Aeration
c) Sedimentation
d) Clarification

8) Trickling filter can also be called as a biofilter.
a) True
b) False

9) _____ in trickling filter contains many species like bacteria and round worms.
a) Treated water
b) Wastewater
c) Biofilm
d) Air influent

10) What is the shape of a typical trickling filter?
a) Circular
b) Cylindrical
c) Square
d) Rectangular

11) Which type of bacteria are used in trickling filters?
a) Facultative
b) Nitrifying
c) Anaerobic
d) Blue-green bacteria

12) In trickling filter, B.O.D. is reduced to_____?
a) 30 to 40%
b) 40 to 60%
c) 60 to 80%
d) 80 to 90%

13) _____ is a process which involves further removal of the nitrogen.
a) Nitrification
b) Denitrification
c) Ammonification
d) Reduction

14) Aerobic wastewater treatment is a biological process that takes place in the_____ of oxygen.
   a) Presence
   b) Absence
   c) Multi
   d) Legal
15) The bacteria convert the organic matters into stable inorganic forms by _____. a) Oxidizing
   b) Reduction
   c) Conversation
   d) Hydrolysis
16) Operation of intermediate sand filter is _____ only mechanical equipment is required for dosing. a) Difficult
   b) Simple
   c) Intermediate
   d) Combine
17) Low rate trickling filter organic load is _____.
   a) 80 to 320 mg/d/m3
   b) 100 to 110 mg/d/m3
   c) 10 to 50 mg/d/m3
   d) 50 to 80 mg/d/m3
18) Media depth for low rate filter range is _____.
   a) 20 to 30 m
   b) 1.8 to 3 m
   c) 5 to 6 m
   d) 8 to 12 m
19) The breaking of the biomass from the slime layer in conventional filter is called _____
   a) Sloughing
   b) Carbonation
   c) Biological magnification
   d) Weathering
20) _____ is biochemical phenomenon involving organisms, enzymes, food and environment.
   a) Sludge digestion
   b) Aeration
   c) Mixing
   d) Flocculator
21) Solids is converted into liquid and gases due to which volume of sludge _____%. a) 50 – 60
   b) 60 – 65
   c) 60 – 75
   d) 10 – 30

22) _____ stage the acid forming bacteria stabilize the organic solids through hydrolysis. a) Acid fermentation stage

b) Methane fermentation

c) Sludge digestor

d) Sloughing