

B.Sc. (NEP Pattern) Semester-I
SEC04 - Chemistry - Water Treatment-I

P. Pages : 3

Time : Two Hours



GUG/W/24/15908(S)

Max. Marks : 40

1. A) Select the correct alternatives.

2x10

=20

i) Pure Water is

- a) Colourless
- c) Taste Less

- b) Odourless
- d) All the above

ii) Earth's surface covered by water is

a) $\frac{1}{3}$

b) $\frac{2}{3}$

c) $\frac{3}{2}$

d) $\frac{5}{2}$

iii) Sources of water is

- a) Surfaces water
- b) Underground water
- c) Both surface and ground water
- d) None of the above

iv) Surface water includes

- a) River water
- b) Rain water
- c) Pond water
- d) All the above

v) Impurities present in water are in the form of

- a) Dissolved
- b) Colloidal
- c) Suspended
- d) All the above

vi) Temporary hardness is due to presence of soluble

- a) Bicarbonate of Ca and Mg
- b) Carbonate of Ca and Mg
- c) Hydroxide of Ca and Mg
- d) All the above

vii) Permanent hardness is due to

- a) CaSO_4
- b) CaCO_3
- c) $\text{Mg}(\text{OH})_2$
- d) $\text{Mg}(\text{HCO}_3)_2$

viii) Hardness of water of expressed in

- a) Parts per million
- b) Degree centigrade
- c) Parts per thousand
- d) Parts per hundred

ix) The hardness that can be removed by boiling is called

- a) Temporary hardness
- b) Permanent hardness
- c) Semi permanent hardness
- d) Semi Temporary hardness

- x) Hardness of water is conventionally expressed in term of equivalent amount of
- | | |
|----------------------------|-----------------------------|
| a) H_2CO_3 | b) MgCO_3 |
| c) CaCO_3 | d) Na_2CO_3 |

OR

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| B) Explain in detail about sources of water. | 5 |
| C) Discuss different type of impurities present in water. | 5 |
| D) What is hardness? Give causes of hardness. | 5 |
| E) Explain the types of hardness. Also explain its units. | 5 |

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| 2. A) Select the correct alternatives. | 2x10
=20 |
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- i) Softening of water can be carried out by

a) Cold lime soda process
b) Ho lime soda process
c) Both cold and hot lime soda process
d) None of the above

- ii) In lime soda process, lime is

a) $\text{Ca}(\text{OH})_2$	b) CaCO_3
c) $\text{Mg}(\text{OH})_2$	d) $\text{Mg}(\text{HCO}_3)_2$

- iii) The formula for soda is

a) NaHCO_3	b) $\text{Ca}(\text{HCO}_3)_2$
c) Na_2CO_3	d) CaCO_3

- iv) The coagulants used in cold lime soda process is

a) NaAlO_2	b) Na_2AlO_3
c) NaAl_2O_3	d) MgAlO_2

- v) Which water source is least likely to be influenced by surface pollution?

a) River	b) Well
c) Lake	d) Reservoir

- vi) The technique used in cold lime soda process are

a) Batch process	b) Conventional type
c) Sludge Blanket type	d) All the above

- vii) Hot lime soda process involves the heating of water with softening chemical at temperature.

a) 80 to 150°C	b) 50 to 60°C
c) 30 to 50°C	d) None of the above

viii) Which of the following is natural zeolite

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|---------------|------------------|
| a) Natrolite | b) Thomsonite |
| c) Laumontite | d) All the above |

ix) Cation exchange resin contains

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|--------------|---------------|
| a) Hydroxide | b) Carboxylic |
| c) Sulphate | d) Chloride |

x) Anion exchange resin contains

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|--------------|---------------|
| a) Sulphonic | b) Carboxylic |
| c) Sulphate | d) Phenolic |

OR

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|--|----------|
| B) Explain cold lime soda process for softening of water. | 5 |
| C) Discuss advantages and dis-advantages of hot lime soda process. | 5 |
| D) Explain Zeolite process for the softening of water. | 5 |
| E) Explain: | 5 |
| i) Cation exchange resin. | |
| ii) Anion exchange resin. | |
