1. Surge tanks are used

   A. for storage water

   B. to increase the velocity in a pipeline

   C. as overflow valves

   D. to guard against water hammer.

   Answer: Option **D**

---

2. As per IS : 1172-1963, water required per head per day for average domestic purposes, is

   A. 50 litres

   B. 65 litres

   C. 85 litres

   D. 105 litres

   E. 135 litres.

   Answer: Option **E**

---

3. In slow sland filters, the turbidity of raw water can be removed only up to

   A. 60 mg/litre

   B. 75 mg/litre

   C. 100 gm/litre

   D. 150 mg/litre.

   Answer: Option **A**

---

4. Biochemical Oxygen Demand (B.O.D.) of safe drinking water must be

   A. nil

   B. 5

   C. 10

   D. 15

   E. 20

   Answer: Option **A**

---

5. Acidity in water is caused due to

   A. Mineral acids

   B. Free CO_2

   C. Iron sulphate

   D. Aluminium sulphate

   E. All the above.

   Answer: Option **E**

6. The transitional middle portion of a logistic curve follows

   A. a geometric growth

B. a logarithmic growth

C. a first over curve

D. a constant rate.

Answer: Option **D**

---

7. Pick up the correct statement from the following :

A. Excess quantities of iron and manganese in water, cause discolouration of clothes

B. Lead and barium salts have toxic effect

C. Arsenic and selenium are poisonous to human health

D. Higher copper content affects the lungs

E. All the above.

Answer: Option **E**

---

8. Pick up the incorrect statement from the following regarding fire hydrants

A. Fire hydrants are fitted in water mains at 100 m to 150 m apart at fire

B. The minimum water pressure hydrants, is kept 1.5 kg/cm^2

C. The water at pressure 1 to 1.5 kg/cm^2 is made available for 4 to 5 hours for constant use

D. None of these.

Answer: Option **D**

---

9. The specific retention is least in case of

A. Clay

B. Sand

C. Silt

D. Coarse gravel.

Answer: Option **D**

---

10. B.O.D. of treated water should be

A. 10 ppm

B. 25 ppm

C. 20 ppm

D. 30 ppm

E. Nil.

Answer: Option **E**

11. Most commonly used pump for lifting water in water supply mains, is

A. axialflow pump

B. reciprocating pump

C. rotary type pump

D. centrifugal pumps

E. none of these.

Answer: Option **A**

---

12. Economic height of a dam is the height corresponding to which

A. cost of the dam per unit of storage is minimum

B. amount of silting is less

C. cost of dam per unit storage is maximum

D. free board provided is least

E. none of these.

Answer: Option **A**

---

13. Distribution mains of any water supply, is normally designed for its average daily requirement

A. 100%

B. 150%

C. 200%

D. 225%.

Answer: Option **D**

---

14. If pH value of water is

A. 7 water it is said to be neutral

B. less than 7 it is said to be acidic

C. more than 7 it is said to be alkaline

D. all the above.

Answer: Option **D**

---

15. In pressure supply mains, water hammer pressure is reduced by providing

A. sluice valves

B. air valves

C. pressure relief valves

D. none of the these.

Answer: Option **C**

16. P_0, P_1, P_2 be the populations of a city at times t_0, t_1 and $t_2 = 2t_1$, the saturation value of the population P_s of the city, is

A. $$P_s = \frac{2P_0P_1P_2 - P_1^2(P_0 + P_2)}{P_0P_2 - P_1^2}$$

B. $$P_s = \frac{2P_0P_1P_2 - P_2^2(P_0 + P_1)}{P_0P^2 - P_1^2}$$

C. $$P_s = \frac{P_0P_1P_2 - P_2^2(P_0 + P_1)}{P_0P_2 - P_1^2}$$

D. $P_s = \frac{P_0P_1P_2 + P_2^2(P_0 + P_1)}{P_0P_2 - P_1^2}$

E. None of these.

Answer: Option **A**

---

17. Water supply system includes

A. digging a well for water

B. construction of dams

C. construction of canals

D. entire arrangement from source to distribution.

Answer: Option **D**

---

18. Corrosion of a pipe

A. reduces its life span

B. reduces its carrying capacity

C. adds colour to water

D. adds odour to water

E. all the above.

Answer: Option **E**

---

19. Most satisfactory formula for an estimate of fire demand Q for a city of population P in thousands for Indian conditions, is

A. $Q = 1115\left(\frac{P}{5} + 20\right)$

B. $Q = 1640\,P\,(1 - 0.01\,P)$

C. $Q = 3180\,P$

D. none of these.

Answer: Option **C**

---

20. Pick up the correct statement from the following :

A. Detention period for plain sedimentation tanks ranges between 4 to 8 hours

B. Detention period for sedimentation tanks, using coagulants usually ranges between 2 to 4 hours

C. The horizontally flow velocity in sedimentation tanks, is generally limited to 0.3 m/minute

D. All the above.

Answer: Option **D**

21. According to Kuichling's formula, fire demand in litres per minute for a population of P thousands, is

A. $3182\,P$

B. $1136.5\left[\frac{P}{10} + 10\right]$

C. 4637 *P* [1 - 0.01 *P*]

D. 5663 *P*.

Answer: Option **A**

---

22. The maximum permissible nitrites in public water supplies, is

A. Nil

B. 0.5 P.P.M.

C. 1.0. P.P.M.

D. 1.5 P.P.M.

E. 200 P.P.M.

Answer: Option **A**

---

23. A high velocity of wash water is required for

A. rapid gravity filter with strainers

B. rapid gravity filter without strainers

C. slow sand filter with strainers

D. slow sand filter without strainers

E. none of these.

Answer: Option **B**

---

24. In distribution pipes, drain valves are provided at

A. lower point

B. higher point

C. junction points

D. any where.

Answer: Option **A**

---

25. Corrosion of well pipes may not be reduced by

A. reducing the draw down and the pumping rate

B. reducing the flow velocity

C. using thicker pipes

D. using screens having larger area of openings

E. none of these.

Answer: Option **D**

6. Manholes along the mains from the source to a city are provided at 500 m intervals in

A. steel pipes

B. R.C.C. pipes

C. hume steel pipes

D. all the above.

Answer: Option **D**

---

27. The population growth curve is

A. *S*-shaped curve

B. parabolic curve

C. circular curve

D. straight line

E. none of these.

Answer: Option **A**

---

28. Turbidity of raw water is a measure of

A. suspended solids

B. acidity of water

C. B.O.D.

D. none of these.

Answer: Option **A**

---

29. If V is total consumption of water in litres for a population of N individuals, per capita consumption or water allowance for the water supply Q, is given by

A. $Q = \frac{V}{12\,N}$

B. $Q = \frac{V}{24\,N}$

C. $Q = \frac{V}{365\,N}$

D. none of these.

Answer: Option **C**

---

30. Water supply includes

A. collection, transportation and treatment of water

B. distribution of water to consumers

C. provision of hydrants for fire fighting

D. mains, sub-mains and branch lines of water supply

E. all the above.

Answer: Option **E**

31. Asbestos pipes are

A. light in weight and easy to transport

B. highly resistant to corrosion

C. high flexible to accommodate deflection upto 12°

D. very much smooth and hydraulically efficient

E. all the above.

Answer: Option **E**

---

32. The maximum depth of sedimentation tanks is limited to

A. 2 m

B. 3 m

C. 4 m

D. 5 m

E. 6 m.

Answer: Option **E**

---

33. By boiling water, hardness can be removed if it is due to

A. calcium sulphate

B. magnesium sulphate

C. calcium nitrate

D. calcium bicarbonate

E. none of these.

Answer: Option **D**

---

34. *Q* is the discharge from an unconfined tube well with depression head *s* through its pipe of radius *rw*. If the radius of influence is *R*, the length of the required strainer, is

A. $2.3Q \log_{10} \left(\frac{R}{rw}\right)^2$

B. $2.3 \log_e \left(\frac{R}{rw}\right)^2$

C. $\frac{2.3 \log_e \frac{R}{rw}}{2\pi Ks}$

D. $\frac{2.3Q \log_{10} \frac{R}{rw}}{2\pi Ks}$

Answer: Option **C**

---

35. For determining the velocity of flow of underground water, the most commonly used non-empirical formula is

A. Darcy's formula

B. Slichter's formula

C. Hazen's formula

D. Lacy's formula.

Answer: Option **A**

36. The least thickness of class B cast iron (spun) pipe, is

A. 7.2 mm

B. 7.9 mm

C. 8.6 mm

D. 10 mm.

Answer: Option **C**

---

37. According to IS : 1172-1963, a minimum of 135 litres of water capita per day, is required for

A. Boarding schools

B. Nurses home and medical quarters

C. hostels

D. all the above.

Answer: Option **D**

---

38. The R.L. of ground water table on the sides of a valley is 1505 m whereas R.L. of the stream water is 1475 m. If 60° slope consists of pervious soil between R.L. 1485 m to 1500 m, the gravity spring may be expected at the point of reduced level

A. 1500 m

B. 1505 m

C. 1475 m

D. 1485 m.

Answer: Option **D**

---

39. The factor affecting per capita demand, is

A. size of the city

B. climatic conditions

C. pressure in water mains

D. cost of water

E. all the above.

Answer: Option **E**

---

40. Pick up the incorrect statement from the following. The underground sources of water, is from

A. wells

B. springs

C. infiltration wells

D. storage reservoirs

E. none of these.

Answer: Option **D**

41. Disinfection of drinking water, is done to remove

A. odour

B. bacterias

C. turbidity

D. colour.

Answer: Option **B**

---

42. Sunlight

A. helps growth of bacterias

B. impedes growth of algae

C. increases dissolved oxygen content

D. reduces turbidity.

Answer: Option **B**

---

43. The expected discharge to be obtained from an open well sunk in coarse sand is 0.0059 cumec. If the working depression head of the well is 3 m, the minimum diameter of the well, is

A. 2 m

B. 2.25 m

C. 2.50 m

D. 2.75 m

E. 3.00 m.

Answer: Option **E**

---

44. Average annual rainfall at any station is the average of annual rainfall over a period of

A. 7 years

B. 14 years

C. 21 years

D. 28 years

E. 35 years.

Answer: Option **E**

---

45. Time of concentration

A. is the time taken, for precipitation

B. duration of rainfall.

C. time taken for all the ran off to reach the drain

D. time taken for the storm water to travel from the most remote point to the drain.

Answer: Option **D**

6. If four fires break out in a city of population 40 lakhs and if each hydrant has three streams and duration of each fire is four hours, the total quantity of water required, is

A. 1880 kilo litres

B. 2880 kilo litres

C. 3880 kilo litres

D. 4880 kilo litres.

Answer: Option **B**

---

47. The fire demand of a city may be worked out by

A. Kuichling's formula

B. Freeman formula

C. Under Writers formula

D. Bustan's formula

E. All the above.

Answer: Option **E**

---

48. Aeration of water is done to remove

A. odour

B. colour

C. bacterias

D. hardness

E. turbidity.

Answer: Option **A**

---

49. The yield of a rapid gravity filter as compared to that of slow sand filter, is

A. 10 times

B. 15 times

C. 20 times

D. 30 times

E. 35 times.

Answer: Option **D**

Section 2

1. While determining the yield of open wells by the pumping test

A. velocity of recharging water, increases with depression head

B. depression head resulting at critical velocity, is called critical depression head

C. working head is generally limited to $\frac{1}{3}$ rd of the critical depression head

D. maximum safe yield of an open well, is expected at critical depression head.

Answer: Option **D**

---

2. Increase in population of a rapidly growing city, may be estimated by

A. arithmetical mean method

B. geometrical method

C. incremental increase method

D. graphical comparison method.

Answer: Option **B**

---

3. Pick up the correct statement from the following regarding the pressure conduits :

A. Pressure conduits are permitted to run $\frac{3}{4}$ th full

B. Pressure conduits are always laid along down grades

C. The hydraulic gradient line always coincides the invert of the conduit

D. None of these.

Answer: Option **D**

---

4. The standard B.O.D. at 20&Deg;C, is taken for the consumption in

A. one day

B. 2 days

C. 3 days

D. 4 days

E. 5 days.

Answer: Option **E**

---

5. The superimposed load transmitted to the pipe, is generally evaluated by Bousiness formula

A. $Pt = \frac{3\ H^3 P}{2\pi Z}$

B. $Pt = \frac{3\ H^3 P}{2\pi Z^5}$

C. $Pt = \frac{3\ H^3 P}{2\pi Z^2}$

D. $Pt = \frac{3\ H^3 P^2}{2\pi Z^3}$

Answer: Option **B**

6. Percussion drilling is unsuitable in

A. unconsolidated sand

B. unconsolidated gravel

C. quick sand

D. consolidated rocks.

Answer: Option **D**

---

7. Disinfection of water with ozone is not good because

A. it vanishes before water reaches the consumers

B. it removes the colour, taste and odour from water as bacterias

C. it adds taste to the water

D. it is more efficient than chlorine in killing bacterias

E. none of these.

Answer: Option **D**

---

8. An earth formation which, although porous and capable of absoring water does not provide an appreciable supply to wells, is known as

A. acquifer

B. aquiclude

C. aquifuge

D. none of these.

Answer: Option **B**

---

9. Mathamoglobinemia, or blue baby disease is caused due to

A. chlorides

B. nitrites

C. nitrates

D. sulphides.

Answer: Option **C**

---

10. The main process to purify water by filtration, is

A. mechanical straining

B. flocculation and sedimentation

C. biological metabolism

D. electronic change

E. all the above.

Answer: Option **E**

11. Pick up the correct statement from the following :

A. The internal pressure within a pipe, is caused due to water head and hammer pressure

B. The internal pressure in a pipe running full is equal to vertical ordinate between hydraulic gradient line and centre of the pipe

C. In pressure pipes with water at rest, the pressure is equal to water head

D. Sudden closure of a valve, causes the water hammer pressure

E. All the above.

Answer: Option **E**

---

12. Surface water is obtained from

A. well

B. springs

C. artesian well

D. rain.

Answer: Option **D**

---

13. Hardness of water is caused due to

A. calcium sulphate

B. magnesium sulphate

C. calcium nitrates

D. calcium bicarbonates

E. all the above.

Answer: Option **E**

---

14. Flow through period, in sedimentation tanks, is

A. equal to detention period

B. more than detention period

C. less than detention period

D. detention period divided by displacement efficiency

E. none of these.

Answer: Option **C**

---

15. Normal values of overflow rate for plain sedimentation tank, is

A. 250 to 500 litres/hr/m^2

B. 500 to 750 litres/hr/m^2

C. 750 to 1000 litres/hr/m^2

D. 1000 to 1250 litres/hr/m^2.

Answer: Option **B**

16. If *p* is total internal pressure, *d* is diameter of pressure conduit and *t* is thickness of conduit, the Hoop's stress is

A. $\frac{\pi dp}{t}$

B. $\frac{\pi dp}{2t}$

C. $\frac{dp}{2t}$

D. $\frac{dt}{2p}$

Answer: Option **C**

---

17. The force which develops in a pressure conduit supported on trestles, is

A. tension

B. compression

C. temperature stress

D. flexural stress.

Answer: Option **D**

---

18. After cleaning a slow sand filter, the filtered water is not used for

A. 6 hours to 12 hours

B. 12 hours to 18 hours

C. 18 hours to 24 hours

D. 24 hours to 36 hours

E. 48 hours.

Answer: Option **D**

---

19. A pressure conduit laid under ground, may not be subjected to

A. internal pressure of water

B. pressure due to external load

C. longitudinal temperature stress

D. longitudinal stresses due to unbalanced pressure to bends

E. none of these.

Answer: Option **C**

---

20. The period of cleaning of a slow sand filter, is usually

A. 5 to 10 days

B. two weeks to three weeks

C. one month to three months

D. three months to six months

E. one year.

Answer: Option **C**

21. At the socket and spigot joint,

A. enlarged end of the pipe is called socket

B. normal end of the pipe is called spigot

C. spigot is fitted into the socket

D. molten lead is used for water proofing

E. all the above.

Answer: Option **E**

---

22. Gravity conduits for carrying water from the source are

A. canals

B. flumes

C. acqueducts

D. all the above.

Answer: Option **D**

---

23. Continuous flow of water can be expected from

A. gravity springs

B. surface springs

C. artesian springs

D. none of these.

Answer: Option **C**

---

24. The maximum hourly consumption, is generally taken as

A. 110%

B. 120%

C. 130%

D. 140%

E. 150%.

Answer: Option **E**

---

25. A city supply includes

A. domestic water demand

B. industrial and commercial water demands

C. demand for public uses and fire

D. water losses

E. all the above.

Answer: Option **E**

26. During treatment of water, sedimentation is done

A. before filtration

B. after filtration

C. simultaneously with filtration

D. along with chlorination.

Answer: Option **A**

---

27. E. Coli bacterias die in water having pH greater than

A. 5.5

B. 6.5

C. 7.5

D. 8.5

E. 9.5

Answer: Option **E**

---

28. Check valves are installed

A. on the delivery side of the pumping set

B. at the interconnections between polluted water system and a potable water system

C. both (a) and (b)

D. neither (a) nor (b).

Answer: Option **C**

---

29. The equation $0.368\left[\frac{P}{1.87+32}\right]\left[\frac{H}{\sqrt{A}}\right]^{0.155}$ in which Q is yearly run off in cm, P is yearly total rainfall in cm, H is difference of R.L.s. of lowest and highest points and A is area of catchment in square metres, is known as

A. English formula

B. Khosla's formula

C. Justin's formula

D. Vermule's formula.

Answer: Option **C**

---

30. If intensity of rainfall in cm per hour is I, percentage coefficient of run-off is P, area of catchment in square kilometres is A, the total run-off Q, is given by

A. $Q = 1.758 \times 10^2 \times API$

B. $Q = 2.758 \times 10^2 \times API$

C. $Q = 2.758 \times 10^3 \times API$

D. $Q = 1.758 \times 10^2 \times \frac{AI}{P}$

E. $Q = 2.758 \times 10^2 \times \frac{AP}{I}$

Answer: Option **C**

31. Hard water contains

A. calcium

B. magnesium bicarbonates

C. magnesium sulphate

D. all the above.

Answer: Option **D**

---

32. The main disadvantage of hard water, is

A. greater soap consumption

B. scaling of boilers

C. corrosion and incrustation of pipes

D. making food tasteless

E. all the above.

Answer: Option **E**

---

33. An area is declared drought affected if its mean rainfall is less than

A. 50%

B. 60%

C. 75%

D. 80%

E. 85%.

Answer: Option **E**

---

34. The best quality of filter material is obtained from quartzite if it does not loose weight when placed in hydro-chloric acid for 24 hours, more than

A. 5%

B. 8%

C. 10%

D. 12%

E. 15%.

Answer: Option **A**

---

35. If discharge of a pump is 0.16 cumecs, the economic diameter of pipe, is

A. 0.488 m

B. 4.88 cm

C. 0.488 cm

D. 4.88 m

E. none of these.

Answer: Option **A**

36. Hard water for public water supply is discarded because

A. it consumes more soap

B. it contains lot of turbidity

C. it contains pathogenic bacterias

D. it possesses bad taste and odour

E. none of these.

Answer: Option **A**

---

37. Pick up the correct statement from the following regarding radial flow centrifugal pumps :

A. These are provided with volute type or turbine type casings

B. In involute type of radial flow centrifugal pump, the impeller discharges into a gradually expanding spiral casing

C. In turbine type of radial flow centrifugal pumps, the impeller is surrounded by stationary guide vanes to reduce the velocity of water

D. The efficiency of turbine type of radial flow centrifugal pump, is always higher than that of volute type

E. All the above.

Answer: Option **E**

38. Quality of water is said to be good if it is

A. free from suspended matter

B. colourless

C. free from pathogenic organism

D. tasteless

E. all the above.

Answer: Option **E**

---

39. Pick up the incorrect statement from the following :

A. An impervious layer a few metres below the water table in the sub-soil, is generally called Mota layer (6) Mota layer is very useful to give structural support to open deep wells

B. A bore hole is generally provided in the mota layer for deep wells

C. Shallow wells are always of less depth as compared to deep wells

D. None of these.

Answer: Option **D**

---

40. The main draw-back of centrifugal pump, is

A. necessity of priming

B. discharge from pump varies with the load of water

C. for high heads, efficiency is low up to 50%

D. the suction lift is limited to 6 m

E. all the above.

Answer: Option **E**

41. The water level in an open well was depressed by pumping 2.5 m and recuperated 2.87 m in 3 hours and 50 minutes. The yield of the well per minute is

A. 0.0033

B. 0.0044

C. 0.0055

D. 0.0066

Answer: Option **C**

---

42. Rapid gravity filter can only remove turbidity of water upto

A. 15 to 25 gm/litre

B. 25 to 30 gm/litre

C. 30 to 35 cm/litre

D. 35 to 40 gm/litre

E. 50 gm/litre.

Answer: Option **D**

---

43. Pick up the correct statement from the following :

A. The amount of rainfall in 24 hours, is known as daily rainfall

B. The amount of rainfall in one year, is known as annual rainfall

C. The rain cycle period in India is taken as 35 years

D. The ratio of the actual rainfall in the year to the normal rainfall at a place, is called index of the wetness

E. All the above.

Answer: Option **E**

---

44. The best process of disinfection of public water supply, is by

A. boiling

B. chlorination

C. adding lime

D. adding zone.

Answer: Option **B**

---

45. Pick up the correct statement from the following :

A. A hydrograph is a plot of discharge versus time

B. A mass curve is a plot of accumulated flow versus time

C. The mass curve continuously rises

D. The slope of the mass curve at any time is a measure of the inflow rate at that time

E. All the above.

Answer: Option **E**

46. A water channel supported above the ground over trestles, is generally called

A. flume

B. canal

C. adueduct

D. tunnel

E. all the above.

Answer: Option **A**

---

47. If *d* is the diameter of the pipe, *p* is the total internal pressure, *f* is the permissible tensile stress and *n* is the effective of the joint, the thickness *t* of metal pipe, is

A. $\eta \frac{pd}{2f}$

B. $\frac{1}{\eta} \frac{pd}{2f}$

C. $\frac{1}{\eta} \frac{pd}{3f}$

D. $\frac{1}{\eta} \frac{pf}{d}$

E. none of these.

Answer: Option **B**

---

48. One degree of hardness of water means a content of salts of

A. 10.25 mg/litre

B. 12.25 mg/litre

C. 14.25 mg/litre

D. 16.25 mg/litre.

E. 20 mg/litre.

Answer: Option **C**

---

49. Mostly used coagulant, is

A. chlorine

B. alum

C. lime

D. bleaching powder.

Answer: Option **B**

---

50. If G is the specific gravity of particles of diameter d, the velocity of settlement V in still water at T°C, according to Stoke's law, is

A. $V = 418\ (G - 1)\ d^2 \left(\frac{3T + 70}{100}\right)$

B. $V = 418\ (1 - G)\ d \left(\frac{3T - 70}{100}\right)$

C. $V = 418\ (1 - G)\ d^2 \left(\frac{2T + 70}{100}\right)$

D. $V = 418\ (G - 1)\ d^3 \left(\frac{3T + 70}{100}\right)$

E. none of these.

Answer: Option **A**

Section 3

1. The most commonly used chemical for dechlorination of water, is

A. sodium thiosulphate

B. sodium bisulphate

C. sodium sulphite

D. sulphur-dioxide

E. all the above.

Answer: Option **C**

---

2. The prescribed hardness limit of potable water ranges between

   A. 50 to 75 P.P.M.

   B. 75 to 115 P.P.M.

   C. 100 to 150 P.P.M.

   D. 150 to 200 P.P.M.

   E. none of these.

   Answer: Option **B**

---

3. For centrifugal pumps

   A. initial cost is low

   B. limited space is required

   C. the discharge obtained is steady and non-pulsating

   D. all the above.

   Answer: Option **D**

---

4. The cast iron pipes for water supply system are used for

   A. durability

   B. strength

   C. easy connection

   D. low maintenance cost

   E. all the above.

   Answer: Option **E**

---

5. For plain chlorination of water, the quantity of chlorine used, is

   A. 0.1 mg/litre

   B. 0.2 mg/litre

   C. 0.3 mg/litre

   D. 0.4 mg/litre

   E. 0.5 mg/litre.

   Answer: Option **E**

6. For estimating the run off of catchments, the mean value of the constant '*K*' in the Khosla's formula $Q_y = P_y - K\,(1.8\,T_y + 32)$ is

   A. 1.21

   B. 1.23

   C. 1.25

   D. 1.27

   E. 1.31

   Answer: Option **D**

---

7. Service connections to consumers houses, are generally provided with

A. copper pipes

B. hume pipes

C. galvanised iron pipes

D. P.V.C. pipes

E. none of these.

Answer: Option **C**

---

8. Sluice valves are fitted in a distribution system

A. along straight length of pipes at suitable intervals

B. at the junctions of the pipes

C. at the branching off points of sub-mains

D. all the above.

Answer: Option **D**

---

9. The detention period for plain sedimentation water tanks, is usually

A. 4 to 8 hours

B. 8 to 16 hours

C. 16 to 24 hours

D. 24 to 36 hours.

Answer: Option **D**

---

10. The maximum permitted loss of head in a rapid sand filter, is

A. 1 m

B. 2 m

C. 3 m

D. 4 m

E. 5 m.

Answer: Option **C**

11. Mud balls may be removed by

A. breaking and washing

B. washing the filter with a solution of caustic soda

C. removing, cleaning and replacing the damaged sand

D. all the above.

Answer: Option **D**

---

12. For maximum alkalinity of water, pH value should be

A. zero

B. less than 7

C. more than 7

D. 14

E. 21

Answer: Option **D**

---

13. The fire demand for a city of 50, 000 population, according to Godrich formula, is

A. 40 mld

B. 42 mld

C. 44 mld

D. 48 mld.

Answer: Option **C**

---

14. The efficiency of sedimentation tank does not depend upon

A. depth of tank

B. length of tank

C. detention period

D. velocity of water.

Answer: Option **A**

---

15. When the reduced level of the water source is higher than the reduced level of the consumer's place, water is generally supplied

A. by pumping system

B. by gravitational system

C. both (a) and (b)

D. all the above.

Answer: Option **B**

16. Most commonly used section in grade aqueducts, is

A. circular

B. rectangular

C. parabolic

D. horse shoe section.

Answer: Option **B**

---

17. Pressure exerted at 90° bend in a pipe of cross-sectional area A and carrying water with a velocity V under a pressure p, is

A. $\left[pA + \frac{w}{g} AV\right]$

B. $2\left[pA + \frac{w}{g} AV^2\right]$

C. $\sqrt{2}\left[pA + \frac{w}{g} AV^2\right]$

D. $\sqrt{3}\left[pA + \frac{w}{g}A^2v\right]$

Answer: Option **C**

---

18. The lowest outlet sluice in a dam is provided

A. below the dead storage

B. on the top level of dead storage

C. on the top level of useful storage

D. at the centre of the dam.

Answer: Option **B**

---

19. The four major water supply distribution systems, are

A. dead end, tree, grid iron and reticulation

B. dead end, tree, grid iron and circular

C. tree, grid iron, ring and radial

D. tree, reticulation, circular and ring.

Answer: Option **C**

---

20. Most important source of water for public water supply, is from

A. lakes

B. ponds

C. streams

D. rivers

E. sea.

Answer: Option **D**

21. In pumping stations, the type of joint generally used, is

A. socket and spigot joint

B. flanged joint

C. expansion joint

D. dresser coupling joint

E. flexible joint.

Answer: Option **B**

---

22. The permissible pH value for public water supplies may range between

A. 4.5 to 5.5

B. 5.5 to 6.5

C. 6.5 to 8.5

D. 8.5 to 10.5

E. none of these.

Answer: Option **C**

---

23. The strainer type tube well, is unsuitable for

A. coarse gravels

B. fine sandy strata

C. clean gravels

D. none of these.

Answer: Option **B**

---

24. Pick up the correct statement from the following :

A. Lime may be used to soften the hard water

B. Excessive use of lime may kill the bacterias

C. Excessive lime when added to water, raises its pH value

D. When lime raises pH value of water to about 9.5, 100% bacterias are removed

E. All the above.

Answer: Option **E**

---

25. Specific capacity or yield of wells, is generally expressed, as

A. m^3 per sec

B. m^3/hour

C. m^3/hour/m^2

D. m^3/hour/m^2/m

E. m^3/hour/m^2/sec.

Answer: Option **D**

26. The depth of the water table at a place is 45 m below the general ground level. To lift water from a deep tube well in such a locality, the type of pump to be installed is

A. Centrifugal pump

B. Reciprocating pump

C. Deep well turbine pump

D. None of these.

Answer: Option **C**

---

27. Critical time for developing a water hammer, is the time required for

A. closing the valve

B. the wave to travel from valve to the reservoir

C. the wave to travel from the valve to the reservoir and back

D. none of these.

Answer: Option **C**

---

28. According to Buston's formula, fire demand in litres per minute for a population of *P* thousands, is

A. 3182 *P*

B. $1136.5\left(\frac{P}{10}+10\right)$

C. 4637 *P* (1 - 0.01 *P*)

D. 5663 *P*

E. none of these.

Answer: Option **D**

---

29. The ratio of maximum hourly consumption and average hourly consumption of the maximum day, is

A. 1.2

B. 1.5

C. 1.8

D. 2.4

E. 2.7

Answer: Option **E**

---

30. Cast iron pipes are generally preferred to, because

A. of moderate cost

B. of ease to join

C. of durability

D. of longer life

E. all the above.

Answer: Option **E**

31. The fire demand for ascertaining the empirical formula $1136.5\left[\frac{P}{10}+10\right]$ known as

A. Kuichling's formula

B. Buston's formula

C. Freeman formula

D. Under Writers formula

E. None of these.

Answer: Option **C**

---

32. To detect the turbidity of the order of 0 to 1000 P.P.M. the instrument used is

A. turbidimeter

B. Jackson turbidimeter

C. Baylis turbidimeter

D. Hallige turbidimeter.

Answer: Option **C**

33. Standard process of chlorination of water, is done by

A. plain chlorination

B. pre-chlorination

C. post-chlorination

D. double chlorination.

Answer: Option **C**

34. If the chosen diameter of a pipe, is less than the economical diameter

A. cost of pipe will be less

B. head loss will be high

C. cost of pumping will be more than saving

D. all the above.

Answer: Option **D**

35. Water gets evaporated from water surfaces and land surfaces, get converted into water drops at lower temperatures, flows over ground surface and finally meets its source, i.e. lake, sea, etc. This entire process is generally known as

A. hydrological cycle

B. water cycle

C. evaporation and precipitation cycle

D. all the above.

Answer: Option **D**

36. In the equation $P = \frac{P_s}{1 + m \log_e^{-1}(nt)}$ of a logistic curve of population growth, the constant m is

A. $P_s \times P$

B. $\frac{P_s}{P}$

C. $\frac{P_s - P_o}{P_o}$

D. KP_s .

Answer: Option **C**

37. High pH value of water does not produce

A. incrustation

B. sediment deposits

C. turberculation

D. corrosion

E. both (c) and (d).

Answer: Option **E**

38. Distribution of wash water is provided in

A. sedimentation tank

B. slow sand filter

C. rapid gravity filter

D. all the above.

Answer: Option **C**

---

39. The valves provided at low points of pipes to drain off water quickly under gravity, are called

A. blow off valves

B. drain valves

C. sewer valves

D. all the above.

Answer: Option **D**

---

40. Pick up the incorrect statement from the following :

A. Free surface ground water is subjected to atmospheric pressure

B. Water table surface rises and falls with seasons

C. Depth of water table is directly proportional to the rate of drawal of water

D. Level of water table remains stationary

E. None of these.

Answer: Option **D**

41. The bacterias which require free oxygen for their survival, are called

A. Aerobic bacterias

B. Anaerobic bacterias

C. Faculative bacteria

D. None of these.

Answer: Option **A**

---

42. Maximum threshold number permitted for indicating the odour of public water supplies, is

A. 1

B. 2

C. 3

D. 4

E. 5

Answer: Option **C**

---

43. 45 litres of water per person per day, is provided in

A. office buildings

B. hotels

C. hostels

D. nurse's homes.

Answer: Option **A**

---

44. Turbidity of water may be caused due to

A. Suspended clay

B. Suspended silt

C. finely divided organic material

D. all the above.

Answer: Option **D**

---

45. Pick up the correct statement from the following :

A. Water with hardness upto 75 ppm is considered soft

B. Water with hardness more than 200 ppm is considered hard

C. Water needed for laundaries should contain hardness less than 75 ppm

D. To provide taste during drinking, water should possess hardness between 75 to 120

E. All the above.

Answer: Option **E**

46. The maximum pressure to which cast iron pipes may be subjected to, is

A. 3 kg/cm^2

B. 5 kg/cm^2

C. 7 kg/cm^2

D. 10 kg/cm^2.

Answer: Option **C**

---

47. The type of pipe commonly used in water supply distribution schemes, is

A. R.C.C. pipes

B. Hume pipes

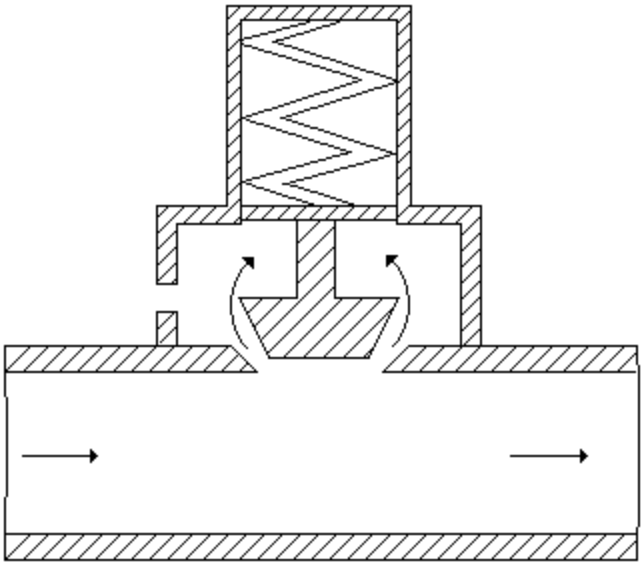
C. Cast iron pipes

D. G.I. pipes.

Answer: Option **C**

---

48. The valve shown in the below figure, is generally known as



A. air valve

B. pressure relief valve

C. sluice valve

D. none of these.

Answer: Option **B**

---

49. The population of a city in 2000 is 50, 000. The average per decade of the previous records of population is 5000 and average percentage per decade is 20%. The population of the city based on geometrical increase method, in the year 2020 will be

A. 56, 000

B. 60, 000

C. 64, 000

D. 70, 000

E. 72, 000

Answer: Option **E**

Section 4

1. Pick up the correct statement from the following :

A. For determination of small colour intensities, tintometer is generally used

B. The odour of water sample is generally measured by a term called odour intensity

C. The colour of water sample may be detected by Nessler tube

D. Specific conductivity of water measures the amount of dissolved salt

E. All the above.

Answer: Option **E**

---

2. Before constructing a dam, the factor to be considered for controlling sedimentation, is

A. selection of dam site

B. construction of check dams

C. providing vegetation screens

D. providing under-sluices in the dam

E. All the above.

Answer: Option **E**

---

3. The process of passing water through beds of granular materials, is called

A. screening

B. sedimentation

C. filtration

D. none of these.

Answer: Option **C**

---

4. If *Q* is discharge is cubicmetres per sec and *D* is the economical diameter of the pipe. According to Lea

A. $D = 0.67$ to $0.87\ Q$

B. $D = 0.77$ to $0.97\ Q$

C. $D = 0.97$ to $1.22\ Q$

D. $D = 1.22$ to $1.33\ Q$.

Answer: Option **C**

---

5. Water to the consumers may be supplied from

A. infiltration galleries connected to sump well

B. infiltration well dug out on the banks of rivers

C. ranney wells sunk to the water level

D. all the above.

Answer: Option **D**

6. If the average daily demand of a city of 50, 000 population, is 20 m.l.d., the maximum daily demand is

A. 24 mld

B. 30 mld

C. 36 mld

D. 54 mld.

Answer: Option **C**

---

7. Recuperation test is carried out to determine

A. turbidity of water

B. pH value of water

C. yield of well

D. discharge from a well.

Answer: Option **C**

---

8. The discharge $Q = \frac{2\pi KHS}{2.3 \log_{10} \frac{R}{rw}}$ for the confined tube well is obtained from

A. Thiem's formula

B. Darcy's formula

C. Tolman's formula

D. Dupuits formula.

Answer: Option **D**

---

9. Pick up the correct statement from the following :

A. Air lift pumps are generally used for pumping water from deep wells

B. Jet pumps are generally used for pumping water from small wells

C. The hydraulic ram works on the principle of water hammer

D. Rotary pumps are provided cams which rotate in opposite direction

E. all the above.

Answer: Option **E**

---

10. Turbidity of water is expressed

A. in ppm

B. in numbers in an arbitrary scale

C. by pH value

D. by colour code.

Answer: Option **A**

11. The ratio of the maximum daily consumption to the average daily demand, is

A. 1.0

B. 1.2

C. 1.4

D. 1.6

E. 1.8

Answer: Option **E**

---

12. The ratio of discharge and plan area of a continuous flow type settling tank, is known

A. surface loading

B. overflow

C. overflow rate

D. all the above.

Answer: Option **D**

---

13. Pick up the correct statement from the following :

A. At a particular speed of operation, the head produced decreases with the increase of discharge

B. At zero discharge, discharge valve remaining closed, the head developed is maximum which is known as shut-off head

C. At a particular speed the discharge at which efficiency of a pump is maximum, is known as normal discharge

D. The brake horse power required from the primemover to drive the pump, increases with the increase of discharge

E. all the above.

Answer: Option **E**

---

14. The maximum pressure to which a pipe is subjected to during its operation, is known

A. working pressure

B. design pressure

C. test pressure

D. pipe pressure

E. all the above.

Answer: Option **A**

---

15. To control the growth of algae in reservoirs, the compound which is used, is

A. bleaching powder

B. copper sulphate

C. lime solution

D. alum solution

E. all the above.

Answer: Option **B**

16. Pick up the wrong nominal internal diameter of cast iron (spun) pipes in mm from the following :

A. 300

B. 400

C. 500

D. 550

E. 600

Answer: Option **D**

---

17. Hardness of water can be removed by boiling if it is due to

A. calcium bicarbonates

B. calcium sulphates

C. calcium chloride

D. calcium nitrates.

Answer: Option **A**

---

18. A well is considered to be good if it is sunk into

A. Clay

B. Sand

C. Coarse gravel

D. Silt.

Answer: Option **C**

---

19. The nitrate concentration in domestic water supplies, is generally limited to

A. 10 ppm

B. 15 ppm

C. 25 ppm

D. 30 ppm

E. 45 ppm.

Answer: Option **E**

---

20. Sluice valves in main water supplies

A. are used to regulate the flow of water in pipes

B. are spaced about 5 km apart

C. are usually placed at the summits

D. all the above.

Answer: Option **D**

21. Dead storage of a reservoir of *Q* capacity generally provided for silt deposition during its life time, is generally kept

A. 1/8th *Q*

B. 1/6th *Q*

C. 1/5th *Q*

D. 1/4th *Q*

E. 1/3rd *Q*.

Answer: Option **D**

---

22. If the specific capacity of a well is 0.3183×10^{-3} per sec, the discharge from a well of 4 m diameter under a depression head of 4 m, is

A. 8 litres/sec

B. 10 litres/sec

C. 12 litres/sec

D. 14 litres/sec

E. 16 litres/sec.

Answer: Option **E**

---

23. The factor to be considered for the source of city water supply, is

A. quantity and quality of the available water

B. elevation of the source of water

C. general terrain intervening the area

D. all the above.

Answer: Option **D**

---

24. Pick up the correct statement from the following :

A. Domestic use of water is 50% of total consumption

B. Average consumption of commercial use of water is 25% of total consumption

C. Consumption of water on public use is 10% of total consumption

D. Waste water and leakage is 15% of total consumption

E. all the above.

Answer: Option **E**

---

25. Yield of a drainage basin is :

A. run off of the area expressed as instantaneous rate

B. average run off over a short period

C. total volume of water flowing annually

D. all the above.

Answer: Option **C**

26. Normal values of overflow rate for plain sedimentation tank using coagulants, is

A. 750 to 1000 litres/hr/m^2

B. 1000 to 1250 litres/hr/m^2

C. 1250 to 1500 litres/hr/m^2

D. 1500 litres/hr/m^2.

Answer: Option **B**

---

27. The formula $Q = P - K[1.8T + 32]$ in which Q is runoff, P is annual rain fall in cm, T is mean annual temperature in centigrades and K is a constant, is known

A. Justin's formula

B. Khosla's formula

C. English formula

D. Vermule's formula.

Answer: Option **B**

---

28. The formula for pipe flows, suggested by, Hazen-William is

A. $H_L = \frac{n^2 V^7 \,.\, L}{R^{4/3}}$

B. $V = 0.85\, C_H\, R^{0.63} \,.\, S^{0.54}$

C. $H_L = \frac{4\, f\, L\, V^2}{d.2g}$

D. None of these.

Answer: Option **B**

---

29. While selecting the location of an intake for collecting surface water, the factor considered, is

A. The intake point should be near as far as possible to the treatment plant

B. The intake point should be in purer zone of the water source

C. The intake point should be upstream of the point of disposal of waste water

D. The intake point in meandering rivers should be on concave banks

E. All the above;

Answer: Option **E**

---

30. Aqueducts are generally designed

A. circular

B. rectangular

C. horse shoe section

D. all the above.

Answer: Option **D**

31. Gravity conduits

A. carry water under gravity

B. follow the hydraulic gradient line

C. are carried on trestles in valleys and depressions

D. are carried through tunnels in deep cuttings

E. All the above.

Answer: Option **E**

---

32. Carbonates in water produce

A. temporary hardness

B. permanent hardness

C. acidity

D. alkanity.

Answer: Option **A**

---

33. Hardness of water is caused by

A. presence of soap lather

B. presence of chlorides and sulphates of sodium and potassium

C. presence of bicarbonates, sulphates or chlorides of calcium and magnesium

D. turbidity.

Answer: Option **C**

---

34. A slow sand filter is cleaned if its filter head is higher than

A. 10 cm to 20 cm

B. 20 cm to 40 cm

C. 40 cm to 70 cm

D. 70 cm to 120 cm

E. 120 cm to 150 cm.

Answer: Option **D**

---

35. A strainer type well sunk through three pervious layers intervened by three impervious aquicludes, draws water from

A. top most pervious layer

B. central pervious layer

C. lowest pervious layer

D. all the pervious layers.

Answer: Option **D**

36. The permissible amount of nitrites present in potable water, is

A. 10 ppm

B. 15 ppm

C. 20 ppm

D. 45 ppm

E. Nil.

Answer: Option **E**

---

37. Water having pH value as 6, is

A. alkaline

B. acidic

C. neutral

D. none of these.

Answer: Option **B**

---

38. Alum is chemically

A. Copper sulphate

B. Aluminium sulphate

C. Ferrous sulphate

D. Ferric sulphate.

Answer: Option **B**

---

39. If w is the weight of water per cubic metre, Q is the discharge in cubic metres per sec and H is the total head, the required water horse power of the pump, is

A. $\frac{wQH}{15}$

B. $\frac{wQH}{360}$

C. $\frac{wQH}{220}$

D. $\frac{wQH}{550}$

E. none of these.

Answer: Option **A**

---

40. Perched acquifers are generally found

A. on the surface of the ground

B. below the surface of the ground but above water table

C. below the water table

D. all the above.

Answer: Option **B**

41. Pickup the incorrect statement from the following :

A. The invert of pressure conduit is independent of the grade of the hydraulic gradient line

B. The pressure conduits may be taken uphill upto a maximum height of 8.3 m

C. Aqueducts and tunnels sections are generally kept circular

D. None of these.

Answer: Option **D**

---

42. Detention period of a settling tank is

A. average theoretical time required for water to flow through the tank

B. time required for flow of water to fill the tank fully

C. average time for which water is retained in tank

D. ratio of volume of basin of a sedimentation tank to the rate of flow

E. all the above.

Answer: Option **E**

---

43. Pick up the incorrect statement from the following :

A. Water disinfected with ozone is free from any odour

B. Ozone removes bacterias as well as colour and odour

C. ozonised water becomes tasteless

D. None of these.

Answer: Option **C**

---

44. The order of existence of three portions of water in a reservoir from the bottom to top is

A. useful storage + surcharge storage + dead storage

B. useful storage + dead storage + surcharge storage

C. dead storage + useful storage + surcharge storage

D. surcharge storage + useful storage + dead storage

E. none of these.

Answer: Option **C**

---

45. The approximate diameter of a water mains for supplying 7.2 mld with a velocity 1.2 m/sec, is

A. 24 cm

B. 26 cm

C. 28 cm

D. 30 cm

E. 32 cm.

Answer: Option **D**

6. The chlorine supply cylinders are generally kept at 38°C to 40°C to prevent

A. conversion into crystals

B. it from burning

C. it from explosion

D. none of these.

Answer: Option **A**

---

47. The capability of a soil mass of full width and depth to transmit water, is known

A. porosity

B. permeability

C. transmissibility

D. none of these.

Answer: Option **B**

---

48. Well treated water is generally supplied for

A. domestic use

B. commercial use

C. public use

D. waste water

E. all the above.

Answer: Option **E**

---

49. Non-pathogenic bacterias cause the following water borne disease,

A. cholera

B. typhoid

C. infections hepatitis

D. none of these.

Answer: Option **D**

---

50. Steel pipe are

A. suitable for withstanding high internal pressure

B. connected by riveted or welded joints

C. generally laid under ground and no expansion joint is required

D. likely to last 100 years under ordinary conditions

E. None of these.

Answer: Option **D**

Section 5

1. The most ideal disinfectant used for drinking water throughout the world, is

A. alum

B. lime

C. chlorine

D. nitrogen

E. ammonia.

Answer: Option **C**

---

2. A centrifugal pump is required to be primed before starting if it is located

A. at higher level than water level of reservoir

B. at lower level than water level of reservoir

C. both (a) and (b)

D. neither (a) nor (b).

Answer: Option **A**

---

3. The maximum pressure which the pipe can withstand without any leakage during hydrostatic pressure test, is called

A. Working pressure

B. Design pressure

C. Test pressure

D. Hydrostatic pressure.

Answer: Option **C**

---

4. Filtration of water is done to remove

A. colour

B. odour

C. turbidity

D. pathogenic bacteria

E. all the above.

Answer: Option **C**

---

5. Generally, first portion of a logistic curve for the population growth of a developing city, represents the growth of

A. increasing

B. decreasing

C. constant

D. all the above.

Answer: Option **A**

6. Ground water from artesian wells

A. contains no suspended materials

B. contains dissolved salts

C. may be saltish and hard

D. generally require lesser treatment

E. all the above.

Answer: Option **E**

---

7. Property of earth to allow water to pass through it, is known as

A. perviousness

B. porosity

C. permeability

D. transmissibility.

Answer: Option **A**

---

8. Derivation of Thiem's formula

$$Q = \frac{2\pi T (s_1 - s_2)}{2.3 \log_{10} \frac{r_2}{r_1}}$$

is based on the assumption

A. the aquifer is homogeneous, isotropic and of infinite depth and area

B. the well is sunk through the full depth of the aquifer

C. the flow lines are radial and horizontal, and the flow is laminar

D. for hydraulic gradient in Darcy's equation, tangent value is used for sine value

E. all the above.

Answer: Option **E**

---

9. Pick up the incorrect statement from the following :

A. Porosity of clay sand soil is 45%

B. Porosity of pure sand is 35%

C. Porosity of sand stone is up to 15%

D. Least porosity is that of granite and quartz

E. None of these.

Answer: Option **E**

11. Normal values of overflow rate for sedimentation tanks using coagulants in litres/hr/m^2 , generally range between

A. 250 to 500

B. 500 to 750

C. 750 to 1000

D. 1000 to 1250

Answer: Option **D**

---

12. In a rapid sand filter, air binding is caused due to excessive

A. negative pressure

B. pressure

C. turbidity

D. water pressure

E. all the above.

Answer: Option **A**

---

13. If average volume of sediment deposits is one-tenth million cubic metres per year in a reservoir of total capacity 10 million cubic metres, the dead storage will be filled up, in

A. 10 years

B. 15 years

C. 20 years

D. 25 years

E. 50 years.

Answer: Option **D**

---

14. A circular gravity aqueduct is not generally preferred to because of

A. its maximum hydraulic mean depth

B. maximum area per unit of wetted perimeter

C. minimum cost of construction

D. its proper support on the ground.

Answer: Option **D**

---

15. Standard unit of turbidity of water is in one litre of distilled water, one milligram of finely divided

A. silica

B. mud

C. clay

D. organic matter.

Answer: Option **A**

16. Water losses in water supply, is assumed as

A. 5%

B. 7.5%

C. 10%

D. 22.5%

E. 15%.

Answer: Option **E**

---

17. The pH value of water is kept slightly less than 7 so that hydrochloride ions may combine with ammonia ions to form

A. Mono-chloramine (NHCl)

B. Di-chloramine (NH_2Cl)

C. Nitrogen trichloramine (NCl_3)

D. All the above.

Answer: Option **D**

---

18. 'Shrouding' is essentially provided in

A. strainer type wells

B. cavity type wells

C. slotted type well

D. all the above.

Answer: Option **C**

---

19. The ensure proper growth of children's teeth, the quantity of flouride used in water mains, is

A. 1 mg/litre

B. 2 mg/litre

C. 3 mg/litre

D. 4 mg/litre

E. 5 mg/litre.

Answer: Option **A**

20. Chemical coagulation of drinking water, is done

A. to settle suspended materials

B. to increase rate of settlement of suspended materials

C. to remove the bacterias

D. none of these.

Answer: Option **B**

21. Permanent hardness of water can be removed by

A. adding alum

B. adding lime

C. adding chlorine

D. boiling

E. zeolite process.

Answer: Option **E**

---

22. Demand for public uses in a city, does not include water required for

A. watering of public parks

B. watering of public gardens

C. sprickling on roads

D. drinking purposes.

Answer: Option **D**

---

23. The chloride content of treated water for public supplies should not exceed

A. 100 ppm

B. 150 ppm

C. 200 ppm

D. 250 ppm

E. 300 ppm.

Answer: Option **D**

---

24. An aquiclude is

A. a non artesian aquifer

B. an artesian acquifer

C. a confined bed of impervious material between acquifers

D. a large water body under ground.

Answer: Option **C**

---

25. Pick up the incorrect statement from the following :

A. The net amount of water which joins the surface streams in a catchment, is known as surface run-off

B. The amount of water which joins the stream from the underground water, is called base flow

C. The yearly run off in cm depth over the catchment, is termed as the yield of the drainage basin

D. The yield of drainage in cm depth multiplied by the area of the catchment gives the annual volume of water

E. None of these.

Answer: Option **E**

26. In an artesian acquifer, the draw downs in two observation wells at distances 100 m, and 200 m were found same after one hour and *x* hours respectively. The value of *x*, is

A. 2 hours

B. 4 hours

C. 9 hours

D. 16 hours.

Answer: Option **B**

---

27. Dissolved carbon dioxide, can be removed from the supply main by

A. sedimentation

B. aeration

C. chlorination

D. coagulation

E. none of these.

Answer: Option **B**

---

28. Slow sand filter is used if maximum turbidity of raw water is less than

A. 10 gm/litre

B. 20 gm/litre

C. 30 gm/litre

D. 40 gm/litre

E. 50 gm/litre.

Answer: Option **E**

---

29. The external load per unit length of

A. a pipe laid on, or projecting above the undisturbed ground and covered with fills, is proportional to the square of the external diameter of the pipe

B. a flexible pipe burried in narrow trenches and thoroughly compacted side fills, is proportional to the product of the width of the trench and diameter of the pipe

C. a rigid pipe burried in a narrow trenches and thoroughly compacted side fills, is proportional to the square of the width of the trench

D. all the above.

Answer: Option **D**

---

30. The total domestic consumption in a city water supply, is assumed

A. 20%

B. 30%

C. 40%

D. 60%.

Answer: Option **D**

31. Alum is a

A. coagulant

B. flocculant

C. catalyst

D. disinfectant.

Answer: Option **A**

---

32. If *L*, *B* and *D* length, breadth and depth of water in a rectangular sedimentation tank of total discharge *Q*, the settling velocity, is

A. $\frac{Q}{H}$

B. $\frac{Q}{D}$

C. $\frac{Q}{D \times B}$

D. $\frac{Q}{L \times B}$

E. $\frac{Q}{H \times D}$

Answer: Option **D**

---

33. In a reservoir the average volume of sediment deposition is 0.15 million cubic per year. If the dead storage and total capacity of the reservoir are 8 million cubic metres and 36 million cubic metres respectively,

A. the reservoir will theoretically be silted in 240 years

B. the reservoir will start reducing after 60 years

C. both (a) and (b)

D. neither (a) nor (b).

Answer: Option **C**

---

34. *Q* is the discharge from an unconfined tube well with depression head *S* through a pipe of radius *rw*. If the radius of influence is *R*, the minimum required length of the strainer, is

A. $\frac{2.3Q \log_{10} \frac{R}{rw}}{2\pi Ks} - \frac{S}{2}$

B. $\frac{2.3Q \log_{10} \left(\frac{R}{rw}\right)^2}{2\pi Ks} - \frac{S}{2}$

C. $\frac{2.3Q \log_{10} \left(\frac{R}{rw}\right)^2}{2\pi Ks} + \frac{S}{2}$

D. $\frac{2.3Q \log_{10} \left(\frac{R}{rw}\right)}{2\pi Ks} + \frac{S}{2}$

Answer: Option **A**

---

35. The requirement of water per capita per day, is

A. 90 litres

B. 150 litres

C. 250 litres

D. 400 litres.

Answer: Option **A**

36. Pick up the incorrect statement from the following. In take of water supply should

A. be nearer to the treatment plant

B. receive water from purer zone of the source

C. be located downstream of waste water disposal point

D. remain easily accessible during floods.

Answer: Option **C**

---

37. Reciprocating pumps

A. are not suitable for variable heads

B. are four times costlier than centrifugal pumps

C. are not suitable for pumping water containing sediments

D. single stroke produce pulsating flow

E. none of these.

Answer: Option **A**

---

38. The temporary hardness of water can be removed by

A. boiling

B. adding lime

C. adding alum

D. filtration

E. sedimentation.

Answer: Option **A**

---

39. Rapid gravity filters

A. were developed by G.W. Fullar

B. make use of coarser sand with effective size as 0.5 mm

C. yield as high as 30 times the yield of slow sand filters

D. are fed with coagulation treated water

E. all the above.

Answer: Option **E**

---

40. If n is porosity, y is specific yield and r is specific retention of any soil, the relationship which holds good, is

A. $n + y + r = 1$

B. $n + y = r$

C. $n + r = y$

D. $y + r = n$

E. $n + r + y = 0$

Answer: Option **D**

41. The coefficient of permeability of soils, is generally expressed in

A. cm/sec

B. cm/minute

C. cm^2/sec

D. cm^2/minute.

Answer: Option **A**

---

42. Pick up the correct statement from the following :

A. Head loss in smaller size pipes at equal velocities, is less

B. Cost of pumping is less in smaller size pipes

C. Cost of smaller pipes is comparatively more

D. None of these.

Answer: Option **D**

---

43. Total flow in stream is known

A. run off

B. stream flow

C. discharge

D. all the above.

Answer: Option **D**

---

44. Disinfection of drinking water is done to remove

A. turbidity

B. odour

C. colour

D. bacterias

E. all the above.

Answer: Option **D**

---

45. The ratio of total capacity and dead storage is kept

A. 8

B. 6

C. 4

D. 3

E. 2

Answer: Option **C**

46. The U.C. (uniformity coefficient) $\frac{D_{60}}{D_{10}}$ for the best filter media sand should be

A. 2

B. 3

C. 4

D. 5

E. none of these.

Answer: Option **A**

---

47. Pick up the correct statement from the following :

A. Deposition of calcium carbonate on the inside of the well pipe, causes incrustation of the pipe

B. Incrustation of the pipe reduces the discharge

C. Acidic waters cause corrosion of the pipes

D. Corrosion results due to excessive withdrawal of sand along with water

E. All the above.

Answer: Option **E**

---

48. Specific yield of a well is

A. quantity of water than can be drawn from the well

B. flow of water per unit time

C. total quantity of water available in the well

D. quantity of water per unit time per unit draw-down.

Answer: Option **C**

---

49. Normal values of overflow rate for plain sedimentation tanks in litres/hr/m^2, generally range between

A. 100 to 250

B. 250 to 500

C. 500 to 750

D. 750 to 1000

Answer: Option **C**

50. The formula $H_L = \frac{n^2 V^2 \cdot L}{R^{4/3}}$ for the head loss in conduits is generally known as

A. Hazen-William's formula

B. Manning's formula

C. Darcy-Weisbach formula

D. Nikuradse formula.

Answer: Option **B**

Section 6

1. Manholes are less common in

A. cast iron pipes

B. steel pipes

C. hume steel pipes

D. R.C.C. pipes.

Answer: Option **A**

---

2. Pick up the correct statement from the following :

A. If ports are closed, the dry intake towers will not have any water

B. Even if ports are closed, the wet intake tower will have water filled up to reservoir level

C. The dry intake towers are generally constructed with heavier construction to resist buoyant forces

D. No buoyant force acts on wet intake towers

E. All the above.

Answer: Option **E**

---

3. While designing a water supply of an industrial township, industrial and commercial water demand of total supply, is assumed

A. 10%

B. 10 to 15%

C. 15 to 20%

D. 20 to 25%.

Answer: Option **D**

---

4. The storage capacity of a reservoir may be divided into three zones. The lowest zone is

A. Dead storage

B. Useful storage

C. Surcharge storage

D. None of these.

Answer: Option **A**

---

5. In a rapid gravity filter

A. raw water from the source is supplied

B. disinfected raw water is supplied

C. raw water passed through coagulation tank is supplied

D. none of these.

Answer: Option **C**

6. In distribution pipes, air valves are provided at

A. lower points

B. junction points

C. higher points

D. any where.

Answer: Option **C**

---

7. The flow of water gets retarded, in

A. settling tank

B. sedimentation tank

C. clarifer

D. sedimentation basin

E. all the above.

Answer: Option **E**

---

8. Surcharge storage zone of a reservoir, is

A. below dead storage

B. between dead storage and useful storage

C. above useful storage

D. also known as valley storage.

Answer: Option **C**

---

9. Surface water may

A. contain large amount of impurities

B. be contaminated by impurities

C. contain disease producing bacterias

D. all the above.

Answer: Option **D**

---

10. For a city developed haphazardly, the layout of distribution pipes preferred to, is

A. ring system

B. radial system

C. grid iron system

D. dead end system.

Answer: Option **D**

11. Asbestos pipes are joined by means of

A. flanged joint

B. flexible joint

C. dresser coupling joint

D. simplex joint

E. socket and spigot joint.

Answer: Option **D**

---

12. Abyssinian tube well is a special type of

    A. slotted type wells

    B. cavity type wells

    C. strainer type well

    D. none of these.

    Answer: Option **C**

---

13. Chlorination of water does not remove

    A. ammonia content

    B. B.O.D.

    C. organic matter content

    D. dissolved oxygen.

    Answer: Option **D**

---

14. The efficiency of a pumping set, is generally assumed

    A. 50%

    B. 55%

    C. 60%

    D. 65%

    E. 70%.

    Answer: Option **D**

---

15. To remove very fine suspended particles from water, the method adopted is

    A. screening

    B. sedimentation

    C. boiling

    D. filtration.

    Answer: Option **D**

16. Velocity of flow of water in plain sedimentation water tank, is normally kept

    A. 3 cm/minute

    B. 10 cm/minute

    C. 20 cm/minute

    D. 30 cm/minute

    E. 40 cm/minute.

    Answer: Option **D**

---

17. The most important and widely used tube well in India, is

    A. strainer well

B. cavity well

C. slotted well

D. perforated pipe well.

Answer: Option **A**

---

18. Pick up the correct statement from the following :

A. The precipitation during its travel in atmosphere dissolves certain gases

B. Rain water which percolates through the ground, is free from suspended materials

C. Under ground water may dissolve minerals and salts present in the earth's layers

D. Small quantities of iron, calcium and magnesium dissolved in water, may be useful for human health

E. All the above.

Answer: Option **E**

---

19. The maximum permissible chloride content in treated water of public water supplies should not exceed

A. 50 P.P.M.

B. 100 P.P.M.

C. 150 P.P.M.

D. 200 P.P.M.

E. 250 P.P.M.

Answer: Option **E**

---

20. To pump water from a water reservoir 3 m deep and maximum water level at 135 m, a pump is installed to lift water up to R.L. 175 m at a constant rate of 36, 00, 000 litres per hour. If the length of the pipe is 1506 m and $f = 0.01$, ignoring other minor losses and assuming the economical diameter from Lea's formula $D = 1.2\ Q$, the water horse power of the pump is

A. 400

B. 450

C. 500

D. 580

E. 600

Answer: Option **E**

21. Disappearance of pink colour of water of a well due of $KMnO_4$ indicates that water contains

A. acidity

B. alkalinity

C. turbidity

D. organic matter

E. all the above.

Answer: Option **D**

---

22. Shales are

A. porous

B. permeable

C. porous and permeable

D. porous but not permeable

E. neither porous nor permeable.

Answer: Option **D**

24. Grade aqueducts are not allowed to run

A. full

B. $\frac{3}{4}$ th full

C. $\frac{1}{2}$ full

D. $\frac{1}{4}$ th full.

Answer: Option **A**

---

25. The type of joint generally used in cast iron pipes, is

A. socket and spigot joint

B. flanged joint

C. dresser coupling joint

D. flexible joint

E. all the above.

Answer: Option **E**

26. Growth of population can be conveniently represented by

A. an arithmetical curve

B. a semi-logarithmic curve

C. a logistic curve

D. a straight line curve

E. all the above.

Answer: Option **C**

---

27. In a well planned city, the layout of distribution pipes generally adopted, is

A. grid-iron system

B. interlaced system

C. reticulation system

D. all the above.

Answer: Option **D**

---

28. Air valves are generally provided in pressure pipes of water supply

A. at pipe junctions

B. at summits

C. at low points

D. near service pipes.

Answer: Option **B**

---

29. Pick up the correct statement from the following :

A. The water level in a still well, represents the ground water table level

B. The difference between water table level and the water level in a well after pumping, is called depression head

C. The surface of water table surrounding a well during pumping, forms a cone of depression

D. The distance from the centre of the well up to the place where level of water table is not affected, is called radius of influence

E. All the above.

Answer: Option **E**

---

30. Bacterias which can survive with or without free oxygen, are known

A. aerobic bacterias

B. anerobic bacterias

C. facultative bacterias

D. none of these.

Answer: Option **C**

31. The maximum permissible colour for domestic supplies based on cobalt scale, is

A. 5 ppm

B. 10 ppm

C. 15 ppm

D. 20 ppm

E. 25 ppm.

Answer: Option **D**

---

32. The dilution ratio at which the odour is hardly detectable is generally called threshold odour number and for public supplies it should not exceed

A. 3

B. 5

C. 7

D. 9

E. 10

Answer: Option **A**

---

33. The joint used for joining the plain ends of cast iron pipes, is

A. flanged joint

B. socket and spigot joint .

C. dresser coupling joint

D. flexible joint

E. expansion joint.

Answer: Option **C**

---

34. The bacterias which may survive with or without free oxygen, are called

A. Aerobic bacterias

B. Anaerobic bacterias

C. Faculative bacteria's

D. None of these.

Answer: Option **C**

---

35. Detention time for plain sedimentation tank usually ranges from

A. 2 to 4 hours

B. 4 to 8 hours

C. 6 to 10 hours

D. 8 to 12 hours

E. 12 to 16 hours.

Answer: Option **B**

36. The rate of silting in a reservoir

A. is less in the beginning

B. remains constant throughout

C. is more in the beginning

D. is more in the beginning and reduces in the end

E. none of these.

Answer: Option **D**

---

37. Estimates of a water supply project depends upon the rate of water supply per capita consumption and probable population estimated at the end of the design period of

A. 5 to 10 years

B. 10 to 15 years

C. 15 to 20 years

D. 20 to 30 years

E. 25 years.

Answer: Option **D**

---

38. In centrifugal pump installation,

A. pump is properly primed before starting

B. the diameter of the pipe at inlet as well as at outlet, is kept smaller than the delivery pipe

C. the foot valve fitted at the bottom end of the suction pipe, prevents the movement of water from the pump when it is stopped

D. the motor may burn out if it is started with empty delivery pipe and with open gate valve

E. all the above.

Answer: Option **E**

---

39. Pipes are laid parallel

A. to increase the capacity of the water supply

B. to provide a means of repairing without closing water supply

C. to meet the requirement of excessive supply

D. all the above.

Answer: Option **D**

---

40. Maximum permissible colour for domestic water supplies, based on Cobalt scale, is

A. 5 P.P.M.

B. 10 P.P.M.

C. 15 P.P.M.

D. 20 P.P.M.

E. 25 P.P.M.

Answer: Option **D**

41. 135 litres of water per person per day, is provided in

A. nurses homes

B. hostels

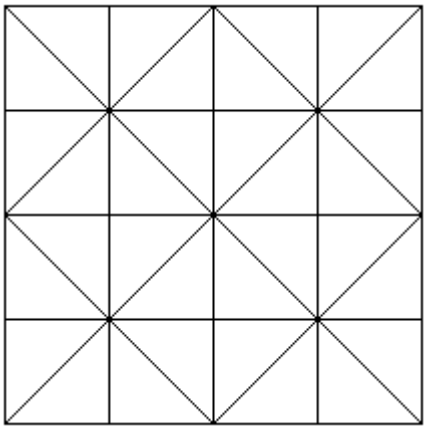
C. residential schools

D. all the above.

Answer: Option **D**

---

42. For a network of distribution pipes of a proposed township shown in the below figure, the layout of distribution system, is



A. dead end system

B. grid-iron system

C. ring system

D. radial system.

Answer: Option **D**

---

43. If *P* is population of a city in thousands and *Q* is fire demand in litres per minute, for proper estimate of water, the Empirical formula $Q = 1135\left(\frac{P}{5} + 10\right)$ is suggested by

A. National Board of fire under-writers

B. Freeman

C. Kuichling

D. None of these.

Answer: Option **B**

---

44. The gaseous form of chlorine gets converted into liquid form when subjected to a pressure of

A. 5 kg/cm^2

B. 6 kg/cm^2

C. 7 kg/cm^2

D. 8 kg/cm^2

E. 10 kg/cm^2.

Answer: Option **C**

---

45. The pH value of water fit for drinking, is

A. 13

B. 11

C. 9

D. 7

E. 5

Answer: Option **D**

46. Pick up the incorrect statement from the following. The source of surface water is from

A. streams and rivers

B. storage reservoirs

C. springs

D. ponds and lakes

E. none of these.

Answer: Option **C**

---

47. For the prediction of future population of a city, the factor to be considered, is

A. births

B. deaths

C. migrants

D. all the above.

Answer: Option **D**

---

48. Pick up the correct statement from the following :

A. Large solids carried along the river bed, is known as bed load

B. The bigger suspended particles get deposited in the head reaches of the reservoir

C. The fine sediment deposits are generally near the face of the dam

D. Deposition of sediment in the reservoir, reduces the capacity of the reservoir

E. **All the above.**

---

49. Pick up the incorrect statement from the following :

A. The flow in strainer type wells is radial

B. The flow in cavity type wells in spherical

C. In strainer type wells, area of flow depends upon the length of the strainer pipe

D. In cavity type wells, area of flow depends upon the size of the cavity

E. None of these.

Answer: Option **C**

---

50. Water may not contain much impurities if its source is

A. reservoirs

B. stream flowing in plains

C. lakes in lower regions

D. spring along hill slopes

E. none of these.

Answer: Option **D**

Section 7

1. Raw water treated with only chlorine, is known as

A. plain chlorination

B. pre-chlorination

C. first-chlorination

D. de-chlorination

E. none of these.

Answer: Option **A**

---

2. The level of underground water is called

A. water level

B. water table

C. negative level

D. invert level.

Answer: Option **B**

---

3. Per capita demand of water is calculated in litres

A. per person per day

B. per person per month

C. per person per year

D. none of these.

Answer: Option **A**

---

4. P.V.C. pipes can withstand pressure bead of water upto

A. 25 m

B. 50 m

C. 75 m

D. 100 m

E. 125 m.

Answer: Option **D**

---

5. The population of a city in 2000 is 50,000. The average increase in population over last 8 decades is 7500 and average incremental increase during 8 decades is 750. The population of the city based on incremental method, in the year 2020 will be

A. 55,000

B. 60,500

C. 66,500

D. 72,500

E. 76,500

Answer: Option **C**

6. Air inlet valve in water mains, is generally provided at

A. summit of the pipe

B. upstream of sluice valve

C. down stream of sluice valve

D. valley of the pipe

E. both (a) and (c) of above.

Answer: Option **E**

---

7. The duration of contact of chlorine with water before it is served to the first consumer, should be at least

A. 10 to 15 minutes

B. 15 to 20 minutes

C. 20 to 30 minutes

D. 30 to 40 minutes

E. one hour.

Answer: Option **C**

---

8. The diameter of pipes in bath rooms and lavatories in domestic water supply, is

A. 6 mm

B. 12 mm

C. 18 mm

D. 24 mm.

Answer: Option **B**

---

9. Pick up the incorrect statement from the following :

A. The water entering the slow sand filters should be treated by 9.386 coagulants

B. The depth of water on the filter should be twice the depth of the filter sand

C. When the filter head is 0.75 times the depth of filter sand, the water obtained is purest

D. The cleaning of slow sand filters is done by back washing

E. All the above.

Answer: Option **E**

---

10. *m* and *n* are monsoon duration factor and catchment factor respectively. If *P* is yearly rainfall in cm, runoff can be calculated by

A. velocity area method

B. weir or spillway method

C. use of venturi-meter

D. using power plant consumption

E. none of these.

Answer: Option **A**

11. Most important method for calculating discharge for planning a water supply project, is

A. velocity area method

B. weir or spillway method

C. use of venturi-meter

D. using power plant consumption

E. none of these.

Answer: Option **A**

---

12. Alkalinity in water may be caused due to

A. calcium and magnesium bicarbonates

B. sodium carbonate

C. potassium carbonate

D. calcium hydroxide

E. all the above.

Answer: Option **E**

---

13. Open channels supported over tres-les, are generally known as

A. raised canals

B. acqueducts

C. syphons

D. flumes.

Answer: Option **D**

---

14. For least effect on the water table, the tube wells must be dug one in every

A. 0.5 sq km

B. 0.75 sq km

C. 1.0 sq km

D. 1.25 sq km

E. 1.5 sq km.

Answer: Option **E**

---

15. In plain sedimentation tanks under normal conditions, impurities are removed upto

A. 60%

B. 70%

C. 80%

D. 90%.

Answer: Option **B**

16. Pick up the correct statement from the following :

A. Due to boiling, the bacterias present in water can be destroyed

B. Lime may be used for softening hard water

C. Excess lime when added to water, raises the pH value of water

D. the bacterias do not survive in water having pH value exceeding 9.5

E. All the above.

Answer: Option **E**

---

17. For the same draw down in two observations wells at distances *r1* and *r2*, the times after start of pumping are *t1* and t_2 hours

respectively. The relation which holds good is

A. $t_2 = \frac{r_2}{r_1} \times t_1$

B. $t_2 = \left(\frac{r_2}{r_1}\right)^2 \times t_1$

C. $t_2 = \left(\frac{r_2}{r_1}\right)^3 \times t_1$

D. $t_2 = \left(\frac{r_2}{r_1}\right) t_1^2$

E. none of these.

Answer: Option **B**

---

18. The valve fitted closely in a recess against an opening in a pipe, is generally

A. wedge shaped circular disc

B. spherical disc

C. parallelopiped disc

D. conical shaped circular disc.

Answer: Option **A**

---

19. For calculation of economical diameter *D* of a pipe in metres for a discharge *Q* to be pumped in cumecs, Lea suggested the empirical formula

A. $D = 0.22\ Q$

B. $D = 1.22\ Q$

C. $D = 2.22\ Q$

D. $D = 3.22\ Q$

E. $D = 1.33\ Q$.

Answer: Option **B**

---

20. S_1 and S_2 are the draw downs in an observation well at times t_1 and t_2 after pumping. For discharge Q and coefficient of transmissibility T, the relationship, is

A. $S_2 - S_1 = \frac{2.3Q}{\pi T} \log_{10} \frac{t_2}{t_1}$

B. $S_2 - S_1 = \frac{2.3Q}{4\pi T} \log_{10} \frac{t_2}{t_1}$

C. $S_2 - S_1 = \frac{2.3Q}{4\pi T} \log_e \frac{t_2}{t_1}$

D. $S_2 - S_1 = \frac{2.3Q}{4\pi T} \log_e \frac{t_1}{t_2}$

Answer: Option **B**

21. An ideal sand for filters should be

A. free from dirt and other impurities

B. uniform in nature and size

C. hard and resistant

D. all the above.

Answer: Option **D**

---

22. The maximum non-verticality of the bore of a well 200 m deep, may be permitted up to

A. 25 cm

B. 50 cm

C. 75 cm

D. 100 cm

E. 150 cm.

Answer: Option **D**

---

23. By adding 1 ml of orthotolidine solution to 100 ml chlorinated water taken after contact period, the residual chlorine makes the colour of solution

A. yellowish

B. greenish

C. bluish

D. reddish

E. violet.

Answer: Option **A**

---

24. From the surface of reservoir, evaporation may be minimised by sprinkling

A. Spirit

B. Hydrochloric acid

C. Cetyl alcohol

D. Methane

E. None of these.

Answer: Option **C**

---

25. Gravity conduits are generally in the form of

A. canals

B. flumes

C. aqueduct

D. tunnels

E. all the above.

Answer: Option **E**

26. Pick up the correct statement from the following :

A. The ratio of the total sediment deposited in the reservoir to the total sediment flowing in the river, is called trap efficiency

B. The ratio of the reservoir capacity to the total inflow of water in it, is generally called capacity inflow ratio

C. Small capacity reservoirs on large rivers generally, silt less

D. Large capacity reservoirs on small rivers generally silt more

E. All the above.

Answer: Option **E**

---

27. Pressure relief valves are provided in water mains

A. to reduce the pressure

B. at low points

C. upstream of sluice

D. all the above.

Answer: Option **D**

---

28. Pick up the incorrect statement from the following :

A. Iron salts produce heavy flocs and hence remove more suspended matter

B. Iron salts remove hydrogen sulphides

C. Iron salts can be used over a limited range of pH values

D. Iron salts impart corrosiveness to water.

Answer: Option **C**

---

29. The percentage of chlorine in fresh bleaching powder is roughly

A. 50 to 60

B. 30 to 35

C. 40 to 50

D. 20 to 25

Answer: Option **B**

---

30. Higher yield may be expected from

A. gravity springs

B. surface springs

C. artesian springs

D. all the above.

Answer: Option **C**

1. The intake opening is generally covered by a screen to prevent entry of debris etc. and its level is kept

A. at the level of water of the source

B. at the bottom of water of the source

C. at about 2.5 m above the bottom

D. none of these.

Answer: Option **C**

---

32. In rapid sand filters the ratio of length and diameter of the lateral, should not be greater than

A. 10

B. 15

C. 20

D. 25

Answer: Option **C**

---

33. The maximum permissible hardness for public supplies is

A. 95 mg/litre

B. 105 mg/litre

C. 115 mg/litre

D. 125 mg/litre

E. 150 mg/litre.

Answer: Option **C**

---

34. Plain chlorination is used for water

A. with turbidities less than 20 mg/litre

B. obtained from clear lakes

C. consumed during emergencies

D. supplies to armies during war

E. all the above.

Answer: Option **E**

---

35. Underground water is obtained from

A. rains

B. rivers

C. lakes

D. reservoirs

E. springs.

Answer: Option **E**

36. Water may contain

A. bicarbonate alkalinity

B. carbonate alkalinity

C. hydroxide alkalinity

D. caustic alkalinity

E. all the above.

Answer: Option **E**

---

37. Pick up the correct statement from the following :

A. The pH value of neutral water is 7

B. The maximum acidity is obtained when pH value is zero

C. The maximum alkalinity is obtained when pH value is 14.

D. All the above.

Answer: Option **D**

---

38. For controlling algae, the most commonly used chemical, is

A. copper sulphate

B. alum

C. lime

D. bleaching powder.

Answer: Option **A**

---

39. According to Godrich the ratio of peak demand rate to mean demand is

A. $\frac{\text{Max. daily demand}}{\text{Average daily demand}} = 180\%$

B. $\frac{\text{Max. weekly demand}}{\text{Average weekly demand}} = 148\%$

C. $\frac{\text{Max. monthly demand}}{\text{Average monthly demand}} = 128\%$

D. $\frac{\text{Max. half yearly demand}}{\text{Average half yearly demand}} = 107\%$

E. All the above.

Answer: Option **E**

---

40. The head against which the motor works for lifting water, is

A. maximum depth of water table below ground level

B. maximum depression head

C. velocity head

D. frictional losses in the delivery pipe

E. all the above.

Answer: Option **E**

41. Rapid sand filter

A. should be preceeded by coagulation and sedimentation

B. uses rapid sand as filter media

C. is used after slow sand filtering has been done

D. can combine disinfection also.

Answer: Option **A**

---

42. Pick up the correct statement from the following :

A. Copper pipes are highly resistant to acidic and alkaline water

B. Wrought iron pipes are lighter than cast iron pipes

C. Wrought iron pipes corrode quickly and are less durable

D. Wrought iron pipes coated with zinc, are called galvanised iron pipes

E. All the above.

Answer: Option **E**

---

43. Rapid gravity filters can remove bacterial impurities up to a maximum of

A. 50%

B. 60%

C. 70%

D. 80%

E. 90%.

Answer: Option **D**

---

44. Cast iron pipes

A. are widely used in city water supplies

B. resist corrosion satisfactorily

C. may last for 100 years

D. are normally manufactured in lengths of about 3.5 m

E. all the above.

Answer: Option **E**

---

45. Run off is the quantity of water which flows

A. in sewer pipes

B. due to leakage in pipes

C. in rivers

D. none of these.

Answer: Option **C**

46. Efficiency of removing bacterias from raw water by a slow sand filter, is

A. 80% to 81%

B. 85% to 86%

C. 90% to 97%

D. 98% to 99%.

Answer: Option **D**

---

47. De-chlorination is followed by

A. post-chlorination

B. pre-chlorination

C. double-chlorination

D. super-chlorination.

Answer: Option **D**

---

48. The bed slope in slow sand filters, is generally kept

A. 1 in 50

B. 1 in 75

C. 1 in 100

D. 1 : 200

Answer: Option **C**

---

49. When gravity and pumping systems of water distribution are adopted, the type of distribution reservoir, is

A. elevated tank

B. ground source reservoir

C. intz tank

D. stand pipe.

Answer: Option **A**

---

50. The average domestic consumption under normal conditions in an Indian city per day per person, is

A. 105 litres

B. 115 litres

C. 125 litres

D. 135 litres

E. 150 litres.

Answer: Option **D**

Section 8

1. Capacity of soil to absorb moisture, is generally known as

A. permeability

B. porosity

C. infiltration capacity

D. perviousness.

Answer: Option **C**

---

2. At break point of chlorination,

A. chlorine is used to oxidise

B. residual chloride is zero

C. residual chloride is maximum

D. residual chlorine reappears.

Answer: Option **D**

---

3. The difference in the reservoir level and the lowest point of the water mains is 180 m. The expected pressure due to water hammer is 7.5 kg/cm^2 in a pressure conduit of diameter 1 m. Assuming the efficiency of the riveted joints of the pipe as 0.6 and minimum cover 3 mm for corrosion, the thickness of the pipe materials, is

A. 10 mm

B. 15 mm

C. 20 mm

D. 25 mm

E. 30 mm.

Answer: Option **C**

---

4. The factor for the selection of pumping station site, is

A. distance of the source of contamination or pollution

B. height above the H.F.L. of the river

C. future expansion

D. proximity of the site from the railway station

E. all the above.

Answer: Option **E**

---

5. Low turbidity of water is detected by

A. Turbidity tube

B. Jackson turbidity meter

C. **Baylis turbidimeter**

D. Hellipe turbidimeter

E. None of these.

Answer: Option **C**

6. Pick up the incorrect statement from the following :

A. The pH value of water indicates the logarithm of reciprocal of hydrogen ion concentration in water

B. Higher value of pH means lower hydrogen ion concentration

C. Lower value of pH means higher hydrogen ion contraction

D. Lower value of pH gives alkaline solution

E. None of these.

Answer: Option **D**

---

7. Pick up the correct statement from the following :

A. The volume of underground water extracted by gravity drainage from a saturated soil, is known as yield

B. The ratio of volume drained to the total volume of material drained, is known as specific yield

C. The volume of water retained by the soil against the pull of gravity, is called specific retention or field capacity

D. The sum of specific yield and specific retention, is equal to porosity

E. All the above.

Answer: Option **E**

8. Perched acquifers generally occur

A. below water table

B. above water table

C. in acquicludes

D. in artesian acquifers

E. none of these.

Answer: Option **B**

---

9. Silt storage is the same as

A. dead storage

B. live storage

C. effective storage

D. none of these.

Answer: Option **A**

---

10. For complete stabilisation of organic matter in polluted water, it takes

A. 5 days

B. 10 days

C. 20 days

D. 30 days

E. 40 days.

Answer: Option **D**

11. A pressure conduit carrying water beneath a stream or a canal, is known as

A. sag

B. depressed pipe

C. inverted syphon

D. all the above.

Answer: Option **D**

12. Suction lift of a pump depends upon

A. atmospheric pressure

B. water temperature

C. velocity of water in suction pipe

D. frictional losses

E. all the above.

Answer: Option **E**

---

13. For 3.25×10^{-2} cumecs discharging from a well, a pump is installed to lift water against a total head of 30 m. The minimum required horse power, is

A. 10 H.P.

B. 15 H.P.

C. 18 H.P.

D. 20 H.P.

E. 25 H.P.

Answer: Option **D**