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No. of Printed Pages : 3

ET-536(B)

**B. TECH. CIVIL (WATER RESOURCES
ENGINEERING) (BTWRE)**

Term-End Examination

June, 2019

ET-536(B) : HYDRAULIC STRUCTURES—II

Time : 3 Hours

Maximum Marks : 70

*Note : Attempt any five questions. All questions
carry equal marks.*

1. (a) Why inundation canals are cost effective ?
Discuss. 7
- (b) Draw the typical cross-section of a canal in
cutting. 7
2. (a) Explain the necessity of cross drainage
works. Why do they cross the natural
drainage at different levels ? 7
- (b) Define flexibility of an outlet. Show that : 7

$$\text{flexibility (F)} = \frac{m}{n} \times \frac{h}{H},$$

where all the terms have their usual
meaning.

3. (a) Using Lacey's basic regime equations, show that : 7

$$V = \left(\frac{Qf^2}{140} \right)^{\frac{1}{6}}$$

- (b) Explain design procedure of channel by Kennedy's theory when Q , N , m and S are given. 7
4. (a) Describe the important characteristics of material lining for irrigation channels. 7
- (b) How does a well help in raising the water level or pond level ? 7
5. (a) What do you mean by scouring sluices ? Explain their functions. 7
- (b) Define uplift pressure. How can you provide safety against uplift pressure as per Bligh creep theory ? 7
6. (a) Discuss in brief the requirements of a good outlet. 7
- (b) Discuss the river training measures required for guiding the flow near hydraulic structures. 7
7. Write short notes on the following : $4 \times 3 \frac{1}{2}$
- (a) Capacity of a canal

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- (b) Bank protection
 - (c) Cost of lining
 - (d) Silt control at off-take
8. Differentiate between the following : $4 \times 3 \frac{1}{2} = 14$
- (a) Alluvial and Non-alluvial canals
 - (b) Initial and Final Regime
 - (c) Superpassage and Aqueduct
 - (d) Modular and Non-modular Outlets