

## **Diploma in Civil Engineering**

### **Term-End Examination**

**December, 2006**

### **BCE-033 : ENVIRONMENTAL ENGINEERING**

*Time : 2 hours*

*Maximum Marks : 70*

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

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1. (a) Water treatment units are normally designed for
- (i) 50 years
  - (ii) 75 years
  - (iii) 30 years
  - (iv) 15 years
- (b) According to Kuichling formula, water required for fire-fighting is given by
- (i)  $Q = 3182 \sqrt{P}$
  - (ii)  $Q = 5182 \sqrt{P}$
  - (iii)  $Q = 2182 \sqrt{P}$
  - (iv)  $Q = 8182 \sqrt{P}$

- (c) Water having pH equal to 4.0 is
- (i) Acidic
  - (ii) Alkaline
  - (iii) Neutral
  - (iv) None of the above
- (d) Which of the following practices causes reduction in per capita water consumption ?
- (i) Good water quality
  - (ii) Sewerage system
  - (iii) Metering system
  - (iv) All of the above
- (e) Ground water is usually free from
- (i) Suspended impurities
  - (ii) Dissolved impurities
  - (iii) Both of the above
  - (iv) None of the above
- (f) Hydraulic ram works on the principle of
- (i) ejector
  - (ii) water hammer
  - (iii) centrifugal force
  - (iv) None of the above
- (g) The colour of water is usually expressed in
- (i) Nickel scale
  - (ii) Silica scale
  - (iii) Platinum-cobalt scale
  - (iv) None of the above

- (h) In sedimentation tanks, settling of impurities occurs under the action of
- (i) sun rays
  - (ii) gravitational force
  - (iii) biological action
  - (iv) None of the above
- (i) Slow sand filters can remove bacteria upto
- (i) 80 – 90%
  - (ii) 90 – 95%
  - (iii) 98 – 99%
  - (iv) None of the above
- (j) The gas which is generally found present in sewers is
- (i)  $H_2S$
  - (ii)  $CO_2$
  - (iii)  $CH_4$
  - (iv) All of the above
- (k) The primary treatment of sewage is meant for
- (i) Removal of larger suspended matter
  - (ii) Removal of fine suspended matter
  - (iii) Removal of dissolved organic matter
  - (iv) Removal of bacteria

- (l) Biochemical Oxygen Demand (BOD) of sewage is
- (i) oxygen required to oxidise biologically active organic matter
  - (ii) oxygen required to oxidise biologically inactive organic matter
  - (iii) All of the above
  - (iv) None of the above
- (m) Composting and lagooning are method of
- (i) Filtration
  - (ii) Sedimentation
  - (iii) Sludge digestion
  - (iv) Sewage disposal
- (n) The trickling filters work on the principle of
- (i) Attached growth aerobic process
  - (ii) Suspended growth aerobic process
  - (iii) Attached growth anaerobic process
  - (iv) Suspended growth anaerobic process 14
2. (i) Source of water for water supply schemes should be selected carefully. Discuss. 7
- (ii) Examine shallow and deep wells as sources of water for water supply schemes. 7
3. With the help of neat sketch, describe the working of centrifugal pumps. 14

4. What are manholes ? With the help of neat sketch discuss any two types of manholes. 14
5. Discuss the working principle of Trickling Filters. Also draw a flow diagram in schematic form of wastewater plant that includes trickling filter. 14
6. Write an essay on wastewater effluent reclamation and re-use. 14
7. Write short notes on any **four** of the following :  $3\frac{1}{2} \times 4 = 14$
- (i) Coagulation
  - (ii) Break point chlorination
  - (iii) Flanged joint
  - (iv) Testing for water pipelines
  - (v) Grit chamber
  - (vi) Rotating biological contractors
  - (vii) Sludge conditioning