B.Tech. Civil (Construction Management) / B.Tech. Civil (Water Resources Engineering)

Term-End Examination
June, 2012

01579

ET-507(A) : POLLUTANTS AND WATER SUPPLY

Time : 3 hours　　　　　　　　　*Maximum Marks : 70*

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

1. (a) The primary air pollutant, which is formed due to incomplete combustion of organic matter, is :　　　　　10x1=10
    (i) methane
    (ii) sulphur dioxide
    (iii) ozone
    (iv) carbon monoxide

   (b) Chances of development of an ozone hole are more at :
    (i) Arctic and Antarctic regions
    (ii) Equatorial regions
    (iii) Regions of Mid latitude
    (iv) None of these

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(c) Underground water can be obtained from :

    (i)   rivers   (ii)   rains

    (iii) reservoirs   (iv) springs.

(d) If y is the specific weight of water in kg/m^3, Q is discharge in m^3/sec, H is total Head in meter ; the required horse power of the pump is :

    (i) $\dfrac{YQH}{365}$ (ii) $\dfrac{YQH}{75}$

    (iii) $\dfrac{365}{YQH}$ (iv) $\dfrac{75}{YQH}$

(e) Priming of centrifugal pump is necessary :

    (i)   If it is located above the reservoir level

    (ii)   If it is located below the reservoir level

    (iii) If it is located at reservoir level

    (iv) If delivery head is high

(f) Wholesome water is the one, which does not contain ?

    (i)   Pathogenic bacteria.

    (ii)   Suspended matter in quantities harmful to man.

    (iii) Dissolved matter in quantities harmful to man.

    (iv) All of above.

(g) A flowing well is essentially :

 (i) An artesian well

 (ii) A non-artesian well

 (iii) A gravity well

 (iv) None of these

(h) A sluice valve is also known as :

 (i) air-inlet valve

 (ii) scour valve

 (iii) gate valve

 (iv) None of these

(i) A water sample having pH equal to 7 is :

 (i) Acidic (ii) Alkaline

 (iii) Neutral (iv) None of these

(j) The suitable method for disinfection of, swimming pool water is :

 (i) Ultra violet rays treatment

 (ii) Lime treatment

 (iii) Chlorination

 (iv) Use of pottasium permanganate

2. (a) What is Green House Effect ? Discuss it's effect on global environment. **6**

 (b) Recovery and recycling of Solid waste plays important role in the solid waste management. Discuss. **6**

3. (a) With the help of suitable diagram discuss **6** the working mechanism of a Jet Pump.

   (b) What do you understand by Chemical **6** Oxygen Demand (COD) ? Why is it always higher than Bio-chemical Oxygen Demand (BOD) ?

4. (a) Discuss any two tests commonly used to **6** estimate the microbiological quality of water.

   (b) What is peak hour demand and how does it **6** affect the design of water supply system ?

5. (a) Derive an expression for determining **6** discharge from an unconfined aquifer.

   (b) The average daily demand of a town has **6** been estimated as 10 million litres per day. Design a suitable sedimentation tank, assuming a detention period of 5 hrs and velocity of flow as 22 cm per minute.

6. With the help of neat sketch describe the working **12** of pressure filter. Discuss the relative merits of Pressure Filter and Rapid Gravity filters indicating the conditions favourable for the choice of each.

7. (a) Discuss the relative merits and demerits of **6** Lime-soda process and zeolite process used in water softening.

(b) Calculate the storage capacity of reservoir **6** required to supply the demand shown below, if the inflow of water to the reservoir is maintained at uniform rate throughout 24 hours.

Time	00-04	04-08	8-12	12-16	16-20	20-24
Demand in million litre	0.48	0.87	1.33	1.00	0.82	0.54

8. (a) What is an equivalent pipe ? How would **6** you find equivalent size of compound pipe ?

(b) List the various layouts of water distribution **6** system and discuss any one of them.

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

(a) Air Lift Pump

(b) MPH

(c) Alum as coagulant

(d) Infilteration gallery

(e) Spigot and socket joint

(f) Ozone as disinfectant

(g) Bib Cock

(h) Eutrophication