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ET-507(B)

B.Tech. Civil (Water Resources Engineering)

Term-End Examination

00489

June, 2012

ET-507(B) : WASTE WATER TREATMENT

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **six** questions in **all**. Question number **1** is **compulsory**. Use of calculator is permitted. The answers must be in your language.*

1. (a) The correct statement of comparison of ultimate BOD, COD, Theoretical oxygen demand (ThOD) and 5 day BOD (BODs) is : **10x1=10**

(i) $BOD_U > COD > ThOD > BOD_5$

(ii) $COD > ThOD > BOD_U > BOD_5$

(iii) $ThOD > COD > BOD_U > BOD_5$

(iv) $COD > BODu > BOD_5 > ThOD$

(b) The effect of increasing the diameter of sewer pipe on the self cleaning velocity is :

(i) to increase it

(ii) to decrease it

(iii) no effect

(iv) first to increase it then decrease.

(c) The pump, which permits the sewage solids to pass out with liquid sewage, without clogging the pump is a :
   (i) reciprocating pump
   (ii) centrifugal pump
   (iii) pneumatic ejector
   (iv) none of these

(d) The natural process, under which flowing river water gets cleaned, is known as :
   (i) oxidation
   (ii) self purification
   (iii) photosynthesis
   (iv) All of these

(e) The facultative bacterias survive in :
   (i) the presence of oxygen
   (ii) the absence of oxygen
   (iii) both (i) and (ii)
   (iv) none of above

(f) The activated sludge is :
   (i) The aerated sludge in the aeration tank
   (ii) The sludge settled in humus tank
   (iii) Sludge in secondary tank after aeration and becoming rich in microbial mass
   (iv) None of these

(g) Sanitary land fills may cause troubles during :
   (i) peak summer
   (ii) peak winter
   (iii) peak mansoon
   (iv) none of these

(h) The primary treatment of sewage consists of :

(i) Removal of large suspended organic solids

(ii) Removal of oil and grease

(iii) Removal of sand and grit

(iv) None of these

(i) The pH of fresh sewage is usually :

(i) Less than 7

(ii) More than 7

(iii) Equal to 7

(iv) Equal to zero

(j) The method of refuse disposal, involving blerial in trenches is called :

(i) Incineration

(ii) Pulverisation

(iii) Compositing

(iv) None of these

2. (a) What are important waste water contaiminants ? Classify them with their source and significance. 6

(b) In a aerial photographic screens of 18.0 - ha catchment following, area classification was determined as per following description : 6

(i) Flat densely wooded = 8.0 ha; c = 0.01

(ii) lawn = 7.3 ha; c = 0.2

(iii) paved roadway and parking area = 2.7 ha; c = 0.90

Complete the composite runoff coefficient (k) for the total area of the catchment.

3. (a) With the help of suitable diagram, discuss the mechanism of working of swimmimg tank. 6

(b) Design a circular setting tank unit for a primary treatment of sewage at 12 million Litres per day. Assume suitable values of detention period (Assuming that trickling filters are to follow the sedimentation tank) and surface loading. 6

4. (a) Define Bio - chemical oxygen demand. What is it's importance in sewage treatment ? 6

(b) How will you examine the sewage for the presence of various kinds of solids ? 6

5. (a) What is meant by Activated sludge ? With the help of line diagram describe the waste water treatment by activated sludge process. 6

(b) Discuss the properties of sludge produced from the various wastewater, treatment units. 6

6. (a) Discuss various methods for treatment and disposal of septage with the help of a line diagram. 6

(b) A sewage sludge having volume V_1 contains moisture content P_1%. What will be the volume of this sludge if it's moisture content is reduced to P_2% ? 6

7. (a) With the help of neat sketch, discuss the working of Air Flotation Thickness. **6**

(b) Discuss the advantages and disadvantages of using wastewater for irrigation purposes. **6**

8. (a) Using a neat sketch, describe the working of pneumatic Ejector. **6**

(b) What is Manhole ? Discuss its working with the help of neat sketch. **6**

9. Write short notes on ***any four*** of following : **4x3=12**

(a) Self cleaning velocity

(b) Sludge volume Index

(c) Gulley Trap

(d) Lagoons

(e) Composting

(f) Screens

(g) Anaerobic Digester