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BCE-033

Diploma in Civil Engineering

Term-End Examination

December, 2011

00772

BCE-033 : ENVIRONMENTAL ENGINEERING

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt **five** questions in all. All questions carry **equal marks.** Q. no. 1 is **compulsory**. Assume any missing data,if any,suitably.*

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1. Choose the most appropriate alternative in the following questions. **14x1=14**

(a) The average domestic water consumption per capita per day for an Indian city provided with piped water supply and sewage system is taken as :

(i) 135 l/c/d. (ii) 210 l/c/d.

(iii) 240 l/c/d. (iv) 270 l/c/d.

(b) Which source of water, among the following, is not an underground water source ?

(i) Wells (ii) Rivers

(iii) Springs (iv) Infiltration galleries

(c) Higher values of pH indicates :

(i) strong acids.

(ii) strong alkalies.

(iii) higher pathogens.

(iv) None of the above.

(d) Which of the following is used to determine colour of water ?

(i) Turbidity meter.

(ii) Nanometer.

(iii) Tintometer.

(iv) None of these.

(e) The most widely used coagulant for water treatment is :

(i) lime and soda

(ii) ferrous sulphate.

(iii) chlorinated copperas.

(iv) alum.

(f) Disinfection of water helps in :

(i) removing turbidity.

(ii) removing hardness.

(iii) killing pathogen bacteria.

(iv) complete sterilisation.

(g) Which of these is not a bacterial disease ?

(i) Cholera (ii) Typhoid

(iii) Jaundice (iv) Bacillary dyscentry

(h) Which of these statements is correct ?

(i) BOD > COD (ii) BOD < COD

(iii) BOD = COD (iv) None of these

(i) The activated sludge process is :

(i) attached growth aerobic process

(ii) attached growth anaerobic process.

(iii) suspended growth aerobic process.

(iv) suspended growth anaerobic process.

(j) Water - tap used in the houses is also known as :

(i) Sluice - tap. (ii) Ferrule.

(iii) Stop cock. (iv) Bib cock.

(k) Waste water coming from bathrooms and kitchen is popularly known as :

(i) domestic sewage discharge.

(ii) drainage discharge

(iii) sullage discharge.

(iv) sludge discharge.

(l) Detention period (t) for a rectangular sedimentation tank, passing discharge Q and having length = L, width = B and depth = H is given by :

(i) $\frac{B \times L \times H}{Q}$ (ii) $\frac{Q}{B \times L \times H}$

(iii) $\frac{Q}{B \times L}$ (iv) None of the above.

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

(i) House sewer.

(ii) Main sewer

(iii) Outfall sewer.

(iv) None of the above.

(n) A suitable layout for a water supply distribution system , for a city having roads making rectangular pattern is :

(i) Dead end system.

(ii) Grid system.

(iii) Ring system.

(iv) Radial system.

2. (a) Name three techniques to estimate the microbiological quality of water. What is MPN ? Discuss its use in water quality analysis. 7

(b) Enumerate guidelines to be followed while collecting water samples. 7

3. (a) Enlist various surface and ground water sources. Describe any one out of these. 7

(b) List various factors which are considered for taking a decision on design period of water supply schemes. 7

4. (a) Explain , in brief, water treatment processes covered under pre - treatment. 7

(b) Differentiate between coagulation and flocculation. 7

5. With the help of a flow diagram describe the working of an Aerobic Sludge Digester. Also discuss the relative advantages and disadvantages of aerobic and anaerobic sludge digestion process. 14

6. (a) What are basic components of a sanitary sewer system ? 7

(b) Distinguish between sanitary sewer and storm drainage system. 7

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

(a) Turbidity.

(b) Water Hardness.

(c) Water borne disease

(d) Jet pumps

(e) Hydraulic Ram

(f) Break Point chlorination

(g) Spigot and socket joint