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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

Seventh Semester

Branch : Civil Engineering

CE 010 701—DESIGN OF HYDRAULIC STRUCTURES (CE)

(New Scheme—2010 Admission onwards—Regular/Supplementary)



Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. What is a spillway ? What are its functions ?
2. What is meant by economic buttress spacing and best central angle of an arch dam ?
3. Differentiate between weir and barrage.
4. Write a note on notch type fall.
5. List out the different types of hydel plants and briefly describe the storage plant.

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Explain practical profile of a gravity dam.
7. Define and explain phreatic line in earthen dam.
8. Describe with the help of sketch, the working of a silt excluder.
9. What is meant by canal falls ? Where are they located ?
10. Define and differentiate between Load factor, Utilization factor and Capacity factor.

(5 × 5 = 25 marks)

Part C

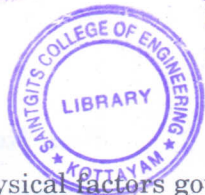
Answer all questions.

Each full question carries 12 marks.

11. Enumerate the classification of dams. Discuss in brief merits and demerits of various types of dam.

Or

Turn over



12. (a) Explain physical factors governing selection of type of a dam. (5 marks)
(b) Explain elementary profile of a gravity dam. Derive an expression for determining base width of such a dam based on stress criterion and sliding criterion. (7 marks)

13. Enumerate the design methods used in the design of arch dams. Explain thin cylinder theory in detail.

Or

14. (a) What are earthen dams and under what circumstances are they preferred? (5 marks)
(b) What are the causes of failure of earth dam? (7 marks)
15. Explain with help of a diagram, the various component parts along with their functions of a diversion head work.

Or

16. Discuss the main causes of failure of weirs founded on previous foundations. Briefly explain the salient features of Khosla's theory and how it is used in the design of permeable foundations.
17. Design a 1 m. sarda type fall for a canal carrying a discharge of 15 cumecs with the following data :

Bed level (up stream) — + 99.20
Bed level (down stream) — + 98.20
Side slopes of channel — 1 : 1
Full supply level upstream — + 101
Bed width (upstream and down stream) — 10 m.
Soil — Good loam
Bligh's coefficient — 10.

Or

18. Design the salient dimensions of a syphon well deep for the following particulars :—

Fall — 4 m.
General ground level — + 99.
Full supply depth 0.8 m.
Bed level (upstream) — + 99.2
Discharge — 0.5 m.³/s
Bed width (upstream and down stream) — 2.7 m.

19. (a) Describe with the help of sketches various types of cross drainage works. (8 marks)
(b) What are cross drainage works? What is the necessity of such a work in a canal project? (4 marks)

Or

20. What are the principal components of a hydroelectric scheme? Discuss the utility of each component. [5 × 12 = 60 marks]