B.E. DEGREE EXAMINATIONS: NOV/DEC 2010

Fifth Semester

CIVIL ENGINEERING

U07CE506: Environmental Engineering - I

Time: Three Hours   **Maximum Marks: 100**

Answer All the Questions:-

PART A (10 x 1 = 10 Marks)

1. The design period for water supply project is taken as

   a) 5 – 10 yr   b) 10 – 15 yr   c) 50 – 60 yr   d) 20 – 30 yr

2. The aeration of water is done for the removal of

   a) Hardness   b) Turbidity   c) Colour   d) Odour

3. As compared to arthemetical increase method of forecasting population , geometric increase method gives
   a) lower value
   b) higher value
   c) same value
   d) some times higher value and sometimes lower value depending on the population figure.

4. A portable water is one which is:
    a) unpolluted
    b) unpolluted and free from disease producing bacteria
    c) unpolluted and free from disease producing bacteria and toxic substances
    d) unpolluted and free from pathogens and organic matter.

5. Which metal is toxic in drinking water even at low concentration?
    a) aluminium   b) chromium   c)copper   d)zinc

6. If hf is the head loss , Q the discharge ,l the length of pipeline, f friction factor and d the diameter of the pipe, then a relationship may be given by
   a) $hf = f \, lQ^2/12.1d^5$ b) $hf = f \, l^2Q^2/d^2$ c) $hf = f \, lQ/d$ d) $hf = f \, lQ^2/4d^2$

7. If Q in m3/s be the discharge of a pump against a head of H in m and W in kg/m3 is the unit   wt of water, then horse power of the pump given by
    a) QwH   b) QwH^2 c) QwH/75   d) $Q^2wH^2/2$

8. In the design of sedimentation tank, the essential factor to be considered
    a) surface loading   b) depth of tank   c) turbidity   d) none of these

9. In distribution pipes, air valves are provide at
    a) Lower points   b) higher points   c) junction   d) anywhere

10. In water distribution system at consumers end, the minimum residual gauge pressure should be
    a) $0.7kg/cm^2$ b)$1 \, kg/cm^2$ c)$1.4 \, kg/cm^2$ d)$5 \, kg/cm^2$

PART B (10 x 2 = 20 Marks)

11. What are the objectives of water supply scheme?
12. Write the factor used to estimate the maximum quantity of water from average supply of water?
13. What is hydrological cycle?

14. Write the analytical equation used to estimate the storage capacity of reservoir?
15. Define specific yield of well?
16. Write the permissible limit of the characteristics as per Indian standard for drinking water.
    (a) Total solids
    (b) Chloride content
17. What is a unit operation?
18. Mention the different coagulant used?
19. What are the methods of distribution system?
20. What is distribution reservoir?

PART C (5 x 14 = 80 Marks)

21. (a) How variations in demand is accounted in design of different components of water supply scheme.

(OR)

   (b) Assuming the geometric rate of growth of population of a town, calculate the population of the town in the year 2021 with the help of following census records of population.

Year	1971	1981	1991
Population in thousand	258	495	735

22. (a) Explain in detail the sub surface sources of water   **(OR)**
    (b) How will you estimate the yield of open well? Explain?

23. (a) In a water supply scheme to be designed for serving a population of 4 lakhs, the storage reservoir is situated at 8km away from the city and loss of the head from source to city is 16 meters. Calculate the size of supply main by using weisbach formula as well as using Hazens formula assuming a maximum daily demand of 200 litres per day per person and half of the daily supply to be pumped in 8 hours.
     Assume coefficient of friction for the pipe material as 0.012 in Weisbach formula. and c_H

     = 130 in Hazens formula.

(OR)

   (b) Explain the laying and testing of pipe lines.

24. (a) How will design a sedimentation tank? Write design criteria used?   **(OR)**
    (b) Design rapid sand filter for treating 10 million litres of water?

25. (a) Write in detail about the hardy cross method of analysis of complex pipe network? **(OR)**
    (b) Explain the different types of intake structures.

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