Total No. of Questions : 10]

SEAT No. :

P1693

[Total No. of Pages : 3

[5460]-510
T.E. (Civil Engg.)
ENVIRONMENTAL ENGINEERING - I
(2015 Pattern) (Semester - II)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10.*
2) *Neat diagram must be drawn wherever necessary.*
3) *Figures to the right indicate full marks.*
4) *Assume suitable data if necessary.*

Q1) a) A sample of air is analyzed at 25°c and 760 mm of Hg pressure. Find the concentration of following pollutant in ppm. **[6]**

i) SO_2=l50 µg/m^3

ii) NO_2= 85 µg/m^3

iii) CO =7.85 µg/m^3.

b) Discuss classification and effects of solid waste. **[4]**

OR

Q2) a) Why water supply scheme is necessary? Explain various phases involved in water supply scheme. **[6]**

b) Write in tabular form the titrant, indicator and colour change at the end point for determination of alkalinity, hardness and chloride in laboratory. **[4]**

Q3) a) Explain in detail fire demand with various formulae used for calculating water quantity for firefighting purpose. **[6]**

b) What do you mean by MPN? Explain in detail. **[4]**

OR

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Q4) a) Prove that theoretically, the surface loading and not the depth of water is a measure of effective removal of particles in a sedimentation tank. **[6]**

b) How is quality of water decided? Enlist important tests that are carried out in laboratory under each category. **[4]**

Q5) a) Mention the factors on which the dose of coagulant depends? Explain how the optimum coagulant dose is determined? **[8]**

b) Draw a neat sketch of under drainage system and discuss design criteria for the design of under drainage system. **[8]**

OR

Q6) a) The population of a town is one lakh and the average per capita demand is 135 lpcd. Design the coagulation cum sedimentation tank for the waterworks, supplying water to the town. The maximum demand may be taken as 1.5 times the average demand. Assume detention time 5 hours & 30 minutes for settling. Also assume that flow rate as 900 liter/hrs/m^2 of plan area. **[8]**

b) Draw a neat sketch of pressure filter and explain its working. **[8]**

Q7) a) Explain with neat sketch electro dialysis process for treatment of saline water. **[6]**

b) Water analysis shows the following results:
Free CO_2 = 3 ppm, alkalinity = 65 mg/1, non-carbonate hardness = 90 mg/1, total magnesium= 10 mg/1. Assume that it is possible to remove all but 30 mg/1 of carbonate hardness with lime and that the finished water is to have total hardness of 80 ppm. Determine the amount of chemicals required per million liter of water. **[10]**

OR

Q8) a) Write in tabular form the advantages and disadvantages of Clark process and Base Exchange process. **[8]**

b) Explain freezing and solar evaporation methods for desalination of water. **[8]**

Q9) a) What are the requirements of good distribution system? Explain any one distribution system with a neat sketch. **[9]**

b) What do you mean by rain water harvesting? Write a necessity of rain water harvesting system. Draw a sketch of 'Roof Top Rain Water Harvesting System for a bungalow. **[9]**

OR

Q10) a) What is balancing storage? Explain various methods to calculate balancing storage. **[9]**

b) The design demand of a town is four million liter per day. Water is pumped into an elevated service reservoir from 5 am to 1 pm. The supply to the town is from 5 am to 10 am and 5 pm to 10 pm at uniform rate. Design the balance capacity of the reservoir by analytical method. **[9]**

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