

B.Tech. Civil (Water Resources Engineering)

Term-End Examination

December, 2015

ET-536(A) : HYDRAULIC STRUCTURES – I

Time : 3 hours

Maximum Marks : 70

Note : *Attempt any five questions. Each question carries equal marks. Use of non-programmable calculators only is allowed.*

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1. (a) What are the various types of reservoirs ?
What do you understand by a conservation
and a flood control project ? 7
 - (b) What are the various factors to be
considered in the selection of a dam site and
type of a suitable dam ? 7
 2. (a) How is the water pressure accounted for in
the non-overflow and spillway portion of the
dam ? Write a short note on drainage
galleries provided in the gravity dam. 7
 - (b) Enumerate the gravity method of stability
analysis of gravity dams underlying the
important assumptions involved. 7

3. (a) What are the various types of earth dams ? Discuss the various types of failures in earth dams. 7
- (b) What do you understand by 'full reservoir capacity' ? What is meant by reservoir operation ? 7
4. (a) What are headworks ? Describe the two types of canal headworks. What are the various stages of rivers where headworks may or may not be located ? 7
- (b) What are the functions of canal head regulators ? How are the crest levels of canal head regulators fixed ? 7
5. (a) Explain the Bligh's theory for the design of impervious weir floors on permeable foundations for sub-surface flow. What are the limitations of Bligh's theory ? 7
- (b) What is the speciality of the crest of side channel spillway ? Describe in brief the advantages and disadvantages of syphon spillways. 7
6. (a) What are the different types of stilling basins ? Describe the purposes served by spillway gates. 7
- (b) Why are seepage and leakage control important in embankment dams ? List the various types of drainage facilities provided in earth dams, and describe any two of them with suitable sketches. 7

7. Write short notes on the following :

$$4 \times 3 \frac{1}{2} = 14$$

- (a) Sediment load and its determination
 - (b) Location of phreatic line in earth dams
 - (c) Khosla's curves
 - (d) Current meter
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