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Q : 1) Water distribution systems are sized to meet the:

A : Maximum hourly demand

B : Average hourly demand

C : Maximum daily demand and file demand

D : Average daily demand and fire demand

Q : 2) The peak factor suggested by CPHEEO for computing carrying capacity in the design of sewars for the contributory population of 20,0000 is

A : 2.00

B : 2.25

C : 2.50

D : 3.00

Q : 3) Water supply projects, under normal circumstances may be planned for a design period of:

A : 10 years

B : 20 years

C : 30 years

D : 50 years

Q : 4) Match List-I with List-II and select the most appropriate answer using the codes given below the lists:

List-I (Bacteria)	List-II (Process)
A. Hourly peak demand is	1. 180% of average demand
B. Daily peak demand is	2. 270% of average demand
C. Monthly peak demand is	3. 100% of average demand
D. Yearly peak demand is	4. 128% of average demand

Codes :

A : 1, 2, 4, 3 **B : 4, 3, 2, 1**

C : 1, 3, 2, 4 **D : 1, 3, 2, 4**

Q : 5) In which one of the following industries, the water requirement in kilo litres per unit of production is very high?

A : Paper industry

B : Steel industry

C : Sugar industry

D : Fertilizer industry

Q : 6) In which one of the following industries, the water requirement in kilo litres per unit of production is very high?

A : Paper industry

B : Steel industry

C : Sugar industry

D : Fertilizer industry

Q : 7) The trap efficiency of a reservoir depends on the

A : Capacity the reservoir

B : Inflow of the reservoir

C : Capacity inflow ratio

D : Capacity – outflow ratio

Q : 8) Water may not contain much impurities if its source is:

A : Reservoirs

B : Stream flowing in plains

C : Lake in lower regions

D : Spring along hill slopes

Q : 9) If within a zone of saturation, an impervious deposit below a pervious deposit is found to support a body of saturated material, then this body of saturated material is known as-

A : Plowing well

B : Aquiclude

C : Artesian aquifer

D : Perched aquifer

Q : 10) The measure of the amount to which light is absorbed or scattered by the suspended material in water is called:

A : Opacity

B : Turbidity

C : Diffraction

D : None of the above

Q : 11) As per IS 10500 : 1991, the desirable limit of dissolved solids in drinking water is:

A : 200 mg/l

B : 230 mg/l

C : 150 mg/l

D : 500 mg/l

Q : 12) Dental cavities, a disease caused by drinking water due to

A : Excess fluorides

B : Absence of fluorides

C : Excess of nitrates

D : Presence of lead

Q : 13) Indian standard for acceptable limit of arsenic is

A : 0.01 mg/L

B : 0.05 mg/L

C : 0.005 mg/L

D : 0.001 mg/L

Q : 14) In a water treatment plant, dissolved iron and manganese can be removed from the water by-

A : Aeration

B : Aeration and coagulation

C : Aeration and filtration

D : Aeration and sedimentation

Q : 15) Identify the instrument which is not used to measure the turbidity of water sample

A : Nephlo turbidity meter

B : Jackson turbidity meter

C : Aries turbidity meter

D : Baylis turbidity meter

Q : 16) Jackson candle turbidimeter measures turbidity of a sample of water on the basic of

A : Scattering of light

B : Absorption of light

C : Polarization of light

D : Concentration of colloids

Q : 17) Permanent hardness is removed by-

1. Lime soda process
2. Boiling
3. Demineralization process
4. Base exchange process

A : 1 only

B : 2 only

C : All of the above

D : 1, 3 and 4

Q : 18) If the methyl orange alkalinity of water equals or exceeds total hardness, all of the hardness is:

A : Non carbonate hardness

B : Carbonate hardness

C : Pseudo hardness

D : Negative non-carbonate hardness

Q : 19) The commonly used indicator for measuring iron concentration in water is:

A : Sodium thiosulphate

B : Silver nitrate

C : Eriocchrome black T

D : 1, 10 phenanthraline

Q : 20) The permissible limit of sulphate in the absence of alternate source (Provided that the magnesium does not exceed (30 mg/L) is : _____.

A : 600 mg/L

B : 200 mg/L

C : 250 mg/L

D : 400 mg/L

Q : 21) Match List-I with List-II and select the correct answer using the code given below the lists:

List-I (Impurity in drinking water)	List-II (Harm caused)
A. Excess of nitrates	1. Brackish water
B. Excess of fluorides	2. Goiter
C. Lack of iodides	3. Fragile bones
D. Excess of chlorides	4. Blue babies

Codes :

A : 4, 2, 3, 1 **B : 1, 2, 3,4**

C : 4, 3, 2, 1 **D : 1, 3, 2, 4**

Q : 22) If the depletion of oxygen is found to be 5 ppm after incubating a 2.5% solution of sewage sample for 5 days at 20°C, BOD of the sewage is

A : 50 ppm

B : 100 ppm

C : 150 ppm

D : 200 ppm

Q : 23) The true relation between theoretical oxygen demand (TOD), Biochemical oxygen demand (BOD) and chemical oxygen demand (COD) is given by

A : TOD > BOD > COD

B : TOD > COD > BOD

C : BOD > COD > TOD

D : COD > BOD > TOD

Q : 24) The following zones are formed in a polluted river under the self-purification process.

A. Zone of clear water
B. Zone of active decomposition
C. Zone of recovery
D. Zone of pollution

The correct sequence in which these zones occur progressively downstream in a polluted rivet is

A : 4, 2, 1, 3

B : 4, 2, 3, 1

C : 2, 4, 3, 1

D : 2, 4, 1, 3

Q : 25) Which of the following is NOT an advantage of chloramines-ammonia treatment of water?

A : It is less effective than chlorine alone

B : It prevents bad taste and odour

C : There is no danger of overdoes

D : Quantity of chlorine require is reduced especially if organic matter is present in large amounts

Q : 26) Match List-I (type of water source) with List-II (Treatment required) and select the correct answer using the codes given below the lists:

List-I (Type of water source)	List-II (Treatment required)
A. Surface water (river / canal)	1. Aeration, coagulation sedimentation and disinfection
B. Water of infiltration gallery	2. Disinfection
C. Lake / pond water	3. $CuSO_4$ treatment, coagulation, sedimentation, filtration and disinfection
D. Tube-well water	4. Coagulation, flocculation sedimentation, filtration and disinfection

Codes :

A : 4, 1, 3, 2 **B : 1, 4, 3, 2**

C : 1, 4, 2, 3 **D : 4, 1, 2, 3**

Q : 27) Consider the following unit process commonly used in water treatment, Rapid mixing (RM), flocculation (F), Primary sedimentation (PS), secondary sedimentation (SS), chlorination ©, and rapid sand filtration (RSF). The order of these unit processes (First to last) in conventional water treatment plant is:

A : PS → RSF → F → RM → SS → C

B : PS → F → RM → RSF → SS → C

C : PS → F → SS → RSF → RM → C

D : PS → RM → F → SS → RSF → C

Q : 28) In a water distribution network, which of the following values will work automatically?

A : Check valve

B : Butterfly valve

C : Scour valve

D : Sluice valve

Q : 29) Self purification of running streams may be due to:

A : Sedimentation, oxidation and coagulation

B : Dilution, sedimentation and oxidation

C : Dilution, sedimentation and coagulation

D : Dilution, oxidation and coagulation

Q : 30) As per the Royal commission report on sewage disposal standards of purification required for waste water having dilution factor above 500 is:

A : Tertiary treatment required

B : Treatment such as sedimentation, screening and chemical precipitation is required

C : No treatment required

D : Plain sedimentation is required

Q : 31) In water treatment, rapid gravity filters are adopted to remove:

A : Dissolved organic substances

B : Dissolved solids and gases

C : Floating solids and dissolved inorganic solids

D : Bacteria and colloidal solids

Q : 32) The area of the openings in screen should be such that the velocity of flow through them does not exceed

A : 0.75 to 1 m/s

B : 1.5 to 3 m/s

C : 3 to 5 m/s

D : 5 to 6 m/s

Q : 33) Match the following:

List-I	List-II
A. Dead end system	P. It is suitable for cities with rectangular layout, where the water mains and branches are laid in rectangles.
B. Grid Iron system	Q. The area is divided into different zones. The water is pumped into the distribution reservoir kept in the middle of each zone.
C. Ring system	R. It is suitable for old towns and cities having no definite pattern of roads.
D. Radial system	S. The supply main is laid all along the peripheral roads and sub-mains branch out from the mains.

A : A-P, B-S, C-P, D-R

B : A-Q, B-S, C-R, D-P

C : A-R, B-S, C-R, D-Q

D : A-S, B-R, C-P, D-Q

Q : 34) A town is required to treat 4.2 m^3/min of raw water fir daily domestic supply. Flocculating particles are to be produced by chemical coagulation. A column analysis indicated that an overflow rate of 0.2 mm/sec will produce satisfactory particle removal in a setting basin at a depth of 3.5 m. The required surface area (in m^2) for setting is:

A : 200

B : 350

C : 420

D : 840

Q : 35) For proper slow mixing in the flocculator of water treatment plant, the temporal mean velocity gradient G needs to be of the order of

A : 1.5 to 10 S^{-1}

B : 100 to 200 S^{-1}

C : 20 to 70 S^{-1}

D : 250 to 350 S^{-1}

Q : 36) The short circulating occurring in a sedimentation tank is represented by

A : Surface loading

B : Displacement efficiency

C : Recirculation ratio

D : Detention time

Q : 37) A rectangular tank 15m × 6m × 3m has to treat 2 million litres of water per day. The determination time of the tank should be:

A : 3.24 hours

B : 5.63 hours

C : 12.0 hours

D : 24 hours

Q : 38) Total kjeldahl nitrogen is the:

A : Summation of organic an ammonical Nitroe

B : Summation of organic and albuminoid nitrogen

C : Summation of organic and free nitrogen

D : Difference of organic and ammonical nitrogen

Q : 39) A floatation unit is usually provided to remove :

A : Suspended solids

B : Oil and grease

C : Grit

D : Stones

Q : 40) The purpose of recarbonation after lime-soda process of water softening is:

A : Removal of excess soda from water

B : Removal of non-carbonate hardness

C : Conversion of precipitates to soluble from

D : Recovery of excess lime

Q : 41) The maximum depth of sedimentation tank is limited up to

A : 2 m

B : 3 m

C : 4 m

D : 6 m

Q : 42) In primary setting tank, suspended solids are reduced from

A : 10 to 20%

B : 20 to 40%

C : 40 to 70%

D : 70 to 90%

Q : 43) Consider the following statements regarding removal of impurities from water:

1. Settleable solids are removed by filtration.
2. Volatile solids are removed through sedimentation
3. Dissolved solids are removed through reverse osmosis.
4. Colloidal solids are removed by coagulation.

Which of the above statements are correct?

A : 1 and 2 only

B : 3 and 4 only

C : 2 and 3 only

D : 1 and 4 only

Q : 44) When the recirculation ratio of trickling filter for sewage treatment is R, then the hydraulic recirculation factor is

A : $\frac{1-R}{1+R}$

B : (1 + R)

C : (1 – R)

D : $\frac{1+R}{1-R}$

Q : 45) In double filtration, the name of the first filter is

A : Roughing filter

B : Pressure filter

C : Rapid sand filter

D : Gravity filter

Q : 46) Effective size to be used in rapid sand gravity filter is

A : 0.15 – 0.30 mm

B : 0.45 – 0.70 mm

C : 0.75 – 0.90 mm

D : 0.95 – 1.100 mm

Q : 47) The maximum permitted loss of head in a rapid sand filter is

A : 1 m

B : 2 m

C : 3 m

D : 4 m

Q : 48) For water purification in a city, it is decided to use rapid sand filter after sedimentation tanks, with the following data: Design loading rate per filter = 200 $m^3/m^2/day$; design flow rate = 0.5 m^3/s; surface area per filter = 55 m^2. The number of filter units required in the plant are:

A : 3

B : 5

C : 4

D : 2

Q : 49) The cleaning of slow sand filter is done by:

A : Scraping off top layers of sand and admitting water

B : Passing air through the filter

C : Passing a solution of air and lime through the filter

D : Reversing the direction off flow of water

Q : 50) Vacuum filters are used for:

A : Filtration of sewage

B : Filtration of sludge

C : Dewatering of sludge

D : Both filtration of sludge

Q : 51) Air binding in rapid sand filters is encountered when:

A : The water is subjected to prolonged aeration

B : The water contains high dissolved aeration

C : The filter bed compresses largely of course sand

D : There is excessive negative head

Q : 52) In which treatment unit is schmutzdecke formed:

A : Sedimentation tank

B : Rapid sand filter

C : Coagulation tank

D : Slow sand filter

Q : 53) Which of the following is incorrect regarding a slow sand filter:

A : Incoming water should not be treated by coagulants

B : Depth of water should be double the depth of filter sand

C : Loss of head is limited to a maximum of 1.2 m

D : Cleaning should not be done by back washing

Q : 54) The hydraulic loading for a high rate trickling filter varies between :

A : 110 to 330 M/L/ per hectare per day

B : 50 to 60 M.L. per hectare per day

C : 500 to 600 M.L. per hectare per day

D : 11 to 33 M.L. per hectare per day

Q : 55) The ‘sag’ in the dissolved oxygen curve results because:

A : It is a function of the rate of addition of oxygen to the stream

B : It is a function of the rate of depletion of oxygen from the stream

C : It is a function of the rate of both addition and depletion of oxygen from the stream

D : The rate of addition of oxygen is linear but the rate of depletion of oxygen is non-linear

Q : 56) The disinfection efficiency of chlorine in water treatment

A : Is not dependent on pH value

B : Is increased by increased pH value

C : Remains constant at all pH value

D : Is reduced by increased pH value

Q : 57) The main disadvantages of lime soda process of water softening is that:

A : It is unsuitable for turbid and acidic water

B : Zero hardness effluent can not be obtained

C : Excessive hard water can not be softened

D : Huge amount of precipitate is formed posing the problem of disposal

Q : 58) The compounds of chlorine commonly used for disinfection are

A : Chloramines

B : Bleaching powder

C : Both chloramines and bleaching power

D : None of these

Q : 59) The suitable method for disinfection of swimming pool water is

A : Ultra violet rays treatment

B : Lime treatment

C : By using potassium permanganate

D : Chlorination

Q : 60) Order 4 disinfectants in increasing order of their disinfection power?

A : Ozone < HOCl < Monochloramine < NCl_3

B : Ozone < NCl_3 < Monochloramine < HOCl

C : NCl_3 < HOCl < Monochloramine < Ozone

D : NCL_3 < Monochloramine < HOCL < Ozone

Q : 61) The efficiency of disinfection by chlorine in water treatment increase by

A : Decrease in time of contact

B : Decrease in temperature of water

C : Increase in temperature of water

D : Pre-chlorination

Q : 62) What is food to micro-organism ratio in an aeration tank having following data?

Flow = 1 MLD, MLSS = 2000 mg/L

Influent BOD_5 – 200 mg/L

Volume of aeration tank = 500 m^3

A : 0.20

B : 5.00

C : 0.80

D : 1.25

Q : 63) The purpose of re-carbonation after water softening by the lime-soda process is the

A : Removal of excess soda from the water

B : Removal of non-carbonate hardness in the water

C : Recovery of lime from the water

D : Conversion of precipitates to soluble forms in the water

Q : 64) Which type of drainage system consists of laterals and sub-mains in which laterals are provided only one side of a sub-main?

A : Double main system

B : Grid iron layout

C : Herring bone pattern

D : Natural system

Q : 65) Concrete pipes are jointed by

A : Collar joint

B : Flush joint

C : Hinge joint

D : (a) or (b)

Q : 66) The type of valve which is provided to regulate the flow of after through the pipelines is

A : Air valve

B : Sluice valve

C : Check valve

D : Globe valve

Q : 67) The four major water supply distribution systems are

A : Dead end, trees, grid iron and reticulation

B : Dead end, trees, grid iron and circular

C : Tress, grid iron ring and radial

D : Tree, reticulation, circular and ring

Q : 68) Ferrule is one of the important appurtenances installed in

A : Combined sewerage system

B : Water distribution system

C : House drainage system

D : Storm sewerage system

Q : 69) Out of the following distribution systems, which have the least number of cut-off valves?

A : Ring system

B : Radial system

C : Dead end system

D : Grid iron system

Q : 70) A goose neck is

A : A bent flexible pipe provided between ferrule and stop-cock

B : A T-shaped brass length between water meter and ferrule

C : A straight G.I. pipe, service pipe and stop-cock

D : A bent rigid pipe between service pipe and water meter

Q : 71) What is the use of sonoscope?

A : Checking the accuracy of water meters

B : Regulating the fire hydrants

C : As a replacement of venturi meter for discharge measurement

D : Detection of leakage in underground water mains

Q : 72) For the same solid content, if the quantity of sludge with moisture content of 98% is X, then the quantity of sludge with moisture content of 96% will be

A : X/4

B : X/2

C : X

D : 2X

Q : 73) The phenomenon by virtue of which soil pores gets clogged with sewage matter is called

A : Sewage farming

B : Sewage bulking

C : Sewage sickness

D : Sewage irrigation

Q : 74) The minimum velocity of flow in a sewer should be ideally

A : Equal to self-cleansing velocity

B : Equal to non-scouring velocity

C : Less than self cleaning velocity

D : More than non-scouring velocity

Q : 75) The proportion of solids in sewage is about:

A : 2.55% or more

B : 1% or more

C : 0.1% or less

D : Zero

Q : 76) The BOD removal efficiency, during primary treatment, under normal conditions are:

A : 65%

B : 55%

C : 85%

D : 30%

Q : 77) The ratio of available oxygen to the required oxygen satisfying the first biochemical oxygen demand is known as :

A : Total organic carbon

B : Total oxygen demand

C : Relative stability

D : Theoretical oxygen demand

Q : 78) The difference between saturated dissolved oxygen content and the actual dissolved oxygen content in the stream at any point during self-purification process is called:

A : Oxygen sag

B : Aeration

C : Re-oxygenation

D : Biochemical oxygen demand

Q : 79) According to IS 3306, the tolerance limits for industrial effluents discharged into public sewer should have effluent temperature not exceeding

A : 10°C

B : 25°C

C : 30°C

D : 45°C

Q : 80) The gradient required to generate self-cleaning velocity case 150 mm diameter sewer is

A : 1 in 300

B : 1 in 200

C : 1 in 150

D : 1 in 100

Q : 81) In the design of storm sewers, "Time of concentration" is relevant to determine the

A : Rainfall intensity

B : Velocity in the sewer

C : Time of travel

D : Area served by the sewer

Q : 82) Sewer that receives sewage from the collecting systems and conducts it to a point of final discharge or to disposal plant is called……

A : Relief sewer

B : Lateral sewer

C : Intercepting sewer

D : Outfall sewer

Q : 83) Which of these shaped traps are NOT used in water closet?

A : P Trap

B : C Trap

C : S Trap

D : Q Trap

Q : 84) The sewer which receives the discharge from number of independent house is called

A : House sewer

B : Intercepting sewer

C : Lateral sewer

D : None of the above

Q : 85) Which of the following statement are true about design of sewers?

1. The flow velocity in the sewers should be such that the suspended materials in sewage get silted up.
2. It is important to limit the maximum velocity in the sewer pipe.
3. It is necessary that the sewer pipes be laid at such a gradient, as to generate self cleaning velocities at different possible discharges.

A : 1 and 2 only

B : 2 and 3 only

C : 1 and 3 only

D : 1, 2 and 3

Q : 86) Three different type of sewers are

A : Sanitary, storm and conventional

B : Sanitary, storm and combined

C : Sanitary, storm and ground water

D : Conventional, surface and combined

Q : 87) Consider the following statements with reference to the mixing of industrial waste water with domestic waste water

1. The industrial waste water can be mixed with domestic water when it has higher BOD.
2. The industrial waste water can be mixed with domestic water when the pH value of industrial waste water is highly alkaline.

Which of the above statements is/are correct?

A : 1 only

B : 2 only

C : Both 1 and 2

D : Neither 1 nor 2

Q : 88) Activated sludge process is an example of:

A : Anaerobic attached growth process

B : Anaerobic suspended growth process

C : Aerobic attached growth process

D : Aerobic suspended growth process

Q : 89) A sewer that receives the discharge of a number of house sewers is called :

A : House sewer

B : Lateral sewer

C : Intercepting sewer

D : None of the above

Q : 90) A device in which sludge is dewatered by rapid rotation and automatically discharged, is known as :

A : Agitator

B : Vacuum suction

C : Centrifuge

D : Filter

Q : 91) Anti-siphonage pipe is used to

A : Provide connection with soil pipe

B : Provide ventilation of air in the toilet

C : Prevent foul smell from entering the toilet

D : Preserve the water-seal of traps

Q : 92) A pipe installed for ventilation process is called :

A : Anti-siphonage pipe

B : Vent pipe

C : Soil pipe

D : Waste pipe

Q : 93) Two pipe system of providing building drainage consists of :

A : One soil pipe + one waste pipe + one vent pipe + One sullage pipe

B : One soil pipe + One waste pipe + two vent pipes

C : Two soil pipes + two waste pipes

D : Two soil pipes only

Q : 94) Which one of the following is not a type of trap used in plumbing?

A : p-type

B : q-type

C : s-type

D : z-type

Q : 95) As per CPHEED manual, the minimum velocity at initial peak flow and ultimate peak flow and ultimate peak flow in a sewer should not be less than,

A : 0.3 m/s and 0.6 m/s

B : 0.6 m/s and 0.8 m/s

C : 0.6 m/s and 1.2 m/s

D : 1.2 m/s and 3 m/s

Q : 96) A pipe which is installed in the house drainage to preserve the water seal of traps is called:

A : vent pipe

B : Anti-siphonage pipe

C : Waste pipe

D : Soil pipe

Q : 97) A 2% solution of sewage sample is incubated for five days at 20°C. The depletion of oxygen was found to be 3 ppm. The BOD of raw sewage will be:

A : 150 ppm

B : 200 ppm

C : 300 ppm

D : 250 ppm

Q : 98) When sewer gets discharged them two or more main sewers it is called

A : Leading sewer

B : Trunk sewer

C : Combing sewer

D : Intercepting sewer

Q : 99) Which of the following, is the method used for land filling of solid waste?

A : Canyon method

B : Bangalore method

C : Load count method

D : Indore method

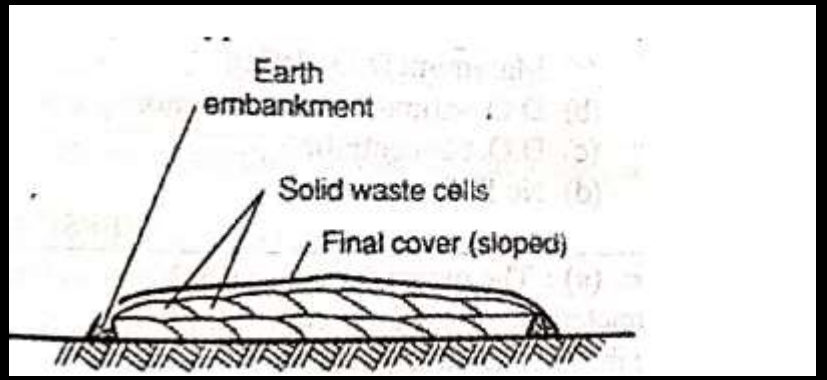
Q : 100) Identify the type of land filling shown in figure.

A : Trench method

B : Indore method

C : Depression method

D : Area method



Q : 101) Bangalore method of composting solid waste involves:

A : Facultative process

B : Cumulative process

C : Anaerobic process

D : Aerobic process

Q : 102) The liquid that collects at the bottom of a landfill is known as:

A : Sludge

B : Sediment

C : Leachate

D : Floc

Q : 103) The amount of oxygen required for biological decomposition of dissolved organic solids under aerobic conditions for five days at 20 degree Celsius is termed as :

A : Chemical oxygen demand (COD)

B : Biological oxygen demand (BOD)

Q : 104) While testing for COD of sewage, organic matter is oxidized by $K_2Cr_2O_7$ in the presence of

A : HCL

B : H_2SO_4

C : HNO_3

D : None of these

Q : 105) Allowable disposable rate of application of sludge on land is determined by:

A : Carbon content of sludge

B : Potassium content of sludge

C : Nitrogen content of sludge

D : Phosphorous content of sludge

Q : 106) Which of the following tests employ ferroin indicator?

A : Iron

B : Fluoride

C : Chemical oxygen demand

D : Nitrate nitrogen

Q : 107) Sewage may be disposed of without treatment into a water body, if the available dilution is:

A : > 400

B : > 500

C : > 200

D : > 300

Q : 108) The developing of anaerobic conditions due to closing of voids in a soil land due to continuous application of sewage is termed as :

A : Soil sickness

B : Soil damping

C : Bacterial sickness

D : Sewage sickness

Q : 109) A B.O.D test indicates 10 m; waste in 300 ml bottle with an initial BOD of 8 mg/L and final 5-day BOD of 5 mg/L. What will be the 5 day BPD (mg/L)?

A : 300

B : 240

C : 150

D : 90

Q : 110) For determining a 5-day BOD, sewage has been diluted to a ratio of 100. If the contents of the dissolved oxygen at the beginning and end of the test are respectively 15 and 7,5 ppm, the 5-day BOD (mg/l) will be:

A : 150

B : 750

C : 1000

D : 1500

Q : 111) A given sludge with 98% moisture is x times more bulky than with 95% moisture, then x is

A : 3.5

B : 2.5

C : 3

D : 2

Q : 112) Which of the following units works in anaerobic conditions?

A : Sludge digestion tank

B : Sedimentation tank

C : Activated sludge treatment

D : Trickling filters

Q : 113) In DO test, if no oxygen is present, the manganese ions react with hydroxide to form a precipitate of $Mn(OH)_2$, its colour is

A : Brown

B : White

C : Red

D : Black

Q : 114) The Bangalore method of mechanized composing is also known as

A : Aerobic process

B : Anaerobic process

C : Facultative process

D : Mesophilic process

Q : 115) Which one of the following methods can be employed for plastic and rubber waste disposal?

A : Composing

B : Incineration

C : Sanitary landfill

D : Paralysis

Q : 116) Lateral sewer is a :

A : Sewer that receives sewage from many tributaries, serving as an outlet for a large territory

B : Sewer which carry rain water

C : Sewer that conducts waste water from collecting system to the disposal point

D : Sewer which collects sewer directly from the houses

Q : 117) Which of the following methods is not used for the disposal of hospital waste?

A : Incineration

B : Thermal treatment

C : Landfilling

D : Electro pyrolysis

Q : 118 The municipal solid waste does NOT normally include which of the following waste type generated by a community?

A : Industrial waste

B : Institutional waste

C : Demolition waste

D : Municipal services waste

Q : 119) For sewage disposal in a water body without any treatment, the minimum available dilution level should be 1 in:

A : 300

B : 200

C : 150

D : 500

Q : 120) Consider the following statements regarding contact stabilization process:

1. Primary settling tank is not required in some cases.
2. BOD removal occurs in two stages.
3. Aeration volume requirements are approximately 50% of those of a conventional or tapered aeration plant.
4. Returned sludge is aerated for 30 min to 90 min in sludge aeration tank.

Which of the above statements are correct?

A : 1, 2, 3 and 4

B : 1 and 4 only

C : 1, 2 and 3 only

D : 2, 3 and 4 only

Q : 121) What is the order of waste management hierarchy from most to least favored?

A : Prevention-Recycle-Reuse-Disposal

B : Prevention-Reuse-Disposal-Recycle

C : Prevention-Disposal-Reuse-Recycle

D : Prevention-Reuse-Recycle-Disposal

Q : 122) Which of the following chemical parameters are associated with the organic content of water?

1. Biological Oxygen Demand (BOD)
2. Chemical Oxygen Demand (COD)
3. Total Organic Carbon (TOC) and Total Oxygen demand (TOD)

A : 1 and 2 only

B : 1 and 3 only

C : 2 and 3 only

D : 1, 2 and only

Q : 123) Sewage may be disposed off without treatment into the water body if the available dilution is :

A : < 150

B : > 150

C : > 300

D : < 700

Q : 124) The detention period in primary sedimentation in a sewage treatment plant is:

A : 1 to 3 hrs

B : 4 to 8 hrs

C : 8 to 12 hrs

D : 12 to 18 hrs

Q : 125) What value of flow is usually considered for designed sewage treatment units?

A : Minimum

B : Maximum

C : Average

D : Harmonic mean

Q : 126) Which kind of sewage treatment arrangement is ideal for a small colony of about 200 person?

A : Aqua privy

B : Soak well

C : Septic tank

D : Soak pit

Q : 127) Sloughing phenomena is observed in

A : Oxidation pond

B : Activated sludge process

C : Trickling filter

D : Extended aeration process

Q : 128) In a conventional sewage treatment plant employing trickling filters the grit chamber is placed

A : Ahead of primary setting tank

B : Ahead of the trickling filter

C : Ahead the secondary setting tank

D : Following the secondary setting tank

Q : 129) Lower $\left(\frac{F}{M}\right)$ ratio in a conventional activated sludge treatment plant will mean

A : Lower BOD removal

B : Higher BOD removal

C : No effect on BOD removal

D : Sometimes is lower and sometimes higher removal

Q : 130) Why is proportional flow weir provided in a grit chamber?

A : To reduce the suspended solids entering the grit chamber

B : To maintain constant flow velocity in the grit chamber over a certain depth range

C : To maintain constant flow depth in the grit chamber

D : To allow sewage a fresh into the grit chamber

Q : 131) To correct sequence of the sludge digestion steps is :

A : Methanogenesis, acidogenesis, hydrolysis

B : Acidogenesis, methanogenesis, pyrolysis

C : Hydrolysis, acidogenesis, Methanogenesis

D : Hydrolysis, methanogenesis, Acidogenesis

Q : 132) Grit chamber has a detention period of

A : 20 min to 30 min

B : 2 hrs to 4 hrs

C : 45 sec to 90 sec

D : 2 min to 5 min

Q : 133) Sludge volume index of a good sludge range between

A : 10 to 50 ml/gm

B : 50 to 100 ml/gm

C : 100 to 150 ml/gm

D : 150 to 200 ml/gm

Q : 134) The hydraulic loading rate of high rate trickling filter, including recirculation, in m3/m2/day is:

A : 1 – 4

B : 10 – 40

C : 40 – 100

D : 100 – 200

Q : 135) Order 4 solutions in decreasing order of their BOD values?

A : Industrial water > river water > tap water > bottled water

B : Tap water > Bottled water > river water > industrial water

C : Bottled water ? Tap water > river water > industrial water

D : River water > industrial water > tap water > bottled water

Q : 136) COD / BOD ratio of waste water is

A : ½

B : ¾

C : 1

D : More than 1

Q : 137) One liter of sewage, when allowed to settle for 30 minutes gives a sludge volume of 27 cm^3. If the dry weight of this sludge is 3.0 grams, then its sludge volume index will be

A : 9

B : 24

C : 30

D : 81

Q : 138) The two main gases that evolve from and anaerobic sludge digestion tank include:

A : Ammonia and carbon dioxide

B : Methane and hydrogen sulphide

C : Carbon dioxide & methane

D : Ammonia & methane

Q : 139) How can we correct high C/N (Carbon-nitrogen) ratio during compost formation?

A : By adding cellulose

B : By adding dehydrated mud

C : By adding hydrocarbons

D : By adding fructose

Q : 140) The time required for decomposition of materials in windows composting technique

A : 2 – 6 months

B : 1 to 2 weeks

C : 8 months to 1 year

D : Less than one week

Q : 141) In the activated sludge process, sludge volume index is used to decide-

A : Quality of raw sewage

B : Quality of final effluent

C : Recirculation ratio of sludge

D : Rate of aeration

Q : 142) The organic loading in a trickling filter is measure in-

A : m^3/day

B : gm/m^2/day

C : kg/hectare-meter/day

D : kg/hectare/day

Q : 143) The recirculation factor in a low rate trickling filter is-

A : 0

B : 1

C : 10

D : 100

Q : 144) The area of oxidation ponds is determined on the basis of the following approximate rule:

A : 500 persons to one acre of pond area

B : 1000 persons to one acre of pond area

C : 1500 persons to one acre of pond area

D : 2000 persons to one acre of pond area

Q : 145) The two main gases obtained from anaerobic decomposition are-

A : Ammonia and CO_2

B : CO_2 & CH_4

C : CH_4 & Hydrogen sulfide

D : Ammonia and CH_4

Q : 146) Parshall flume is primarily provided in the downstream side of the grit chamber of act as device

A : Oxygenation

B : Velocity control

C : Floating material removal

D : Putrescible material removal

Q : 147) From amongst the following sewage treatment option, largest land requirements for a given discharge will be needed for:

A : Oxidation ditch

B : Oxidation pond

C : Aerobic pond

D : Anerobic pond

Q : 148) The process of lagooning is primarily a means of

A : Increasing the capacity of storage reservoir

B : Reducing the excessive flow in sewer

C : Increasing flow of a sewage through Imhoff

D : Disposal of sludge

Q : 149) Sewage sickness occurs when:

A : Sewage contains pathogenic organisms

B : Sewage enters the water supply system

C : Sewage get clogged due to accumulation of solids

D : Voids of soil get clogged due to continuous application of sewage on a piece of land

Q : 150) The effective process used in purifying emissions from industries like, varnish cooking and asphalt oxidation is :

A : Gravitational settling

B : Catalytic combusting

C : Nuclear fission

D : Catalytic reduction

Q : 151) Settling velocity increases with :

A : Specific gravity of solid particles

B : Size of particles

C : Depth of tank

D : Temperature of liquid

Q : 152) The minimum diameter and depth of a soak pit should be kept respectively as-

A : 2.0 feet and 3 feet

B : 2.5 feet and 4 feet

C : 3.0 feet and 5 feet

D : 3.5 feet and 6 feet

Q : 153) SO_2 and CO adversely affect

A : Oxygen carrying capacity of blood and functioning of lungs respectively

B : Functioning of the respiratory system and brain respectively

C : Functioning of the respiratory system an oxygen carrying of blood respectively

D : Functioning of air passages and chest respectively

Q : 154) Cyclone separations are used for

A : SOx

B : NOx

C : SPM

D : CO

Q : 155) The presence of intolerable levels of carbon monoxide in the air impacts :

A : Eyes

B : Nose

C : Heart

D : Skin

Q : 156) Cyclones are used for cleaning air separation of

A : Many types of dust

B : Fine metallurgical fumes

C : Organic vapors

D : Organic sulphides

Q : 157) The particulate contaminants are removed from the polluted gas stream by incorporating the particulates into liquid droplets are termed as:

A : Electrostatic precipitators

B : Fabric filters

C : Cyclone separators

D : Wet collectors

Q : 158) Which one of the following plume behaviour occurs when atmospheric inversion begins from the ground level and continuous?

A : Looping

B : Fumigation

C : Coning

D : Fanning

Q : 159) The dispersion of pollutants in atmosphere is maximum when

A : Environmental lapse rate is greater than adiabatic lapse rate

B : Environmental lapse rate is less than adiabatic lapse rate

C : Environmental lapse rate is equal to adiabatic lapse rate

D : Maximum mixing depth is equal to zero

Q : 160) Match List-I (pollutants) with List0II (Sources) and select correct answer using codes given below

List-I	List-II
A. Acid water	1. Volcanoes
B. SO_2	2. Automobiles
C. CO	3. Thermal power stations
D. Fly ash	4. Mining

A : 1, 4, 2, 3

B : 4, 1, 2, 3

C : 1, 4, 3, 2

D : 4, 1, 3, 2

Q : 161) Which of the following plume behavior will have the most severe implications on human health?

A : Coning

B : Fanning

C : Trapping

D : Fumigation

Q : 162) Which of the following is a secondary air pollutant?

A : Suspended particulate matter

B : Nitrogen dioxide

C : Ozone

D : Carbon monoxide

Q : 163) Consider the below statements with respect to air pollution control:

A. Dispersion of air pollutants through long chimneys helps in diluting the air pollutants near their source.

B. Dispersion of air pollutants through long chimneys, reduce long term undesirable effects on the community as a whole.

Identify the correct statement/s/

A : Both statements are true

B : Statement A is true B is false

C : Statement B is true A is false

D : Both statements are false

Q : 164) The major constituent gases produced from the land fill site are:

A : Carbon dioxide and methane

B : Carbon monoxide and nitrogen

C : Hydrogen sulphide and oxygen

D : Ammonia and hydrogen

Q : 165) The plume that occurs under strong wind velocity, when the lapse rate is near adiabatic condition (neutral), and the plume touches the ground at greater horizontal distance is:

A : 6 times

B : 2 times

C : 4 times

D : 8 times

Q : 166) High energy input scrubbers will perform efficiently for collection for particles of diameter:

A : 1 – 2 μ

B : 5 – 10 μ

C : 15 – 20 μ

D : 20 – 25 μ

Q : 167) A device used to control the emission of particulate pollutants smaller than 10 micron size, collection and disposal in dry form at low pressure drop is:

A : Baffle type separator

B : Fabric filter

C : Louver type separator

D : Simple gravity settling chambers

Q : 168) When the environmental lapse rate is less than dry adiabatic lapse rate, the rising particle becomes cooler and denser than is surroundings and tends to fall back to its original position. This lapse rate is called _____

A : Super adiabatic lapse rate

B : Sub adiabatic lapse rate

C : Dry adiabatic lapse rate

D : Adiabatic lapse rate

Q : 169) Following are the 4 scenarios given relating the environmental lapse rate (ELR) and dry adiabatic lapse rate (DALR). In which of the case, the mixing height would be the maximum

A : ELR >> DALR

B : ELR = DALR

C : ELR << DALR

D : ELR = 0.75 × DALR

Q : 170) The maximum annual average concentration to total suspended particulate matter as per National ambient air quality standard is:

A : 78 $\mu g/m^3$

B : 140 $\mu g/m^3$

C : 250 $\mu g/m^3$

D : 55 $\mu g/m^3$

Q : 171) Consider the following air pollutants:

1. NO_x
2. PAN
2. CO_2
3. CO

Which of the above air pollutants is/are present in an auto exhaust gas?

A : 1 only

B : 1 and 2

C : 2 and 3

D : 1, 3 and 4

Q : 172) When the adiabatic lapse rate (ALR) is more than environmental lapse rates (ELR), then the ELR can be called as

A : Super adiabatic lapse rate

B : Sub adiabatic lapse rate

C : Dry adiabatic lapse rate

D : Wet adiabatic rate

Result : SSC JE 2019

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