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## Unit I

### Water Technology

Q. 1. Suspended impurities can be separated by\_\_\_\_\_.

- a. Zeolite process
- b. Ion Exchange process
- c. Filtration
- d. Osmosis

Ans: c

Q. 2. The impurities in water having particle size greater than \_\_\_\_\_ are suspended particles.

- a. 1000 A°
- b. 10 A°
- c. 0.1 A°
- d. 1 A°

Ans: a

Q. 3. The impurities like bacteria, fungi etc. and other small size aquatic animals are coming in the category of \_\_\_\_\_ impurities.

- a. Suspended
- b. Biological
- c. Colloidal
- d. Dissolved

Ans: b

Q. 4. Water which does not form lather readily with soap is called as \_\_\_\_\_.

- a. Soft water
- b. Pure water
- c. Impure water
- d. Hard water

Ans: d

Q. 5. The water which contains impurities like  $\text{Ca}(\text{HCO}_3)_2$ ,  $\text{Mg}(\text{HCO}_3)_2$ ,  $\text{MgCO}_3$  is the type of \_\_\_\_\_ hardness.

- a. Carbonate
- b. Non-carbonate
- c. Permanent
- d. Mild

Ans: a

Q. 6. When water is becoming hard due to the salts other than carbonates then the type of hardness is \_\_\_\_\_.

- a. Carbonate
- b. Non-carbonate
- c. Sulphate
- d. Nitrate

Ans: b

Q. 7.  $\text{MgCO}_3 + \text{H}_2\text{O}$  Boiled  $\text{Mg}(\text{OH})_2 + \text{CO}_2$   
The hardness removed by above method is \_\_\_\_\_ hardness.

- a. Mild
- b. Temporary
- c. Non-carbonate
- d. Permanent

Ans: b

Q. 8. Rain water is \_\_\_\_\_ water.

- a. Hard
- b. Soft
- c. Impure
- d. Double distilled

Ans: b

Q. 9. Commonly used unit of hardness is \_\_\_\_\_.

- a. ml
- b. Kg
- c. ppm of  $\text{CaCO}_3$
- d. cm

Ans: c

Q. 10. To avoid corrosion due to dissolved oxygen, water is treated with \_\_\_\_\_.

- a.  $\text{CaCO}_3$
- b.  $\text{CuSO}_4$
- c.  $\text{Na}_2\text{SO}_3$
- d.  $\text{KMnO}_4$

Ans: c

Q. 11. Dissolved  $\text{CO}_2$  from water is removed by adding suitable amount of \_\_\_\_\_.

- a.  $\text{NH}_3$
- b.  $\text{CO}_2$
- c.  $\text{H}_2\text{S}$
- d.  $\text{H}_2\text{O}$

Ans: a

Q. 12. To prevent corrosion due to acid formation the pH of the boiler feed water is maintained in between \_\_\_\_\_.

- a. 2 to 4
- b. 8.5 to 9
- c. 3.5 to 7
- d. 11.5 to 14

Ans: b

Q. 13. Galvanic corrosion can be avoided by suspending \_\_\_\_\_ plates.

- a. Steel
- b. Chromium
- c. Aluminium
- d. Zinc

Ans: d

Q. 14. When boiler produces steam rapidly, some water droplets are carried along with steam. This process of wet steam formation is called as \_\_\_\_\_.

- a. Carry over
- b. Foaming
- c. Priming
- d. Sludge formation

Ans: c

Q. 15. Foaming is formation of continuous \_\_\_\_\_ on the surface of water.

- a. Steam
- b. Sludge
- c. Droplets
- d. Foam

Ans: d

Q. 16. Priming and foaming reduces \_\_\_\_\_.

- a. Efficiency of machines.
- b. Hardness of water.
- c. Alkalinity of water.
- d. Chloride content in water.

Ans: a

Q. 17. The slimy and loose deposits of precipitated salts in a boiler tube is known as \_\_\_\_\_.

- a. Scale
- b. Sludge
- c. Priming
- d. Carry over

Ans: b

Q. 18. Carry over is the alternative name for \_\_\_\_\_.

- a. Sludge formation
- b. Corrosion
- c. Scale formation
- d. Priming and foaming

Ans: d

Q. 19. The hard and strong coating formed inside the boiler tube by chemical reaction is called as \_\_\_\_\_.

- a. Sludge
- b. Scale
- c. Carry over

d. Hard water

Ans: b

Q. 20. Normally sludge formation is towards the \_\_\_\_\_ parts of the boiler tube.

- a. Hotter
- b. Bottom
- c. Cooler
- d. Middle

Ans: c

Q. 21. The fast corrosion of boiler caused by highly alkaline condition of water is called as \_\_\_\_\_.

- a. Osmosis
- b. Evaporation
- c. Precipitation
- d. Caustic embrittlement

Ans: d

Q. 22. Caustic embrittlement can be avoided by treating boiler feed water with \_\_\_\_\_.

- a. Sodium carbonate
- b. Sodium phosphate
- c. Sodium chloride
- d. Sodium sulphate

Ans: b

Q. 23. Scales are generally formed at \_\_\_\_\_ parts of the boiler tube.

- a. Upper
- b. Side
- c. Hotter
- d. Middle

Ans: c

Q.24.Scale forming salts like  $\text{CaSO}_4$ ,  $\text{Mg}(\text{HCO}_3)_2$  in the boiler water can be converted into highly soluble complexes by adding \_\_\_\_\_.

- a. Calgon

b.  $\text{MgSO}_4$

c.  $\text{Na}_2\text{CO}_3$

d.  $\text{CuSO}_4$

Ans: a

Q.25.By adding \_\_\_\_\_ at a boiler temperature, it is possible to form gelatinous precipitate of scale and sludge forming salts.

- a. Sodium carbonate
- b. Sodium sulphate
- c. Sodium aluminate
- d. Sodium hydroxide

Ans: c

Q. 26. By using \_\_\_\_\_ chelating compound scales and sludges can be converted into soluble complexes.

- a.  $\text{Na}_2\text{CO}_3$
- b. EDTA
- c.  $\text{Na}_2\text{PO}_4$
- d.  $\text{CaCO}_3$

Ans: b

Q. 27. The following treatment of water is internal treatment.

- a. Zeolite
- b. Ion Exchange process
- c. Calgon conditioning
- d. Osmosis

Ans: c

Q. 28. The other name of zeolite process is \_\_\_\_\_ process.

- a. Ion exchange
- b. Permutit
- c. Demineralization
- d. Coagulation

Ans: b

Q. 29. Sodium zeolite is actually \_\_\_\_\_.

- a. Sodium Silicate

- b. Aluminium Silicate
- c. Calcium Silicate
- d. Hydrated Sodium Alumino Silicate

Ans: d

Q.30. Exhausted zeolite bed can be regenerated by \_\_\_\_\_.

- a. 5% NaCl
- b. 10 % NaCl
- c. 100 % NaCl
- d. 20 % NaCl

Ans: b

Q. 31. Brine is nothing but \_\_\_\_\_.

- a. 5% NaCl
- b. 10 % NaCl
- c. 100 % NaCl
- d. 20 % NaCl

Ans: b

Q. 32. Zeolites are \_\_\_\_\_ like structures.

- a. Square
- b. Triangular
- c. Honey Comb
- d. Pyramid

Ans: c

- c. Deionization
- d. Osmosis

Ans: c

Q. 37. By using Ion Exchange process \_\_\_\_\_ can be exchanged.

- a. Cations
- b. Anions
- c. Cations and anions both
- d. None of these

Ans: c

Q. 38. The exhausted cation exchanger can be regenerated by \_\_\_\_\_.

Q. 33. Zeolite is basically \_\_\_\_\_ process.

- a. Cation Exchange
- b. Anion Exchange
- c. Water Exchange
- d. Ion Exchange

Ans: a

Q. 34. Zeolite process can not be used for water containing \_\_\_\_\_ impurities.

- a. Dissolved
- b. Biological
- c. Suspended
- d. Colloidal

Ans: d

Q. 35. 8 % NaCl solution means \_\_\_\_\_.

- a. 8 g/lit
- b. 80 g/lit
- c. 0.8 g/lit
- d. 0.08 g/lit

Ans: b

Q. 36. Other name of Ion Exchange process is \_\_\_\_\_.

- a. Permutite
- b. Zeolite
- a. NaCl
- b. Dil. HCl
- c. KCl
- d.  $\text{CaCl}_2$

Ans: b

Q. 39. The exhausted anion exchange resins can be regenerated by \_\_\_\_\_.

- a. Dil. NaOH
- b.  $\text{Ca(OH)}_2$
- c. KOH
- d.  $\text{CaSO}_4$

Ans: a

Q. 40. In EDTA vs hard water titration, the indicator used is \_\_\_\_\_.

- a. Phenolphthalein
- b. EBT
- c. Methyl orange
- d. Fluorescein

Ans: b

Q. 41. The colour of the metal-EDTA complex is \_\_\_\_\_.

- a. Colourless
- b. Wine red
- c. Blue
- d. Yellow

Ans: a

Q. 42. The colour of metal-EBT complex is \_\_\_\_\_.

- a. Colourless
- b. Wine red
- c. Blue
- d. Yellow

Ans: b

Q. 43.  $\text{Na}_2\text{EDTA}$  is \_\_\_\_\_ dentate ligand.

- a. Bi
- b. Tri
- c. Tetra
- d. Hexa

Ans: d

Q. 44. In EDTA-hard water titration along with indicator \_\_\_\_\_ is added.

- a. HCl
- b. Buffer
- c. NaOH
- d.  $\text{HNO}_3$

Ans: b

Q. 45. In EDTA titration by adding buffer solution \_\_\_\_\_ maintained.

- a. Alkalinity
- b. Acidity
- c. pH
- d. Neutrality

Ans: c

Q. 46. In alkalinity titration, first end point is called as \_\_\_\_\_ end point.

- a. Phenolphthalein
- b. EBT
- c. Methyl orange
- d. Fluorescein

Ans: a

Q. 47. In alkalinity experiment, phenolphthalein end point is \_\_\_\_\_.

- a. Colourless to pink
- b. Pink to colourless
- c. Yellow to red
- d. None of these

Ans: b

Q. 48. In alkalinity titration, second end point is called as \_\_\_\_\_ end point.

- a. Phenolphthalein
- b. EBT
- c. Methyl orange
- d. Fluorescein

Ans: c

Q. 49. In alkalinity experiment, methyl orange end point is \_\_\_\_\_.

- a. Colourless to pink
- b. Pink to colourless
- c. Yellow to red
- d. None of these

Ans: c

Q. 50. If  $P = 0$ , then \_\_\_\_\_ alkalinities are present.

- a.  $\text{OH}^-$
- b.  $\text{HCO}_3^{--}$
- c.  $\text{CO}_3^{--}$
- d.  $\text{OH}^-$  and  $\text{CO}_3^{--}$

Ans: b

Q. 51. If  $P = \frac{1}{2} M$ , then \_\_\_\_\_ alkalinities are present.

- a.  $\text{OH}^-$
- b.  $\text{HCO}_3^{--}$
- c.  $\text{CO}_3^{--}$
- d.  $\text{OH}^-$  and  $\text{CO}_3^{--}$

Ans: c

Q. 52. If  $P = M$ , then \_\_\_\_\_ alkalinities are present.

- a.  $\text{OH}^-$
- b.  $\text{HCO}_3^{--}$
- c.  $\text{CO}_3^{--}$
- d.  $\text{OH}^-$  and  $\text{CO}_3^{--}$

Ans: a

Q. 53. If  $P < \frac{1}{2} M$ , then \_\_\_\_\_ alkalinities are present.

- a.  $\text{OH}^-$
- b.  $\text{HCO}_3^{--}$
- c.  $\text{CO}_3^{--}$
- d.  $\text{HCO}_3^{--}$  and  $\text{CO}_3^{--}$

Ans: d

Q. 54. If  $P > \frac{1}{2} M$ , then \_\_\_\_\_ alkalinities are present.

- a.  $\text{OH}^-$
- b.  $\text{HCO}_3^{--}$
- c.  $\text{CO}_3^{--}$
- d.  $\text{OH}^-$  and  $\text{CO}_3^{--}$

Ans: d

Q. 55. Determination of Alkalinity is \_\_\_\_\_ type of titration.

- a. Precipitation
- b. Redox
- c. Complexometric
- d. Acid-base

Ans: d

Q.56. Hardness determination is \_\_\_\_\_ type of titration.

- a. Precipitation
- b. Redox
- c. Complexometric
- d. Acid-base

Ans: c

Q. 57. The process of removing \_\_\_\_\_ from water is called Desalination.

- a. KCl
- b. NaCl
- c.  $\text{CaCl}_2$
- d.  $\text{BaCl}_2$

Ans: b

Q. 58. In \_\_\_\_\_ method concentration of brine decreases by applying direct electric current.

- a. Ion exchange
- b. Zeolite
- c. Electrodialysis
- d. Osmosis

Ans: c

Q. 59. Desalinated brine is removed from \_\_\_\_\_ compartment.

- a. Central
- b. First
- c. Last
- d. None of these

Ans: a

Q. 60. In osmosis flow of liquid is from \_\_\_\_\_ solution.

- a. Dilute to concentrated
- b. Concentrated to dilute
- c. Top to bottom
- d. None of these

Ans: a

Q. 61. In reverse osmosis flow of liquid is from \_\_\_\_\_ solution.

- a. Dilute to concentrated
- b. Concentrated to dilute
- c. Top to bottom
- d. None of these

Ans: b

Q. 62. In reverse osmosis the direction of the flow is getting reversed as hydrostatic pressure is \_\_\_\_\_ than osmotic pressure.

- a. Low
- b. Very low
- c. Greater
- d. None of these.

Ans: c

Q. 63. In osmosis process, after completion, in the tank \_\_\_\_\_ is present.

- a. Pure water
- b. Mixture
- c. Contaminated water
- d. None of these

Ans: c

Q. 64. Alkalinity of water is due to \_\_\_\_\_.

- a.  $\text{OH}^-$
- b.  $\text{CO}_3^{2-}$
- c.  $\text{HCO}_3^-$
- d. All of these

Ans: d

Q. 65. In reverse osmosis, \_\_\_\_\_.

- a. Sewage water is purified
- b. Industrial waste water is purified
- c. Sea water is purified
- d. River water is purified

Ans: c

Q. 66. Reverse osmosis is also known as \_\_\_\_\_.

- a. Super filtration
- b. Hyper filtration
- c. Pressure filtration
- d. Molecular sieve filtration

Ans: b

Q. 67. Electrodialysis is a method adopted to \_\_\_\_\_.

- a. Remove high concentration of ions in saline water
- b. Remove pathogenic bacteria
- c. Remove salts
- d. Purify water

Ans: a

Q. 68. Salts responsible for hardness are in \_\_\_\_\_ form.

- a. Insoluble
- b. Soluble
- c. Partly soluble
- d. None of these

Ans: b

Q. 69. Carbonate hardness = \_\_\_\_\_ hardness.

- a. Permanent
- b. Mild
- c. Temporary
- d. None of these



Ans: c

Q. 70. Unit for hardness is \_\_\_\_\_ = ppm.

- a. gm / lit
- b. lit/gm
- c. mg/lit
- d. mg/ml

Ans: c

Q. 71. Due to scale and sludge deposition in boiler efficiency of boiler \_\_\_\_\_.

- a. Increases
- b. Decreases
- c. Remains same
- d. All of these

Ans: b

Q. 72. In EDTA method, buffer solution is used to make water alkaline is a mixture of \_\_\_\_\_ + \_\_\_\_\_.

- a.  $\text{NH}_4\text{Cl} + \text{NH}_4\text{OH}$
- b.  $\text{NH}_4\text{Cl} + \text{H}_2\text{O}$

c.  $\text{NH}_4\text{OH} + \text{KCl}$

d. All of these

Ans: a

Q. 73. In EDTA method, pH of the buffer solution is \_\_\_\_\_.

- a. 5
- b. 8
- c. 10
- d. 7

Ans: c

Q. 74. To remove \_\_\_\_\_ impurities from water internal/external treatments are to be given.

- a. Colloidal
- b. Suspended
- c. Biological
- d. Dissolved

Ans: b

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