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ET-535(B)

B.Tech. Civil (Construction Management)

Term-End Examination

00520

June, 2016

ET-535(B) : HYDRAULIC STRUCTURES

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any* ***five*** *questions. All questions carry equal marks. Use of scientific calculator is allowed.*

1. (a) What are reservoirs ? State their classification and their purpose. 7

(b) What are the empirical relations for estimating the sedimentation rates of Indian rivers ? 7

2. (a) Explain gravity dam with its design requirements. 7

(b) State the role of construction joints in a gravity dam and give its classification. 7

3. (a) Describe the various types of failures of earth dam with labelled diagrams. 7

(b) What are the various stages of river where head-works may or may not be located ? Also list out the advantages of head-works in the boulder and trough stages. 7

4. Design a 1·3 m Sarda fall for a channel conveying 20 cumecs of discharge at a depth of flow equal to 1·5 m. The bed width of the canal is 1·8 m. 14

5. (a) Describe Lacey's silt theory with its Regime equation with a neat diagram. 9

(b) Design an irrigation channel to supply 50 cumecs of water by Lacey's method, assuming a silt factor of 1·0. 5

6. (a) Explain about Fish Ladder with a labelled diagram. 7

(b) What are the functions of canal head regulators and how are the crest levels of canal head regulators fixed ? 7

7. (a) What is the classification of outlets ? Explain all the modular outlets. *9*

(b) A discharge of 0·03 cumec is desired to pass through a pipe outlet (i.e., a non-modular arrangement). Given that the available working head for it is 6 cm. Design the outlet for the following considerations : *5*

(F.S.L. of the distributary = 100 m)

(i) Coefficient of discharge = 0·50

(ii) (1) Length of the outlet pipe = 15·5 m

(2) Friction factor for the pipe = 0·1

8. Write short notes on the following : $4 \times 3\frac{1}{2} = 14$

(a) Causes of failure of Gravity Dam

(b) Concrete lining and Brick lining

(c) Transmission of losses of canals

(d) Trap Efficiencies
