

3523

3523

(4)

HFL of reservoir = 197.5 m

Width of the top dam = 4.5 m

Upstream slope = 3 : 1

Downstream slope = 2 : 1

Determine the phreatic line for this dam section & the discharge passing through the dam.

B.Tech. (Civil) 7th Semester (G-Scheme)

Examination, December-2022

DESIGN OF HYDRAULIC STRUCTURES

Paper - PCC-CE-405 G

Time allowed : 3 hours]

[Maximum marks : 75

Note: Question No. 1 is compulsory. Attempt total five questions, selecting one question from each unit.

1. Write short note on the following : $6 \times 2\frac{1}{2} = 15$

- (a) Discharge formula for Ogee Spillway
- (b) Requirements of spillway
- (c) Types of cross-drainage work
- (d) Seepage line and its importance
- (e) Canal falls
- (f) Components of guide bank

Unit - I

2. What is the importance of River training works? What are the factors on which meandering of rivers depends?

15

3523

3523-P-4-Q-9(22)

[P.T.O.]

3. (a) What is flood routing? Discuss the different methods for flood routing. $7\frac{1}{2}$

- (b) Explain the graphical method of flood routing. $7\frac{1}{2}$

Unit - II

4. (a) What are the factors which affects the selection of suitable type of cross-drainage works? $7\frac{1}{2}$

- (b) Design a syphon aqueduct with the following data: $7\frac{1}{2}$

For canal

Discharge = 55 cumecs

Bed width = 30 m

F.S. depth = 2 m

R.L. of bed = 267.00 m

For drainage

High flood discharge = 400 cumecs

HFL = 266.2 m

General bed level = 263.5 m

General ground level = 26.2 m

5. What is hydraulic design of Weir? Explain the design of the following components of Weir: 15

(i) U/S cutoff

(ii) Floor

(iii) Protection works- Make sketch where necessary.

3523

Unit - III

6. Design a 1.5 m Sarda type fall for a canal carrying a discharge of 40 cumecs with the following data : 15

(a) Bed level upstream = 105 m

(b) Bed level downstream = 102 m

(c) Side slopes of channel = 1:1

(d) F.S.L upstream = 106.8 m

(e) F.S.L downstream = 103.3 m

(f) Berm level upstream = 107.5 m

(g) Bed width u/s and d/s = 30 m

(h) Safe Exit gradient for Khosla's theory = $1/5$

7. Which are the main types of spillways? Briefly discuss about each spillway with neat sketches where required. 15

Unit - IV

8. Which forces are considered on gravity dam? Discuss different modes of failure in gravity dam. 15

9. An earthen dam made of a homogeneous material have the following data: 15

Coefficient of permeability = 5×10^{-4} cm/sec of dam material

Level of top of dam = 200 m

Level of deepest river bed = 178 m

3523

P.T.O.