BCE-033

DIPLOMA IN CIVIL ENGINEERING DCLE(G) / DCLEVI

Term-End Examination

June, 2018

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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.*

1. Choose the correct answer from the given alternatives.   *14×1=14*

   (a) The multiplying factor, as applied to obtain the peak hourly demand, in relation to the maximum daily demand is

   (i) 1·5

   (ii) 1·8

   (iii) 2·0

   (iv) 2·7

(b) Ground water is usually free from

    (i) suspended impurities

    (ii) dissolved impurities

    (iii) Both (i) and (ii)

    (iv) None of these

(c) The temporary hardness of water can be removed by

    (i) flotation

    (ii) boiling

    (iii) sedimentation

    (iv) adding alum

(d) Bio-chemical Oxygen Demand (BOD) of safe drinking water must be

    (i) 20

    (ii) 50

    (iii) 135

    (iv) zero

(e) To remove very fine suspended particles from water, the method adopted is

(i) screening

(ii) sedimentation

(iii) boiling

(iv) filtration

(f) The most commonly used disinfectant for drinking water is

(i) Alum

(ii) Lime

(iii) Chlorine

(iv) Ammonia

(g) The interlaced system of layout of distribution of pipes is also known as

(i) dead end system

(ii) grid system

(iii) ring system

(iv) radial system

(h) The gas which may cause explosion in sewers is

(i) CO_2

(ii) NH_3

(iii) CH_4

(iv) CO

(i)   The cast iron pipes are generally preferred because of

   (i)   moderate cost

   (ii)   durability

   (iii)   longer life

   (iv)   All of the above

(j)   The water meter, which is installed in individual house connection in municipal supplies is

   (i)   velocity meter

   (ii)   inferential meter

   (iii)   displacement meter

   (iv)   None of the above

(k)   The by-products, which are generally evolved during aerobic decomposition of sewage are

   (i) $CO_2 + NH_3 + H_2O$

   (ii) $CO_2 + NH_3 + H_2S + CH_4$

   (iii) $CO_2 + NH_3 + SO_2$

   (iv) $CO_2 + NH_3 + SO_2 + CH_4$

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(l) The detention period normally adopted for stabilization ponds is of the order of

(i) 1 – 2 hours

(ii) 24 – 36 hours

(iii) 2 – 4 days

(iv) 30 – 120 days

(m) Lower F/M value in a conventional activated sludge treatment plant will mean

(i) lower BOD removal

(ii) higher BOD removal

(iii) no effect on BOD removal

(n) Which of the following pairs is *not* correctly matched :

(i) BOD - strength of sewage

(ii) Methane - product of anaerobic decomposition

(iii) COD - biodegradability of wastewater

(iv) Colour - platinum cobalt scale

2. (a) Name the tests that are normally conducted to assess the physical characteristics of water. How will you measure the turbidity of a water sample ? 7

(b) Discuss the factors that are normally taken into consideration for selecting the source of water for a town. 7

3. (a) Define 'Detention period' and 'Overflow rate' in the context of sedimentation tanks. *6*

    (b) Differentiate between 'disinfection' and 'sterilization' processes. Also discuss the factors which govern the process of disinfection. *8*

4. (a) What do you understand by the term 'water softening' ? Discuss in detail the 'Excess Lime-Soda' method of water softening. *7*

    (b) List the various patterns of layouts adopted for water distribution in India and discuss any one of these in detail. *7*

5. (a) Differentiate between 'Total Dissolved Solids', 'Total Volatile Solids' and 'Total Suspended Solids'. *6*

    (b) What is an Inverted Siphon ? With the help of a neat sketch describe the components of an inverted siphon. *8*

6. (a) With the help of a flow diagram describe the essentials of activated sludge process. *7*

    (b) Discuss the advantages and disadvantages of anaerobic and aerobic sludge digestions. *7*

7. Write short notes on any *four* of the following : $4 \times 3\frac{1}{2} = 14$

   (a) Fire Fighting Water Demand

   (b) Coagulation

   (c) Stop Cock

   (d) Crown Corrosion

   (e) Sludge Conditioning

   (f) Spigot and Socket Joint

   (g) Residual Chlorine

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