

C 30072

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Name

Reg. No.



**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2014 SCHEME]
EXAMINATION, NOVEMBER 2017**

Civil Engineering

CE 14 702—DESIGN OF HYDRAULIC STRUCTURES

Time : Three Hours

Maximum : 100 Marks

Part A

Answer any four questions.

Each question carries 5 marks.

1. How will you select the suitable site for a gravity dam ?
2. Distinguish between modular and non-modular outlets.
3. Explain the causes for failure of the weirs founded on permeable soils.
4. Discuss the design criteria of Bligh's creep theory.
5. State the necessities of cross drainage works.

(4 × 5 = 20 marks)

Part B

Answer any one full question.

Draw sketches wherever necessary.

The question carries 15 marks.

6. (a) Explain the design procedure of an arch dam by thin cylinder theory. **(7 marks)**
- (b) Describe the different types of spillways used in dams. **(8 marks)**

Or

7. (a) Design the practical profile of a gravity dam of stone masonry for the following data :

Ground level R.L. = 1130.50 m., R.L. of H.F.L. = 1155.50 m.,

Wave height = 1.0 m., Specific gravity of masonry = 2.50,

Permissible compressive stress for stone masonry = 125 ton/m.²

*Assume suitable data wherever necessary.

(10 marks)

- (b) Discuss the main functions of galleries in dams.

(5 marks)

[1 × 15 = 15 marks]

Turn over

Part C

Answer any one full question.

The question carries 65 marks.

8. A tank surplus has the following data :

Combined catchment : 36 sq.km., Intercepted catchment : 22 sq.km., F.T.L. = + 17.00 m., M.W.L. = + 17.75 m., Crest level of weir = + 17.00 m., Ground level at site = +16.00 m., T.B.L. = + 18.75 m., $C = 10$, $c = 2.5$ in Ryve's formula, Hard soil for foundation = + 14.50 m., Top width of bank = 3 m., Tank bund slopes : u/s = 1.5 : 1 and d/s = 2 : 1.

Assume suitable data found to be necessary.

Design the length of surplus weir, abutments, wing walls and return walls.

Draw the following with suitable scale :

- (i) Half plan at foundations and half plan at top clearly showing the bank connections.
- (ii) Draw a section across the body wall showing aprons, etc.

Or

9. A notch type of canal fall has the following data :—

<i>Hydraulic particulars</i>	<i>U/S of drop</i>	<i>D/S of drop</i>
Full supply discharge ...	4 m ³ /sec.	4 m ³ /sec.
Bed width ...	6 m.	6 m.
Bed level ...	+ 10.00 m.	+ 8.00 m.
Full supply depth ...	1.5 m.	1.5 m.
F.S.L. ...	+ 11.50 m.	+ 9.50 m.
Top of bank 2 m. wide ...	at level + 12.50 m.	at level + 10.50 m.

Half supply depth 1 m., ground level at site of work is + 10.50, Good soil for foundation is available at + 8.50 m. Design the drop wall, cistern and notches.

Draw the following with suitable scale :

- (i) Draw a half plan at foundations and half plan at top of fall.
- (ii) Draw a cross-section across the body wall, cistern and aprons.

(1 × 65 = 65 marks)