CE2304 Environmental Engineering – I

PART – A

1. Define the term potable water.
2. State the causes for water pollution.
3. Write the advantage of sub-surface sources
4. What are the uses of nomograms?
5. Define the terms 'Sedim
6. Differentiate between Te ness.
7. Draw the typical line ske
8. What is meant by equalizing reservoirs?
9. Rainwater harvesting is the need of the hour – justify.
10. List the commonly using disinfectant.
11. What are the different tests done during water analysis?
12. What do you understand by the term per capita demand? In a town or city for what purpose generally water required.
13. What major precautions are taken in handling and laying water pipe lines?
14. What are the factors be considered for locating a pumping station?
15. Sketch the layout plan of water treatment plan.
16. What are various processes required to remove the various types of impurities?
17. What are the requirements of a good distribution system?
18. Compare the merit and demerits of continuous and intermittent supply system water
19. What are the factors to be considered for rain water harvesting?
20. What are the various methods by which ground water recharge is accomplished?
21. List out any four factors affecting rate of demand
22. What are the objectives of public water supply scheme?
23. What are the intakes?
24. What are the advantages of steel pipes in water supply project?
25. What is the purpose of coagulation?
26. How can you classify filters into different categories?
27. What are the general considerations of the water distribution system design?
28. Distinguish between Gravity system of distribution and pumping system of distribution?
29. What is meant by "Ground Water Re-charge"?
30. List out the various methods of "Water Conservation" presently followed in India?
31. State the effects when each of the following substances exceeds the prescribed limits in a water sample.
    (a) Nitrates (b) fluorides
32. Define 'percapita demand'.
33. What are intakes?
34. What do you mean by 'tuberculation' in pipelines?
35. Draw the sequence of treatment you would recommend for ground water free from pollution but containing dissolved salts in large concentrations.

36. What do you mean by disinfection?

37. What are the various methods of distributing water?

38. What do you mean by 'hydraulically balanced network?

39. What do you mean by 'appurtenances?

40. Write a note on reuse of waster water.

41. Define the term "Per capita demand".

42. Give a list of different sources of water.

43. Differentiate between 'dry' and 'wet' intake.

44. What are the different materials used for water supply pipes?

45. What is meant by super chlorination?

46. List out four coagulants used in treatment of water.

47. Mention any two differences between intermittent and continuous water supply.

48. Give any two methods of leak detection in pipes.

49. Define specific yield of ground water.

50. What is reuse of waste water? Give an example.

## PART – B

11. Define the term 'per capita demand'. Write the factors affecting 'per capita demand' and state the reasons for variations in demand.

(or)

12. What are the causes for pollution of surface and subsurface sources of water? State the measures to be adopted to prevent pollution of water.

13. Draw a neat sketch of canal intake and explain the working principle. State its merit and demerits.

(or)

14. Describe the procedure adopted for laying and testing of water mains.

15. Draw a typical line sketch of water treatment plant and explain the various components in it.

(or)

16. What do you understand by the term water softening? Explain with neat sketch the zeolite process for softening of water.

17. Describe the various methods for laying the distribution lines.

(or)

18. Write a brief note leak detection and state the various tests used to detect the leakage of water.

19. Draw a neat sketch of a rain water harvesting structure and write the problems associated with operation and maintenance of rain water harvesting structures.

(or)

20. Discuss in detail the concept of linking of Indian rivers. Write the various constraints in executing this project.

21. Write in detail about "Water Pollution" in India. (4)

(b) Explain in detail about the "Reasons for the analysis of water". (4)

(c) What are the requirements of potable water for domestic use? (4)

(or)

22. (a) What are the various methods of population forecasts? (4)

(b) The census records of a city show population as follows:

| | |
|---|---|
| Present | 50,000 |
| Before one decade | 47,100 |
| Before two decades | 43,500 |
| Before three decades | 41,000 |

Workout the probable population after one, two and three decades by using Incremental increase method (8)

23. (a) What considerations govern the choice of a particular type of pump in water supply project? (6)
(b) List out the advantages of cement concrete pipes in water supply project. (6)

(or)

24. (a) What are 'Air Valves'? Explain their working in detail. (4)
(b) Explain in detail about 'Canal intakes' with a neat diagram. (8)

25. (a) Explain with a neat sketch, the working of a continuous flow type sedimentation tank. (8)
(b) Explain the principle of coagulation (4)

(or)

26. (a) List out the differences between slow sand and Rapid sand filters. (8)
(b) What is the necessity for disinfection of water? (4)

27. (a) Compare the merits and demerits of the 'Continuous' and 'intermittent' systems of water supply.
(b) Give sketches of the following:
(i) Elevated Reservoir

(ii) Surface Reservoir

(or)

28. (a) Discuss in detail about 'Radial method' of layout of distribution pipes (6)
(b) What are the points to be considered in the maintenance of distribution system of water supply?

29. (a) Explain in detail about how the 'Rain water harvesting' is useful in the conservation of water. (8)
(b) 'Waste Water is also an unused, misplaced resource' Explain. (4)

(or)

30. (a) Explain the advantages and disadvantages of 'Linking of Indian Rivers' from Economical, Environmental and Social point of views.

31. Mention the common impurities in water which should be taken into account in deciding the potability of water. sample. Describe the essential tests to be performed on such a sample.

(or)

32. The population figures of a town during the four decades ie 1960, 1970, 1980 and 1990 are 25,000, 30,500, 35,500 and 42,000 respectively. Predict its population in the year 2000 and compare the results through Arithmetical progression. Geometrical progression, Incremental increase method and changing Increase Rate method.

33. Explain the procedure for the complete testing of a newly laid C.I. pipe for carrying water supply.

(or)

34. What factors are required to be considered in the selection of the type of pump? Discuss the situations under which the following types of may be used.
(a) Reciprocating pumps
(b) centrifugal pumps
(c) Air lift pumps.

35. (a) State the principles of working of a horizontal flow sedimentation tanks.
(b) What should be the size of a rectangular sedimentation tank to treat 1.0 MLD with 2 hours detention and overflow rate less than 40,000 litres per day per sq.m. of the surface areas?

(or)

36. (a) What are the merits and demerits of the rapid sand filters as compared with slow sand filters?
(b) What is air binding? What are its effects?

37. What are the methods available for supplying water to the consumers? Which one do you think to be preferable and why?

(or)

38. What are the different methods of analyzing a given distribution system? Explain Hardz-Cross method of pipe network analysis.

39. Explain various methods of ground water recharging and state the factors to be considered.

(or)

40. What are the advantages of Rain water harvesting and discuss the various methods of rain water harvesting.

41. Discuss the various Physical, Chemical and Biological characteristics of water.

(or)

42. Name the various methods of population forecast and explain the circumstances under which it is applicable.

43. Mention any three pipe appurtenances with neat sketches.

(or)

44. What are intakes? Explain any two intake structure with neat sketches.

45. Distinguish between the slow sand filter and rapid sand gravity sand filters in a tabular form.

(or)

46. Water has to be purified for a town whose daily demand is 9 x $10^6$ litres/day. Design a suitable sedimentation tank of the water works fitted with sludge remover. Assume the velocity of flow, in the sedimentation tank as 22cm/min and the detention period as 8 hrs.

47. What are the different method of analyzing a given distribution system? Explain Hardy Cross method of pipe network analysis.

(or)

48. Write short notes on:
    (a) Service storage
    (b) Fire hydrant

49. Explain briefly about "Rain Water Harvesting".

(or)

51. Linking of Indian rivers – Discuss.
    (a) Give the permissible limits for the following in drinking water
    (i) Turbidity (ii) Chlorides
    (iii) Nitrates (iv) Hardness (v) Total Solids

(b) Enumerate the method which you can adopt for determining the total water requirement of community.

(or)

52. (a) Name five important communicable – water borne diseases what are the fundamental requirement of portable water.

(b) Describe the bacteriological rests to be performed for portable water.

53. Determine the capacity of a pump to meet the water requirement of town with the following data

(a) population of the town

(b) Difference of water level between the source and treatment plant

(c) Efficiency of the pump and it has to pump the water in 24 hours

(or)

54. (a) What are the different type of pipes in use for carrying water Indicate approximately diameters and pressure ranges in which they are used.

(b) Explain and Sketch any two types of joints used for water mains.

55. (a) What are the points to be considered for public water supply?

(b) Explain the treatment processes carried out for the removal of impurities in water?

(or)

56. (a) Discuss the relative merits of rapid sand filters and slow sand filters indicating the condition favorable for the choice each

(b) Discuss the use of chlorine as disinfecting agent with reference to a.

a) Its disinfecting action.
b) Dosage
c) Its form
d) Testing its residuals

57. (a) What are the four different systems of distribution? Explain any one system in a neat sketch.

(b) What are the different types of reservoirs used for storage purposes? Explain any one system in a neat sketch.

(or)

58. (a) Explain the hardy cross method used for pipe network analysis in water distribution system.

(b) What are the main function of the storage and distribution reservoirs?

59. (a) Explain the Nalgonda technique of deflouridation by exhibiting its use for an individual rural household.

(b) Describe the methods of effective usage of waste water.

(or)

60. (a) Discuss in detail the environmental aspects of linking of Indian rivers.

(b) Describe the procedure for removal of iron from raw supplies in rural areas.