

Diploma in Civil Engineering

Term-End Examination

June, 2012

02849

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. Assume missing data, if
any, suitably.*

1. Choose the most appropriate answer from the given alternatives. **1x14=14**
- (a) A water having pH more than 7 is :
- | | |
|---------------|--------------------|
| (i) acidic | (ii) alkaline |
| (iii) neutral | (iv) None of these |
- (b) Water is considered 'soft', if its hardness does not exceed :
- | | |
|---------------|--------------|
| (i) 50 ppm | (ii) 150 ppm |
| (iii) 200 ppm | (iv) 300 ppm |
- (c) The unit of turbidity is :
- | | |
|-----------|----------|
| (i) MTU | (ii) KTU |
| (iii) JTU | (iv) LTU |

- (d) An aquifer, Sandwiched between top and bottom aquicludes is commonly known as :
- (i) Non-artesian well
 - (ii) Artesian well
 - (iii) Flowing well
 - (iv) None of the above
- (e) Temporary hardness in water is due to :
- (i) Carbonates and bicarbonates of calcium and magnesium.
 - (ii) Bicarbonates of sodium and potassium.
 - (iii) Carbonates of calcium and magnesium.
 - (iv) All the above.
- (f) The bacteria which survive in absence of oxygen are called :
- (i) Anaerobic
 - (ii) Aerobic
 - (iii) Faculative
 - (iv) E. Coli
- (g) Manholes are generally located :
- (i) at all points of change of direction of sewer.
 - (ii) at all points of change of gradient of sewer.
 - (iii) at all junctions of different sewer.
 - (iv) all the above.

- (h) The gas which is generally found present in sewers is :
- (i) H_2S
 - (ii) CO_2
 - (iii) CH_4
 - (iv) All the above
- (i) The re-circulation in Activated Sludge process is done to :
- (i) dilute the incoming sewage.
 - (ii) dampers the effect of flow variation.
 - (iii) operate the plant smoothly.
 - (iv) supply the seed material to aeration tank.
- (j) 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
- (k) Which of the following may be considered as displacement pump ?
- (i) Reciprocating pump
 - (ii) Rotary pump
 - (iii) Both of the above
 - (iv) None of the above
- (l) A manhole is generally classified as deep manhole if its depth is more than
- (i) 0.9 m
 - (ii) 1.2 m
 - (iii) 1.5 m
 - (iv) 2.0 m

- (m) Water entering a rapid gravity filter has high turbidity as compared to slow sand filter.
This statement is
(i) True (ii) False
- (n) Hypochlorite ions are more effective in removing bacteria than hypochlorous acid.
This statement is.
(i) True (ii) False
2. (a) Enlist underground water sources and discuss any two of them. 7
- (b) What do you understand by domestic water requirement? Give an approximate break up of various types of water requirement, if the daily demand of water is 270 lpcd. 7
3. (a) Differentiate between coagulation and flocculation. Describe the chemical reactions for the following when used as coagulant? 7
- (i) Alum
- (ii) Ferric Sulphate
- (b) A rectangular tank with length of 18m, width of 6m and depth of 3m is to treat 3.0×10^6 ml/d of water. Calculate 7
- (i) Detention period of tank.
- (ii) Average flow velocity through the tank.
- (iii) S.O.R

4. With the help of a neat sketch describe the working of a slow sand filter. **14**
5. Discuss the working principle of activated sludge process. Also draw a flow diagram, in schematic form, of a waste water treatment plant that includes activated sludge process. **14**
6. With the help of a neat sketch, describe the main components of a Centrifugal Pump briefly. **14**
7. Write short notes on *any four* of the following : **4x3½=14**
- (a) MPN test
 - (b) Food to micro-organism ratio.
 - (c) Water borne disease
 - (d) Spigot and socket joint
 - (e) Break point chlorination
 - (f) Jet Pumps.
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