

## SHORT ANSWERS

### UNIT-I

1. List the types of Falls
2. Write the functions of Canal Regulator
3. Differentiate between Super Passage & Canal Siphon
4. Differentiate between Aqueduct & Siphon Aqueduct
5. Differentiate between Level Crossing & Canal Inlet-Outlet Structures
6. Write the functions of Cross Regulator
7. Give a brief explanation about roughening devices
8. Name the components in canal fall
9. Write down any two differences between Head Regulator & Cross Regulator
10. Write the necessity and location of falls?

### UNIT-II

1. Brief about attracting Groyne
2. State the objectives of River training
3. What is the purpose of Groyne? State the factors which influence its selection
4. Classify the different types of groynes
5. List the different types of River training works
6. Define (i) Guide bank system (ii)Levees
7. Write about Aggrading type of river
8. Write about Degrading type of river
9. List out the classification of rivers
10. Define Meandering of a river
11. Write the measures to be taken to protect the river bank

### UNIT-III

1. Define dam?
2. Write few points about rock fill dam?
3. State Reservoir?
4. Give the broad classification of dams
5. List the advantages of Steel dams?
6. List the disadvantages of Steel dams?
7. List the advantages of Earth & Rock fill dams?
8. List the disadvantages of Earth & Rock fill dams?
9. List the methods to control reservoir sedimentation
10. List the classification of reservoirs
11. List the purpose of constructing storage reservoir

### UNIT-IV

1. What is a gravity dam
2. List the various forces acting on a gravity dam.
3. What is overturning failure & the factor of safety against overturning?
4. What is Sliding Failure & its factor of safety
5. List the advantages of Gravity dams?
6. List the disadvantages of Gravity dams?
7. Write few points about Earth Dam
8. Define seepage line in case of earth dams.
9. How silt pressure can be found in case of gravity dams?
10. List the causes of failures in an Earth dam

## UNIT-V

1. A turbine works with overall efficiency of 83%.The gross head and flow rate are 88m and 20m<sup>3</sup>/sec. The frictional losses in the penstock are 4m.Calculate the power developed
2. How energy is dissipated below Spillways
3. Draw a neat sketch of hydel plant and label its parts
4. Define the following terms  
(a)Load factor (b) Utilization factor (c) Capacity factor
5. Write the expression for estimating hydro power generation
6. Define the terms scroll casing in hydro power plant
7. State the objectives of Spillway
8. The hydro power plant has a turbine with the following details. Find the power developed and what is the specific speed of the turbine. Hydraulic efficiency = 90%, net head = 65 m, discharge = 15 m<sup>3</sup>/s, Speed = 100 r.p.m.
9. Write any two functions of surge tank
10. Define Morning glory Spillway and Chute Spillway

## ESSAY ANSWERS

### UNIT-I

1. Give the explanation about roughening devices? Discuss their use in construction of falls
2. Discuss what do you understand by level crossing?
3. Explain important principles of design of distributor and head regulators?
4. (a)How do you select a suitable type of cross-drainage work?  
(b) Write the important features of design of cross drainage works.
5. a) Explain Montague type fall what is the advantage over straight glacis type fall?  
b) Write about OFF-Take alignment?
6. a)How do you select a suitable type of cross-drainage work?  
b) Explain super passage
7. Explain cross drainage work admitting the drainage water into the canal
- 8.
9. Design a Sarda type fall for the following data  
Full supply discharge: $\frac{U/S}{D/S} = 40$  cumecs  
Full supply level: $\frac{U/S}{D/S} = \frac{218.30\text{ m}}{216.80\text{ m}}$  ; Full supply depth: $\frac{U/S}{D/S} = \frac{1.8\text{ m}}{1.8\text{ m}}$   
Bed width: $\frac{U/S}{D/S} = \frac{26\text{ m}}{26\text{ m}}$  ; Bed level: $\frac{U/S}{D/S} = \frac{216.50\text{ m}}{215.00\text{ m}}$ ; Drop: 1.5 m  
Design the floor on Bligh's theory taking coefficient of creep = 8 safe exit gradients may be taken as 1/5
10. State how will you determine the following in a siphon aqueduct:  
i) Contraction of canal water way. (ii) Water way for the drain

### UNIT-II

1. Describe the Types of Current meters?
2. Explain the Cup-type Current meter. How would you calibrate it?
3. Explain with sketches the (i) Denehy's groyne (ii) Bell's bund. What considerations determine the length of both?
4. What do you understand by a head regulator? State functions of a distributary head regulator and a cross-regulator
5. Discuss various types of river training and protection works
6. a) Describe the measurement of Water Depth  
a. b) Discuss the salient features of the area velocity method
7. List out the considerations while selecting the site for a stream gauging station? What are the uses of stream gauging
8. Describe in brief various types of groynes used for river training. Draw a section of a groyne
9. Write short notes on following methods for the measurement of discharge  
a. a) Tracer Method b) Slope Area Method  
b. c) Electro-Magnetic method d) Ultra Sonic method
10. Explain River Stage Measurement in detail. What is Stage Hydrograph

### UNIT-III

1. What are reservoirs? Explain the classification of reservoirs
2. Explain a)reservoir Yield b)Estimation of capacity of reservoir using mass curve
3. a) Give the necessity of storage works  
b)Explain Zoned Embankment Dam & Rock fill Dam
4. a) Explain the classification of dams based on material used for their construction  
b) Give the classification of dams according to use
5. Explain various types of dams with a neat sketch.
6. Explain various zones of storage of a reservoir.
7. What are the factors considered for the selection of a site for the construction of a dam.
8. Explain any two reservoirs in detail
9. The following information is available regarding the relationship between trap efficiency and capacity-inflow ratio for a reservoir.

Capacity/Inflow ratio	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Trap Efficiency	87	93	95	95.5	96	96.5	97	97.2	97.3	97.5

Find the probable life of the reservoir with an initial reservoir capacity of 30 million cubic meters, if the annual flood inflow is 60 million cubic meters and the average annual sediment inflow is 36,00,000 kN. Assume a specific weight of sediment equal to 12 kN/m<sup>3</sup>. The useful life of the reservoir will terminate when 80% of initial capacity is filled with sediment.

10. (a)Write a note on foundation problems for dams and their remedies  
(b)Discuss and differentiate overflow and non overflow dams.

### UNIT-IV

1. State gravity dam? Explain the various forces acting on a gravity dam.
2. Explain the methods of construction of Earth dams. Write the merits & demerits of Earth dams
3. (a) Explain elementary profile of a gravity dam  
(b) Explain the practical profile of a gravity dam.
4. Explain the various seepage control measures in Earth dams.
5. Enumerate the various modes of failure in a gravity dam
6. Explain the design criteria for Earth dams
7. Explain briefly
  - a) Leakage below dams
  - b) Seepage in Earth dams
8. Explain a) limiting height of a low gravity dam  
b) drainage and inspection galleries
9. Explain the structural failures of a gravity dam in detail
10. Explain the methods of stability analysis for gravity dams
11. (a)What is the necessity of controlling the seepage?  
(b)Also give the various devices that are used for embankment seepage control.
12. List the various forces acting on a gravity dam .Explain in detail

### UNIT-V

1. a) Define a spillway? List the various types of spillways  
b) State spillway gate? List the various types of gates.
2. Describe various types of hydel schemes .How do you assess the water potential of a hydel scheme. Enumerate principal components of a hydel scheme
3. Define a spillway? Give the design principles of Ogee spillway along with proper explanation
4. Three turbo-generators each of capacity 10000 kw have been installed at a hydel power station. During a certain period of load, the load on the plant varies from 12000 kW to 26000 kW.Calculate (i)total installed capacity (ii) Load factor (iii)Plant factor (iv)Utilization factor
5. Discuss the function of Surge tank
6. Three turbo-generators each of capacity 10000 kw have been installed at a hydel power station. During a certain period of load, the load on the plant varies from 12000 kW to 26000 kW.Calculate (i)total installed capacity (ii) Load factor (iii)Plant factor (iv)Utilization factor
7. a) Explain Ogee spillway with sketches.  
b) Explain side channel spillway with sketches

8. The following data were collected at a gauging station on a stream. Compute the discharge by  
 (a) Mid-Section method (b) The Mean Section method

Distance from one bank(m)	0	3	6	9	12	15	18	21	24	27
Water depth (m)	0	1.5	3.2	5.0	9.0	5.5	4.0	1.6	1.4	0
Mean velocity(m/sec)	0	0.12	0.24	0.25	0.26	0.24	0.23	0.16	0.14	0

9. A round crested spillway passes a design discharge of  $1 \text{ m}^3/\text{sec}$  per meter length. The coefficient of discharge may be taken as  $C_d = 0.7$ . If height of the crest above the downstream stilling basin floor level is 10 m, design the: (i) Depth. (ii) Length of the stilling basin. Depth of flow in the stream on the downstream of spillway is 1m at the design discharge of  $1 \text{ m}^3/\text{sec}$ . Enquire if the bed of the stilling basin has to be depressed
10. Explain the following components of hydroelectric scheme with the help of neat sketches: (I) Fore bay. (II) Penstocks.