DIPLOMA IN CIVIL ENGINEERING
DCLE(G) / DCLEVI
Term-End Examination
December, 2015

BCE-033 : ENVIRONMENTAL ENGINEERING

Time : 2 hours   *Maximum Marks : 70*

Note : *Attempt **five** questions in all. Question no. **1** is **compulsory**. All questions carry equal marks. Use of scientific calculator is allowed.*

1. Choose the correct answer.   *7×2=14*

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

         (i) Wells

         (ii) Rivers

         (iii) Springs

         (iv) Infiltration galleries

    (b) Using Kuichling formula, fire demand is calculated as

         (i) $Q = 2182 \sqrt{P}$

         (ii) $Q = 2182 \, P^{3/2}$

         (iii) $Q = 3182 \sqrt{P}$

         (iv) None of these

(c) Bacteria which require oxygen for survival are called

(i) aerobic

(ii) anaerobic

(iii) facultative

(iv) None of these

(d) Surface loading or overflow rate of sedimentation tank, passing a discharge Q and having length = L, depth = D and width = B is given by

(i) $\dfrac{Q}{B \times D}$

(ii) $\dfrac{Q}{B \times L}$

(iii) $Q \times B \times L$

(iv) $\dfrac{Q}{B \times D \times L}$

(e) Hypochlorite ions are more effective in removing bacteria than hypochlorous acid. This statement is

(i) True

(ii) False

(f) Standard B.O.D. is the B.O.D. after

(i) 1 day

(ii) 5 days

(iii) 10 days

(iv) None of these

(g) To collect sand, grit, debris, etc. from storm water, _____ are provided.

   (i) manholes

   (ii) inverted siphons

   (iii) catch basins

   (iv) None of these

2. (a) An artesian well has a diameter of 20 cm. The thickness of the aquifer is 30 m and its permeability is 36 m/day. Find its yield under a drawdown of 4 m at the well face. Radius of influence is 245 m. **7**

   (b) Define average daily per capita demand and list the factors affecting it. **7**

3. (a) Define and explain (i) Surface loading, and (ii) Detention period. **7**

   (b) Explain sedimentation with coagulation. **7**

4. Draw a neat sketch of a rapid gravity filter and describe how it works. *14*

5. (a) What are manholes ? Explain with a neat sketch. **7**

   (b) Explain anaerobic sludge digestion using digestion tank. **7**

6. Give the flow diagram of activated sludge process and describe its working. *14*

7. Write short notes on any *four* of the following : $4\times3\frac{1}{2}=14$

(a) MPN Test

(b) Water-borne Diseases

(c) Break Point Chlorination

(d) B.O.D.

(e) Inverted Siphon

(f) Dissolved Oxygen (D.O.)

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