No. of Printed Pages : 4

ET-536(B)

00954

B.Tech. CIVIL (WATER RESOURCES ENGINEERING)

Term-End Examination

June, 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) What do you understand by the terms permanent and inundation canals ? How inundation canals are cost-effective ? 5

(b) How can an irrigation canal be utilised to develop hydro-electric power ? What are the requisite features of the area that must exist for this purpose ? 5

2. (a) What do you understand by contour canals, water shed canals and side slope canals" ? 5

(b) Write short notes on ***any two*** of the following : **2x2½=5**

(i) Berm Width

(ii) Free-Board

(iii) Top width

3. (a) Discuss the factors influencing the choice of an open aqueduct. How do syphon aqueducts differ from ordinary aqueducts? 5

(b) What are the considerations for selecting a suitable type of cross - drainage works ? Discuss with reference to a given site. 5

4. (a) Bring out the limitations of Kennedy's and Lacey's silt theories; and explain their implications. 4

(b) Design an irrigation channel to supply 30 cumec of water at a slope of $\frac{1}{6000}$ With Kutter's N = 0.0225 and m = 0.95 using Kennedy's theory. 6

5. Design a concrete lined channel having a trapezoidal section for the following data : 10

Discharge = 30 cumec

Bed slope = 1 in 9000

Side slope of channel = 1.25 : 1 (H : V)

Depth of channel restricted to 4m

Adopt Manning's n = 0.012

6. (a) What are the sluices and where are they provided ? 4

(b) A water course is to take a flow of 0.04 cumec. Design an open flume out let from the concerned distributary if the full supply depth in the distributary = 0.70m. 6

7. (a) What are the objectives of a distribution system ? What do you understand by control of a distribution system ? 4

(b) Write a detailed description and working of the block system of water distribution ? 6

8. (a) Why is a cistern element needed and where is it located on a canal fall ? 4

(b) Given H = 1m, d = 10cm , f = 0.012 L = 3m, Determine the discharging capacity of the pipe drop spillway. 6

9. (a) Describe the design criteria for cross regulators giving the reasons. Distinguish between a head regulator and a cross-regulator. 5

(b) Discuss the methods available for controlling entry of silt into a canal. What causes distributary channels to draw excessive silt ? 5

10. (a) What particular river training measures are required for the following ? Explain any two with examples. $2x2\frac{1}{2}=5$

(i) guiding the flow near hydraulic structures

(ii) sediment control

(iii) Stabilisation of a river channel

(b) What are the criteria for determining channel dimentions for navigation ? Explain how these have been applied in any field situation. 5