

B.Tech. Civil (Construction Management)

Term-End Examination

December, 2015

00901

ET-535(B) : HYDRAULIC STRUCTURES

Time : 3 hours

Maximum Marks : 70

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

1. (a) What are the uses of mass curves ? How is the capacity curve of a reservoir prepared ? 7
- (b) What is an arbitrary section of a gravity dam ? How would you design one such section ? Explain the low and high gravity dams. 7

2. (a) On what considerations will you select the top width of an earth dam ? How do you define free board for an earth dam ? 7
- (b) What are the various components of a diversion headwork ? Present a typical layout of canal headworks including river training works. Enumerate the different stages of any Himalayan river. 7

3. (a) What are the functions of scouring sluices ?
How do you fix the discharge capacity of
under-sluices ? 7
- (b) What aspects of floor on permeable
foundations can be assessed by Khosla's
curve ? What do you understand by
exit gradient and safe exit gradient ? 7
4. (a) What are the various losses encountered
during supply of water through a canal in
an earthen section ? How do you account
them for design procedure ? 7
- (b) Design an irrigation channel to supply
50 cumecs of water by Lacey's method,
assuming silt factor 1.0. 7
5. (a) Design a concrete lined (trowel finished)
canal section for the following data : 7
- Discharge = 30 cumecs
- Bed slope = 1 in 6000
- Side slope of the channel = 1.25 H : 1 V
- Manning's $n = 0.012$.
- (b) What do you mean by a canal outlet ? Give
the classification of outlets. What are the
requirements of a good outlet ? 7

6. (a) Discuss the factors that influence the choice of an open aqueduct. What is the importance of cost factor while choosing an alternative out of these types ? 7
- (b) What is the purpose of control structures ? Give some actual field examples with suitable sketches. 7
7. (a) List the various types of falls commonly adopted on canals. Enumerate the salient design parameters of a fall. 7
- (b) What are the design criteria for distributary head regulators ? Explain the factors that govern the design criteria for cross-regulators. Give reasons for each criteria. 7
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