B.E. Sixth Semester (Civil Engineering) (C.B.S.)

Environmental Engineering – II

P. Pages : 2 **KNT/KW/16/7378**

Time : Three Hours * 0 0 9 2 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Diagrams and chemical equations should be given whenever necessary.
11. Illustrate your answers whenever necessary with the help of neat sketches.
12. Use of non programmable calculator is permitted.

1. a) What are the patterns of sewage collection system? Explain with sketches. **7**

b) Design a circular combined sewer for the following data. **7**

1)	Area to be served	:	250 hectare
2)	Population density	:	1200/hectare
3)	Rate of water supply	:	135 lpcd
4)	Time of concentration	:	50 minutes
5)	Maximum velocity in sewer	:	1.6 m/s
6)	Mannings constant	:	0.012

7) Surface area has following runoff coefficient

% Surface Area	Surface	Runoff coefficient
40	Hard surface	0.85
25	Gardens & lawns	0.15
15	Unpaved street	0.3
20	Roof surface	0.8

Assume Design discharge = DWF + 2(WWF)

OR

2. a) What is 'Time of concentration'? What is its significance in determining storm water flow. **7**

b) Calculate the self cleansing velocity and gradient required to transport coarse sand though a sewer of diameter 60 cm with sand particles of diameter 1 mm and specific gravity 2.66, $\beta = 0.06$ and $f = 0.02$. Assume sewer running half full. **7**

3. a) Explain the purpose of providing a manhole. With a neat diagram explain the components of drop manhole. **6**

b) Describe various stages followed in construction of sewers. **7**

OR

4. a) With neat diagram explain street inlets. **6**

b) Write a note on ventilation of sewers. **7**

5. a) Explain why it is necessary to do characterisation of wastewater? Give a list of various physical and chemical characteristics of wastewater. **6**

b) Explain the meaning of following terms & their significance **7**
i) BOD ii) COD
iii) BOD/COD ratio

OR

6. a) A grit chamber is to be designed for a flow of 12 MLD. The chamber is designed to remove particles of 0.2 mm diameter and specific gravity 2.65. **6**

b) Draw a layout of conventional sewage treatment plant and explain function of each unit. **7**

7. a) What are the principles of biological treatment of wastewater? Explain types of biological treatment processes. **7**

b) With neat sketch explain working of activated sludge process. **7**

OR

8. a) Write a note on Sewage farming. **7**

b) Explain the various zones in a polluted stream under going self purification. **7**

9. a) A septic tank with a soak pit is to be designed for 150 persons receiving water supply of 135 lpcd. Assume desludging period of 1 year and soak well percolation rate of 1250 lit/m^3/d. **6**

b) What are the methods of disposal of septic tank effluents and explain it in brief. **7**

OR

10. a) What are the different privies used in conservancy system of sanitation. With sketch draw any one type of privy. **6**

b) Discuss application of Biological treatment for industrial wastewater treatment. **7**

11. a) Define air pollution? What are the different types of air pollutants classify them? **6**

b) Explain impact of air pollution on plants and material. **7**

OR

12. a) What are the various meteorological parameters influencing air quality. **6**

b) List the various equipments for controlling particulate matter: With neat sketch explain any one of them. **7**

****