Diploma in Civil Engineering

Term-End Examination

June, 2011

BCE-033 : ENVIRONMENTAL ENGINEERING

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt **five** questions in all. Q. No. **1** is **Compulsory**. All questions carry **equal** marks.*

1. (a) The average domestic consumption of water under normal conditions in an Indian city per day person is : **14x1=14**

(i) 105 litres (ii) 115 litres

(iii) 125 litres (iv) 135 litres

(v) 150 litres

(b) Ground water is usually free from :

(i) suspended impurities.

(ii) dissolved impurities.

(iii) both (i) and (ii)

(iv) none of these.

(c) The usual life of cast iron pipes under normal conditions are about :

(i) 25 years (ii) 50 years

(iii) 100 years (iv) 150 years

(v) 75 years

(d) Turbidity of water may be caused due to :

(i) suspended clay

(ii) suspended silt

(iii) finely divided organic material

(iv) all of above

(e) The standard B.O.D at 20°C is taken for consumption on :

(i) one day (ii) 3 days

(iii) 4 days (iv) 5 days

(f) Hardness of water is caused due to :

(i) Calcium sulphates

(ii) Magnesium sulphates

(iii) Calcium nitrates

(iv) Calcium bicarbonates

(v) All of above

(g) A water having pH less than 7, is :

(i) Acidic (ii) Alkaline

(iii) Neutral (iv) All of above

(v) None of these

(h) Disinfection of water helps in :

(i) Removing turbidity

(ii) Removing hardness

(iii) Killing pathogenic bacteria

(iv) Complete sterilisation

(i) Minimum D.O prescribed for a river stream, to avoid fish kills is :

(i) 2 ppm (ii) 4 ppm

(iii) 8 ppm (iv) 10 ppm

(j) The suitable layout for a water supply distribution system, for a city of roads of rectangular pattern is :

(i) Dead end system

(ii) Grid system

(iii) Ring system

(iv) Radial system

(k) The detention period adopted for grit chamber is of the order of :

(i) 1 minute (ii) 5 minutes

(iii) 2 - 4 hours (iv) 10 - 12 hours

(l) Facultative bacterias survive in :

(i) the presence of oxygen

(ii) the absence of oxygen

(iii) both (i) and (ii)

(iv) Neither (i) nor (ii)

(m) Lower F/M value in activated sludge treatment plant means :

(i) lower BOD removal

(ii) higher BOD removal

(iii) No effect on BOD removal

(n) The sewer which transports the sewage to the point of treatment is called :

(i) house sewer

(ii) main sewer

(iii) out fall sewer

(iv) none of these

2. (a) What is meant by the fluctuations in water demand ? Explain how the peak demands are opened ? 3+4=7

(b) List the commonly used surface and ground water sources. How will you select a source of water for a water supply scheme ? 7

3. (a) Differentiate between "Grab" and "Composite" method of collecting water samples ? What precautions would you take while collecting water samples ? 4+3=7

(b) Discuss the methods used to determine the microbiological quality of water. 7

4. (a) Explain the principle of coagulation. Mention the chemical reactions in using Alum and Lime as coagulants. 3+4=7

(b) What do you understand by the term "Disinfection" ? Enumerate the factors affecting it. 2+5=7

5. (a) With the help of a neat sketch explain the working of Jet pump. 7

(b) Name the various appurtenances used in house water connection. Draw a neat sketch of pipe assembly showing common pipe sizes and most common fittings. 3+4=7

6. (a) Using a suitable diagram discuss the functioning of ventilators used in the sewerage system. 7

(b) With the help of a neat sketch describe the principle involved in the design and construction of Grit Chamber. 7

7. Write short notes on ***any four*** of the following : 4x3½=14

(a) Artesian well

(b) Alkalinity of water

(c) Flanged Joint

(d) Bib cocks

(e) Sludge Balking

(f) Ion - Exchange method of water softening.