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ET-536(B)

B.Tech. Civil (Water Resources Engineering)

01850

Term-End Examination

December, 2010

ET-536(B) : HYDRAULIC STRUCTURES-II

Time : 3 hours *Maximum Marks : 70*

Note : *Answer **any five** questions. All questions carry **equal** marks. Use of calculator is permitted.*

1. (a) Discuss the importance of control structures on a perennial irrigation system. 7

   (b) Explain the necessity of cross- drainage works. Why do canals cross the natural drainage at different levels ? 7

2. (a) Use Lacey's basic regime equations, show that $R = 0.47 \left(\frac{Q}{f}\right)^{\frac{1}{3}}$ Where Q = discharge and f = silt factor 7

   (b) Write down the design steps of a channel section using Kennedy's theory for given 7

   (i) discharge
   (ii) N
   (iii) critical velocity ratio, m
   (iv) side slope, and
   (v) bed slope, S

3. (a) What do you understand by scour in a loose boundary canal ? 7

(b) What do you understand by balanced earth work in the construction of a canal ? 7

Bring out the importance of longitudinal slope, and alignment in this respect.

4. (a) What do you mean by sensitivity of an outlet ? 7

Show that sensitivity, S can be expressed as

$$S = \frac{mh}{H}$$

(b) How do you select the type of a module for an outlet ? 7

Discuss in brief with reference to relevant factors.

5. (a) Explain the various steps which are followed in the design of guide banks with reference to a bridge. 7

(b) Describe the design criteria for distributory head regulator. Give justification for each criteria. 7

6. (a) Describe the different types of cistern used for energy dissipation. Also discuss in detail the most efficient type of it. 7

(b) Describe the particular river training measures required for navigation purposes. 7

7. Differentiate between the following : 4x3½=14

(a) Super passage and Aqueduct

(b) Final and permanent regime

(c) Distributory and Canal Head Regulator

(d) Alluvial and Non-Alluvial canals

8. Write short notes on the following : 4x3½=14

(a) Capacity of a canal

(b) Bank Protection

(c) Level crossing

(d) Design of Lined canal