Irrigation Engineering

Con/5418–07. (OLD COURSE) CD–6813

(3 Hours) [Total Marks : 100

MASTER

N.B. : (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) Assume any **suitable** data wherever **necessary**.

1. (a) The ordinates of a 4–h unit hydrograph at an interval of 4 hr. are 0, 20, 80, 130, 150, 130, 90, 52, 27, 15, 5 and 0 cumecs. Derive the ordinates of 2–hr UH for the same catchment. 10
(b) List the forces acting on a gravity dam, outline the procedure to determine the moments. 10

2. (a) (i) Explain the causes of failure of earthen dams. 5
(ii) Discuss – seepage control in earthen dams. 5
(b) Design a regime channel for a discharge of 40 cumecs and silt factor 1·1, using Lacey's Theory. 10

3. (a) Explain in detail any two types of cross-drainage works with their sketches. 10
(b) Describe the methods of Irrigation. 10

4. (a) Derive the equation for a steady state discharge from a well completely penetrating a confined aquifer. 10
(b) Explain with neat sketch the methods adopted for Base flow separation. 10

5. (a) A gravity dam is 60 m high, has a top width of 7 m and free board of 3 m. Neglecting tailwater and assuming suitable slopes upstream and downstream check the stability for reservoir full condition. 12
Density of concrete = 24 KN/m3
Uplift coefficient = 0·8
Coefficient of friction = 0·7.
(b) Explain the step by step procedure of designing a Chute spillway. 8

6. (a) Write short note on waterlogging. What are the causes and control measures of water logging ? 10
(b) Explain in detail the solid roller, ski-jump and stilling basin type of energy dissipators. 10

7. Write short notes on : 20
(a) Arch and butress dam
(b) Modular and non-modular outlets
(c) Reservoir sedimentation
(d) Distributory head regulator and cross regulator.

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