

QUESTION BANK**PART - A****UNIT I GENERAL**

1. Write short notes on Water Resources Survey.
2. How do you calculate Average Annual Runoff depth?
3. Write short notes on Water Resources in India and Tamilnadu.
4. Define Meteorology.
5. What are the different types of Meteorological and Hydrological Data?
6. What are the steps involved in planning a Water Resources project?
7. Write short notes on National Water policy.
8. List out the softwares used for Meteorological data collection.
9. Article 246 and 262 deals with what?
10. List out the central agencies in water resources sector.
11. What are the traditional methods in Water Resources planning?
12. Write down the steps for Water Resources planning.
13. Write short notes on Roof top rain water harvesting.
14. Write down the methodologies in watershed management.
15. Write down the order of water allocation priorities in National Water policy.
16. What is the Need for National Water policy?
17. When will you revise National Water policy and State Water policy?
18. Define Ecology.
19. How Drought Prone Area will be developed?
20. Differentiate between National Water policy (1987) and National Water policy (2002)?
21. List out any 4 important river basins in India.

UNIT II NETWORK DESIGN

1. Define Hydrological cycle.
2. State the water budget equation.
3. What are the essential requirements of data?
4. List out any 4 hydrological data.
5. List out the types of precipitation.
6. What are the different forms of precipitation?
7. Differentiate b/w snow and hail.
8. What are the different types of rain gauge?
9. What are the difficulties in the measurement of precipitation?

10. How will you select the site for rain gauge?
11. What are the reasons for error in measurement of precipitation?
12. How will you calculate optimum number of rain gauge?
13. List out the methods for computation of average rainfall data.
14. Define Intensity frequency curve.
15. Draw Discharge – Area – Depth (DAD) Curves.
16. Define Double Mass curve.
17. Differentiate b/w arithmetic and Isohyetal Method.
18. What do you mean by rain gauge density?
19. Write down the advantages and disadvantages of recording type rain gauges.
20. List out the recording and non – recording type rain gauges.
21. How will you classify rainfall based on intensity?
22. What do you mean by orographic precipitation?
23. How will you measure flow in stream and rainfall?
24. List out any 4 data required for hydro meteorological studies?

UNIT III WATER RESOURCE NEEDS

1. Define water budget.
2. Differentiate b/w consumptive and non – consumptive use of water?
3. List out the factors affecting the consumptive use of water.
4. Differentiate b/w consumptive use and delta?
5. What are the different methods to measure consumptive use?
6. How will you estimate the quantity of water consumed?
7. What are the physical and chemical characteristics of water?
8. How will you integrate characteristics of water?
9. What are the factors on which water requirement for irrigation (Drinking water, Navigation) depends on?
10. Write down the contents of Master Plan?
11. What do you mean by Master Plan?
12. List out the components of Master Plan.
13. Define basin.
14. Define inflow and outflow.
15. Define Area of drainage basin.
16. What are the principles of Master Plan?
17. What is the purpose of Master Plan?
18. Define BOD.
19. What do you mean by hardness of water?
20. Define pH.
21. List any 4 equation for determination of consumptive use?

UNIT IV RESERVIOR PLANNING AND MANAGEMENT

1. Define reservoir.
2. List out the factors to be considered in selection of site for reservoir.
3. Differentiate b/w single and multipurpose reservoir.
4. What are the different types of single purpose reservoirs?
5. Differentiate b/w retarding and detention basins.
6. What are the preferable combinations for a multipurpose reservoir?
7. List out the various zones of storage in a reservoir.
8. Write short notes on reservoir sedimentation.
9. What are the different types of sediment loads?
10. Differentiate b/w suspended load and bed load?
11. List out the factors affecting sedimentation.
12. List out the control measures for sedimentation.
13. How do you fix a capacity of reservoir?
14. Differentiate b/w flow mass curve and double mass curve?
15. What do you mean by Rule curve?
16. Define design flood.
17. Define MPF.
18. What are the different methods for estimate design flood?
19. Define envelope curve.
20. List out the formula for estimating flood peak based on area.
21. What do you mean by rational method?
22. Differentiate b/w Levees and Flood walls?
23. How will channel improvement could help for flood control?
24. Define frequency analysis.
25. What do you mean by reservoir operation?

UNIT V ECONOMIC ANALYSIS

1. Define Benefit – Cost Ratio.
2. Explain Discount rate.
3. What do you mean by Discounting Factors?
4. List any 4 discounting factors.
5. What do you mean by Discounting Techniques?
6. List any 4 discounting techniques.
7. What are the techniques used in computer application for economic analysis?
8. What do you mean by Dynamic Programming?
9. Define Optimization Model.
10. Define Simulation model.
11. What are the components of a simulation model?
12. List down the steps in simulation model.

13. What are the advantages of combining optimization and simulation?
14. Differentiate b/w present worth and annual cost method?
15. Differentiate b/w rate of return and benefit cost ratio method?
16. What are the different types of single payment factors?
17. List out the factors in uniform annual series.
18. Differentiate b/w single payment and uniform annual series?
19. Differentiate b/w fixed and variable cost.
20. List out the types cost.

PART – B

UNIT I GENERAL

1. Discuss the salient feature of National Water Policy.
2. Briefly discuss about water resources in India and tamilnadu.
3. Briefly explain the steps involved in water resources planning.
4. Discuss the points about water allocation priorities in National Water Policy.
5. Define meteorology. What are the data required for meteorology? How will you collect it?
6. What is the importance of water resource survey for the development of the country?
7. Mention the importance of various data required for water resource development and how will you collect them?
8. What are the management strategies for excess and deficit water imbalance? How will you implement a water resource project?
9. Briefly discuss about Necessity of National Water Policy.
10. Briefly discuss about economics of water resource planning.

UNIT II NETWORK DESIGN

1. Briefly discuss about different types of precipitation.
2. Briefly discuss about different forms of precipitation.
3. Explain the various methods of analyzing hydrological data for water resource planning.
4. Explain – DAD, IDF, Double Mass curves.
5. What is the procedure to find the optimum number of rain gauge stations in an area?
6. Briefly discuss about different methods to find the mean rainfall in catchment area.
7. Explain in detail about the instruments used in hydrological data collection?
8. Explain any two types of recording type rain gauges?
9. Explain any two types of non - recording type rain gauges?
10. A certain catchment area has rain gauges. The mean annual rainfall recorded at these rain gauges are 1150, 1100, 950, 1000,900,800,650,500 and 600 mm respectively. The permissible error is 5%. Determine the optimum number of rain gauges.

11. The cumulative rainfall starting at 9 a.m. and stops at 11 a.m. and the data is observed at every 15 minutes. From the data, compute Maximum intensities for the various durations and plot the intensity duration curve for the storm.

Time (minutes)	0	15	30	45	60	75	90	105	120
Cumulative Rainfall mm)	0	13	20	30	45	63	83	100	116

12. Write short notes on

- i. Network Design ii. Errors in rainfall measurement

UNIT III WATER RESOURCE NEEDS

1. Briefly discuss about consumptive use of water and the factors affecting consumptive use of water. How will you measure it?
2. Briefly explain the methods for determination of consumptive use?
3. Explain the water characteristics to be investigated?
4. Explain the water requirements for irrigation, hydropower generation, navigation, drinking and disposal of sewage and industrial waste?
5. What is Master Plan in water resources? Explain the scope and aims in detail.
6. Briefly discuss about the contents of Master Plan?
7. Briefly discuss about the concept of basin as a unit for development?
8. What are the different characteristics of water? Briefly discuss about it?
9. What are the different equations for determination of consumptive use? Briefly explain it?
10. Write short notes on
 - i. Water budget equation
 - ii. Components of Master Plan

UNIT IV RESERVIOR PLANNING AND MANAGEMENT

1. Discuss the strategies for reservoir sedimentation.
2. Discuss about single and multipurpose reservoir with its advantages and disadvantages.
3. Discuss the strategies for reservoir operation.
4. Discuss about levees and flood walls?
5. How will you fix the capacity reservoir?
6. Briefly discuss about the flood control methods.
7. Differentiate between structural and non structural measures for flood control?
8. What are the factors affecting sedimentation and control measures for sedimentation?
9. Briefly discuss about the planning of multipurpose reservoir/
10. Write brief notes on channel improvement?

UNIT V ECONOMIC ANALYSIS

1. Define Benefit Cost analysis. Explain it with flow chart.
2. Briefly explain about discounting factors and its types.
3. Discuss the various discounting techniques.
4. Briefly explain about techniques used in computer application for economic analysis?
5. Differentiate between simulation and optimization model. What are the advantages of combining them?
6. What are the optimization techniques used in water resource planning? Explain any two of it.
7. A city plans to augment its water supply system. There are two project alternatives under consideration. One alternative calls for the construction of a storage dam and a treatment plant which would cost Rs. 48, 00,000 and would satisfy the estimated demand over the next 12 years. The expected annual operating cost would be Rs. 300,000. After 12 years, a second dam and additional treatment facility would be constructed with an additional operating cost of Rs. 250,000. The second alternative calls for the construction of a single large storage dam which together with a new treatment plant would cost Rs. 6200000. The annual operating cost is Rs.260,000 for the first 12 years. After 12 years additional treatment facilities would be added for Rs. 500,000 and annual operating cost would be Rs. 320,000. Examine which of the two alternatives is better for adoption. Rate of interest may be assumed uniform at 8%. (Use present worth and rate of return method)
8. The flood control project for a river basin involves evaluation of the five alternatives.
 - (a) Channel improvement alone
 - (b) Dam at site A
 - (c) Dam at site B
 - (d) Dam at site A with channel improvement
 - (e) Dam at site B with channel improvement

The investment, average annual flood damage and annual operation and maintenance charges for each of the alternative projects are listed in Table 1. The average flood damage without flood control is Rs. 35 lakhs. Assuming life of dam as 100 years, life of channel improvement as 30 years and a rate of interest of 8%, determine which of the project alternatives should be adopted as the most economical in design.

9. Write short notes on
 - i. Benefit cost ratio method
 - ii. Rate of return method
10. Write short notes on
 - i. Present worth method
 - ii. Annual cost method

Table 1.

Project	Investment in Lakhs	Average annual flood damage in Lakhs	Annual operation and maintenance In Lakhs
Channel improvement alone	30	23	6
Dam at site A	180	6	4
Dam at site B	250	4	2
Dam at site A with channel improvement	280	3	2.5
Dam at site B with channel improvement	300	2	3