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Roll No .....

CE-6001 (CBGS)

B.E. VI Semester

Examination, May 2019

Choice Based Grading System (CBGS)

Design of Hydraulic Structures

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions. All questions carry equal marks.
ii) Assume suitable data if missing/required and mention it clearly.

1. a) Explain in details the various forces causing instability in a gravity dam. 7
   b) What is meant by the term "low dam"? Determine the dimensions of an elementary profile of a low gravity dam. 7

2. Explain with neat sketches the different types of rock fill dams. List out the merits and demerits of rock fill dams. What factors that must be considered when specifying rock fill type of dam for a particular project? 14

3. Design an ogee spillway for concrete gravity dam for the following data: 14
   D/S face slope of gravity dam = 0.7 H : 1V
   Design discharge of spillway = 8000 cumecs
   RL of spillway crest = 100 m
   Length of spillway = 6 span with a clear width of 10 m each
   Thickness of each pier = 2m

4. Enumerate the various types of energy dissipation that are used for energy dissipation below overflow spillway under different relative position of TWC and JHC. 14

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5. Design a suitable head regulator for the barrage. The following data for the off taking canal are given 14

Full supply discharge of canal	= 180 cumecs
Anticipated max full supply level of canal	= 260.2 m
Bed level of canal	= 257.2 m
The crest level of the under sluices	= 257 m
Pond level	= 260.6 m
U/S HFL	= 263.2 m
Velocity head at U/S	= 0.19 m
Safe exit gradient for canal bed material	= 1/5

6. Design a suitable cross drainage work, given the following data at the crossing of a canal and a drainage. 14

CANAL	
Full supply discharge	= 32 cumecs
Full supply level	= 213.5 m
Canal bed level	= 212 m
Trapezoidal canal section with 1.5 H : 1 V slopes	
Canal water depth	= 1.5 m
DRAINAGE	
High flood discharge	= 300 cumecs
High flood level	= 210 m
High flood depth	= 2.5 m
General ground level	= 212.5 m

7. a) Define the terms : Capacity factor, Load factor, Power factor and utilisation factor. 7
   b) Explain briefly various classifications of Hydro electric plants. http://www.rgpvonline.com 7

8. a) Write short notes on pumped storage plants and tidal plants. 7
   b) Explain with a neat sketch the components of hydro power plant. 7

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