No. of Printed Pages : 3

ET-536(B)

00321

B.Tech. CIVIL (WATER RESOURCES ENGINEERING)

Term-End Examination

December, 2013

ET-536(B) : HYDRAULIC STRUCTURES-II

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **any seven** questions. Each question carries **equal** marks. Use of scientific calculator is **permitted**. Assume **any** missing data suitably.*

1. (a) Differentiate between alluvial and non-alluvial canals. What do you understand by the terms permanent and inuadation canals ? 5

   (b) What are the various losses encountered during transmission of water through a canal in an earthen section, and how they are accounted for in design procedure? 5

2. (a) What do you understand by contour canals, water-shed canals and side-slope canals ? show with suitable sketches. 5

   (b) Enumerate the practical reasons for providing curves on canals. What alternative provisions you can suggest for a sharp curve ? 5

3. (a) Why are cross-drainage works needed ? Why do they cross the natural drainage at different lavels ? Distinguish between aqueduct and syphon aqueduct. 5

(b) What are the various design parameters for cross-drainage works ? Discuss the individual influence of each parameter. 5

4. Design a trapezoidal channel(2 H : IV) to convey 30 cumecs of clear water with a bed slope of 1/6000. The canal bed and banks consists of coarse sand of 3 mm size(angle of repose = 31°). Adopt the tractive force approach. 10

5. (a) What are the various materials used for linning a channel ? Describe relative merits and demerits of any two materials. 4

(b) Design a concrete lined channel having a trapezoidal section for the following data: 6
Discharge = 30 cumec
Bed slope = 1 in 9000
Side slopes of channel = 1.25 : 1(H : V)
Depth of channel is restricted to 4 m.
Adopt manning's $\eta = 0.012$.

6. (a) An adjustable orific semi-module is to be fitted in a distributary, for the following conditions 5
Discharge of the out let = 0.30 cumec.
Working Head = 0.65m
F .S. L. of the distributary = 101.60m
Bed Level of the distributary = 100.00m
design the module.

(b) How do you select the type of a module for an outlet ? What are the requirements of a good outlet ? 5

7. (a) Discuss various measures to control and remove silt from a water course. 5

(b) Why do we need roughening devices down-stream of a canal fall ? What locations are suitable to provide them ? 5

8. Design a 1.4 m Sarda Fall for a channel conveying 24 cumec of discharge at a 1 - 2 m depth of flow. The bed width of the canal is 24m 10

9. (a) Distinguish between a head regulator and a cross-regulator. 5

(b) What are the objectives of river training works ? What are the various methods of river training works ? 5

10. (a) What is meant by high-water training ? Discuss the over all scheme with reference to a practical situation. 5

(b) What are the criterion for determing channel dimensions for navigation ? Explain how these have been applied in any Indian field situation. 5