Total No. of Questions : 10]

SEAT No. :

P4267

[Total No. of Pages : 3

[5353]-510
T.E. (Civil Engineering)
ENVIRONMENTAL ENGINEERING - I
(2015 Pattern) (Semester - II)

Time : 2.30 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q1 or 2, Q3 or 4, Q5 or 6, Q7 or 8 and Q9 or 10.***
2) ***Neat diagram must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Find the concentration of the following in $\mu g/m^3$. Consider a sample of air is analyzed at 0°c temperature and one atmospheric pressure. **[6]**

i) CO = 10 ppm

ii) SO_2 = 0.05 ppm

iii) NO_2 = 0.4 ppm

b) Write the ambient quality standards for noise pollution. **[4]**

OR

Q2) a) Enlist the data required for the water supply scheme. Also mention various factors affecting the design period. **[6]**

b) Sate the factors which affect the generation rate of solid waste. **[4]**

Q3) a) Explain in detail domestic and public consumption of water. Give typical values in tabular form. **[6]**

b) What do you know about heavy metals? Give 04 names of heavy metals found in water. **[4]**

OR

Q4) a) Enlist various types of aerators. Draw plan and cross section for circular type cascade aerator. Also mention typical dimensions on it. **[6]**

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b) Find the dimensions of a circular sedimentation tank form the following: **[4]**

i) Detention period = 4 Hrs

ii) Quantity of water to be treated = 3 million liters per day and

iii) Depth of water = 3m.

Q5) a) Design a Flocculator for design flow of 300 m^3/hr from the following data **[10]**

i) Detention period = 20 minutes

ii) Average value of G = 40 second

iii) Speed of paddles = 4.5 rpm

iv) Area of paddles 15 % of c/s area of basin

v) Ratio of length to width of the tank = 2

vi) Depth of tank = 0.4 times of width

vii) Relative Velocity of blade = 0.75 Vp

viii) $\mu = 1.0087 \times 10^{-3}$ N s/m^2

ix) $\rho = 998$ kg/m^3

b) Differentiate between coagulation and flocculation by considering different points. **[6]**

OR

Q6) a) Explain various filter troubles. How are they rectified? **[10]**

b) A filter unit is 4.5m × 9m size. After filteringl000 m^3/day in 24 hours, the filter is run at the rate of 12 liter /second/m^2 for 10 minutes. Compute the average filtration rate, quantity and percentage of treated water required in washing and the rate of wash water flow in 04 troughs used for collecting wash water. **[6]**

Q7) a) Enlist and explain various methods of disinfection. Mention factors affecting the efficiency of disinfection. Also explain the concept of chlorine demand. **[10]**

b) What is residual chlorine? Find the dose of chlorine and chlorine demand for water of 40000 m^3/day. Chlorine used is 15 kg per day and residual chlorine after 10 minutes of contact time is 0.2 mg/l. **[6]**

OR

Q8) a) Explain with necessary chemical reactions the lime soda process for softening of water. Also compare the lime soda process with zeolite process. **[10]**

b) Explain the any two processes for removal of odour and colour. **[6]**

Q9) a) What is service reservoir? Give the importance of distribution system. Draw a near sketch of ESR and show on it all of its component parts and appurtenances. **[9]**

b) A town with a population of two lakh is to be supplied with water daily at 200 liter per head. The pumping is done from 6 am to 6 pm. The variation in demand is as follows : **[9]**

Time of the day	6 am to 9 am	9 am to 12 noon	12 noon to 3 pm	3 pm to 6 pm	6 pm to 9 pm
Demand	40%	10%	10%	15%	25%

Determine the capacity of the service reservoir by MASS CURVE METHOD.

OR

Q10) Write Note on : **[18]**

a) Methods of distribution

b) Packed WTP in township

c) Wastage and leakage of water- its detection and prevention.

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