



B.E. / B.Tech (Full-time) DEGREE END SEMESTER EXAMINATIONS – APRIL/MAY 2012

CIVIL ENGINEERING BRANCH
FIFTH SEMESTER (REGULATION: 2004)
CE 374 – ENVIRONMENTAL ENGINEERING - I

Time: 3 hours

Total Marks: 100

Instructions

- (i) Part A carries a maximum of 20 marks and Part B carries a maximum of 80 marks
- (ii) All questions in Part A carries 2 marks each and all questions in Part B carries 16 marks each
- (iii) Make suitable assumptions wherever necessary and state them clearly.

PART A (10X2 = 20 Marks)

1. Name any four sources of air pollution.
2. What are the effects of oxygen demanding waste on water bodies?
3. What is meant by design period?
4. Why coliform organisms are called indicator organisms?
5. Distinguish between BOD and COD.
6. Name any two softwares used in design of sewers.
7. Bring out the difference between self cleansing velocity and non-scouring velocity.
8. A series pipeline consists of 1400 m of 250 mm diameter pipe from point A to point B and 2200 m of 400 mm diameter pipe from point B to point C. Determine the equivalent diameter of a single 4000 m long pipeline from A to C that could theoretically replace the pipes AB and BC.
9. Name any four appurtenances used in water distribution system.
10. What is the purpose of providing trap in sanitary plumbing?

PART B (5X16 = 80 Marks)

11. What are the requirements of a good distribution system? Discuss with neat sketches the various types of layout of distribution systems.
- 12.a)i) What actions are required for sustainable development? (6)
ii) What are the factors to be considered in the selection of source for water supply scheme? (10)

(OR)

- b) The population of a town as per past census records are furnished below. Forecast the population in the year 2031 and 2041 using the following methods:
 - i) Arithmetical increase method
 - ii) Geometrical increase method
 - iii) Incremental increase method.

Census year	1941	1951	1961	1971	1981	1991	2001	2011
Population	30642	40487	52816	69859	80458	98543	111131	138586

13.a) What are intakes? Enumerate the various types of intakes. What are the important considerations which govern the selection of site of an intake?

(OR)

b)i) Explain the role of gravel packing in borewell. (6)

ii) Briefly describe the various physico-chemical characteristics of water. (10)

14.a)i) A combined circular sewer is to be laid to serve a catchment of 110 hectare. Calculate the size of the combined sewer from the following data:

Population to be served	=	40000	
Percapita water supply rate	=	110 Lpcd	
Critical intensity of rainfall	=	30 mm/h	
Coefficient of runoff	=	0.42	(10)

ii) What are the factors to be considered in the selection of pipe material for water transmission? (6)

(OR)

b)i) In a water supply scheme to be designed for serving a population of 8.5 lakhs, the storage reservoir is situated at 10.5 km away from the city and the loss of head from the source to city is 19 m. Calculate the size of the supply main by using Darcy-Weisbach formula as well as by using Hazen's formula assuming a maximum daily demand of 110 Lpcd and 2/3 of the daily supply to be pumped in 8 hours. Assume coefficient of friction (f) for the pipe material as 0.005 in Weisbach formula and $C_H = 110$ in Hazen's formula. (12)

ii) How do you compute the power requirements of a pumping unit? (4)

15.a)i) Describe with the help of sketches various types of joints used in water supply pipeline. (10)

ii) Explain the procedure for backfilling the trenches. (6)

(OR)

b)i) State briefly the basic principle governing the design of water supply in buildings with particular reference to the quantity of flow, the determination of pipe sizes and the layout of the pipe system.
