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ET-507(A)

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

Term-End Examination

December, 2011

00072

ET-507(A) : POLLUTANTS AND WATER SUPPLY

Time : 3 hours *Maximum Marks : 70*

Note : *Answer **six** questions in all. Question No. **1** is **compulsory**. Use of calculator is **permitted**. The answer must be in your **own** language.*

1. (a) The most significant gaseous air pollutant is : **10x1=10**

(i) Carbondioxide

(ii) Oxygen

(iii) Nitrogen

(iv) Sulphur dioxide

(b) The highest contributor gas towards green house effect is :

(i) CO_2 (ii) CH_4

(iii) N_2O (iv) CFC

(c) Surface water is obtained from :

(i) well (ii) spring

(iii) artesian well (iv) rain

(d) Air values are generally provided in pressure pipes of water supply :

(i) at low points

(ii) at summits

(iii) at pipe junction

(iv) near service pipe

(e) As per IS : 1172, the consumption per head for domestic purpose under average condition is taken as :

(i) 75 lit/d (ii) 135 lit/day

(iii) 155 lit/d (iv) 235 lit/d

(f) As the multiplying factor, as applied to obtain maximum daily demand, in relation to the average daily demand is :

(i) 1.5 (ii) 1.8

(iii) 2.0 (iv) 2.7

(g) Rate of flow from a well per unit of draw down is known as its :

(i) specific yield

(ii) specific capacity

(iii) field capacity

(iv) none of these

(h) Water hammer pressure can be reduced by using :

(i) fast closing values

(ii) slow closing values

(iii) critically closing time values

(iv) none of these

(i) The standard turbidity produced by one mg of silica in one litre of distilled water is called one :

(i) JTU (ii) FTU

(iii) NTU (iv) PTU

(j) Disinfection of water helps in :

(i) removing turbidity

(ii) removing Hardness

(iii) killing pathogenic bacteria

(iv) complete sterilisation

2. (a) What is ozone layer depletion ? Discuss it's causes and impacts on global environment.

(b) Name commonly used control devices for particulates. With the help of schematic diagram, describe the functioning of fabric filters. **2x6=12**

3. (a) A 20.0 ml sample of water mixed with diluted water to fill the BOD bottle of 300 ml was found to have an initial D.O of 8.0 mg/lit; and after 5 days of incubation it's D.O was 5.0 mg/lit. Compute it's BOD_5. 6

(b) With the help of BOD curve distinguish between first stage and second stage BOD. 6

4. (a) Differentiate between Grab and Composite sampling. List the precautions used while collecting samples for laboratory examination. 6

(b) For determination of BOD a sample of source of water was tested for dissolved oxygen of original water sample. Subsequentely, the sample was diluted and dilution factor was 20. Dissolved oxygen for diluted sample and blank sample were also determined after incubation and volume of Na_2SO_4 used for three cases were 8.2 ml, 12.8 ml and 13.2 ml, respectively. Capacity of BOD bottle was 300 ml. Datermine the BOD of water sample. 6

5. (a) Population of town as obtained from census report is given below. 6

Year	1971	1981	1991	2001
Population	4,10,000	4,35,000	4,71,000	5,00,000

Estimate the population of town in the year 2011 and 2021.

(b) Define surface loading in sedimentation tank and also prove that area and overflow rate govern the design of settling tank. 6

6. With the help of neat sketch describe the working of rapid gravity filter and enumerate it's advantages over the slow sand filter. 12

7. (a) What is residual chlorine ? List the different tests to determine the amount of residual chlorine in a chlorinated water after required contact period ? Describe any one. 6

(b) The chlorine consumption in the treatment of 20,000 m^3/d of river water is 20 kg/d. The residual chlorine after 30 minutes contact is 0.45mg/*l*. Calculate the chlorine dosage in mg/*l* and the chlorine demand of river water. 6

8. (a) Using a line diagram describe the functing of Hydraulic RAM. How will you measure the efficiency of a Hydraulic RAM ? 6

(b) A water passage of rectangular cross section is to carry 13 cumec of water at velocity of 2.6 m/sec. Design the most economical section. Take Chezy's constant as 50. Also calculate the necessary slope for the channel bed. 6

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

(a) Water Borne Disease

(b) Aggressive Water

(c) Rotary Pump

(d) Dissolved Oxygen

(e) Water Meter

(f) Radial System of Water Distribution

(g) Jar Test.
