CBCS SCHEME

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15CV832

Eighth Semester B.E. Degree Examination, Aug./Sept.2020
Hydraulic Structures

Time: 3 hrs. Max. Marks: 80

Note: i) For Regular Students: Answer any FIVE full questions irrespective of modules.
ii) For Arrear Students : Answer any FIVE full questions, choosing ONE full question from each module.
iii) Missing data may be suitably assumed.

Module-1

1 a. Explain with a neat sketch, different forces acting on a gravity dam. **(08 Marks)**

b. Show that $B = \frac{H}{\sqrt{S_C - C}}$ with usual notations considering the elementary profile of a gravity dam. **(08 Marks)**

2 a. What are the modes of failure of gravity dam? Explain. **(08 Marks)**

b. Explain with neat sketches, the functions of drainage gallery. **(08 Marks)**

Module-2

3 a. Explain different causes of failures of earthdams. **(08 Marks)**

b. How Seepage discharge is computed in (i) Isotropic soils (ii) Anisotropic soils. **(08 Marks)**

4 a. An earthendam made of a homogenous material has the following data:
Coefficient of permeability of dam material = 5×10^{-4} cm/sec
Level of top of dam = 200.0 m
Level of deepest river bed = 178.0 m
HFL of reservoir = 197.5 m
Width of top of dam = 4.5 m
Upstream slope = 3:1
Downstream slope =2:1
Draw the seepage line and determine quantity of seepage passing through the dam if a horizontal filter of length equal to 25 m is provided inward from the downstream toe of the dam. **(08 Marks)**

b. Explain with neat sketches types of Earthdams. **(08 Marks)**

Module-3

5 a. How do you design the apron using Khosla's theory? Explain with sketches. **(08 Marks)**

b. What is spillway? Mention different types of spillway. Explain Ogee spillway. **(08 Marks)**

6 a. How do you design the apron using Bligh's theory? Explain. **(08 Marks)**

b. How Energy dissipation is carried out below spillways? **(08 Marks)**

Module-4

7 a. What are different types of cross drainage works? Explain with neat sketches. **(08 Marks)**

b. How do you select a suitable type of cross drainage work? **(08 Marks)**

8 Design:
a. Drainage waterway
b. Canal waterway
c. Transitions
d. Trough for the following data at the crossing of a canal and a drainage :
Canal: Full supply discharge = 32 cumecs
Full supply level = RL 213.5
Canal bed level = RL 212.0 m
Canal bed width = 20
Trapezoidal canal section with 1½ H : 1V slopes
Drainage: High flood discharge = 300 cumecs
High flood level = 210 m
High flood depth = 2.5 m
General ground level = 212.5 m **(16 Marks)**

Module-5

9 a. What are canal outlets? Explain any two canal outlets with figure. **(08 Marks)**
b. What is the necessity of canal falls? Explain any two types of canal falls with neat sketches. **(08 Marks)**

10 a. What are the functions of head regulator and cross regulators? Explain with sketches. **(08 Marks)**
b. Explain with sketches:
(i) Trapezoidal notch fall
(ii) Alignment of the off-taking channel **(08 Marks)**

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