Part – A

Unit-I

1. What are the main objectives of treating water? (Apr/May-2011)
(i) To remove colour, dissolved gases, and murkiness of water
(ii) To remove objectionable tastes and odour
(iii) To remove disease producing micro organism to provide safe drinking water
(iv) To remove hardness of water
(v) To make water suitable for many industrial purposes brewing, dyeing and steam generation

2. Enumerate the components of a water supply scheme. (Apr/May-2011) (Apr/May-2013)
Collection works, Treatment works, Transmission works, Distribution works

3. What is Design Period? List any two factors influencing it. (Nov/Dec-2011) (Nov/Dec-2012) (Nov/Dec-2013) (Nov/Dec-2010)
This time after completion of the project is called "design period". It is expressed in years. During design period, the structures, equipment and components should be adequate to serve the requirements. As per normal procedure water works is designed for a period of 30 years.

Influencing factors:
i) Useful life of pipes, equipment and structures.
ii) The anticipated rate of growth. If rate is more, design period will be less.
iii) The rate of inflation during the period of repayment of loans when inflation rate is high, a longer design period is adopted.
iv) Efficiency of component units. The more the efficiency, the longer will be design period.

4. State the Purposes of carrying out water quality characterisation? (Nov/Dec-2011)
o   To identify physical, chemical and biological characteristic nature of water
o   To analyse the water quality in comparison with drinking water standards
o   To identify water quality for recommendation of treatment methods
o   To identify pollution levels in water for protecting water sources

5. List out the various water demand encountered in society? (Apr/May-2012)
Domestic demand, Public demand, Industrial demand, Commercial demand, Fire demand, losses and wastes

6. What are the assumptions in an incremental increase method to forecast population? (Apr/May-2012)
Growth rate is assumed to be progressively increasing or decreasing, depending upon whether the average of the incremental increases in the past is positive or negative. The population for a future decade is worked out by adding the mean arithmetic increase to the last known population as in the arithmetic increase method and to this is added the average of incremental increases, once for first decade, twice for second and so on.
$P_n = P + nI + (n(n+1)/2)*r$

7. What is the objective of water supply scheme? (Nov/Dec-2012) (Nov/Dec-2013)(Nov/Dec-2014)

(i) To supply safe and wholesome water to consumers

(ii) To supply water in adequate quantity

(iii) To make water easily available for encouraging personal and household cleanliness.

8. What are the acceptable quality standards as per BIS 10500: 1983 for flouride and nitrates? (Apr/May-2013)

Flourides – 1 mg/l, Nitrates – 45 mg/l

9. How to determine the storage need for an impounding reservoir? (Apr/May-2014)

Mass curve diagram method

Analytical calculation method

10. Distinguish carbonate and non carbonate hardness? (Nov/Dec-2014)

Carbonate hardness	non carbonate hardness
Caused by carbonate and bicarbonate salts of calcium and magnesium	Caused by sulphates and chlorides of calcium and magnesium salts
Causes temporary hardness	Causes permanent hardness
Removed by heating and excess lime treatment	Removed by special water softening methods

11. Distinguish between Shallow and deep well? (Apr/May-2015)

Shallow well	Deep well
A shallow well is one where the primary source of water is an unconfined aquifer	A deep well is one which is having water supply from a confined aquifer
Withdraws water from ground water table and rain water percolates through soil to improve yield in well	Withdraws water from deep under ground water table