MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : CE(PC)603 Water Resources Engineering

UPID : 006733

Time Allotted : 3 Hours *Full Marks :70*

The Figures in the margin indicate full marks.
Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer *any ten* of the following : [1 x 10 = 10]

(I) Lacey's theory is applicable to which flow?

(II) Seepage losses in canal are more when it is
a. completely in filling; b. fully in cutting; c. Partly in filling and partly in cutting

(III) Explain capillary fringe .

(IV) Write chezy's formula.

(V) Alkali soils are reclaimed by which process?

(VI) What is consumptive use ?

(VII) Gibbs module is an example for ---------- outlet.

(VIII) What are the principal causes and effects of water logging in canal irrigated farm?

(IX) What is vadose water?

(X) Specific energy through a circular channel takes place when depth of flow is equal to

(XI) The best method of applying irrigation water to study undulating area is _____.

(XII) What is the use of lysimeter ?

Group-B (Short Answer Type Question)

Answer *any three* of the following : [5 x 3 = 15]

2. Define the term most economical section of a channel. What are the condition for the rectangular channel of the best action . [5]
3. What are the advantages and ill effects of assured irrigation ? [5]
4. Enumerate the different terms by which duty can be improved. [5]
5. What are the possible causes of water losses in a canal? What are the methods adopted for reducing such losses? [5]
6. How will you proceed to reclaim saline land ? [5]

Group-C (Long Answer Type Question)

Answer *any three* of the following : [15 x 3 = 45]

7. (a) State the difference between Initial regime and Final regime. [5]
   (b) Design an irrigation channel section for the following data: Discharge = 30 cumecs, Silt factor = 1.0, Side slopes = 1/2:1. Draw the complete channel cross section assuming it to be in part cutting and part filling . [10]
8. A tile drainage system draining 15 hecters, flows at a design capacity for three days, following a storm. If the system is desgined using a drainage coefficient of 2.25 cm how much water will be removed during this period? [15]
9. A 30 cm dia. well penetrates 20 m below the static water table. After 24 hours of pumping at 5000 liters per minute, the water level in a test at 100 m away is lowered by 0.5 m, and in a well at 30 m away, the drawdown is 1 m . What is the transmissibility of the aquifer? [15]
10. (a) Find the rate flow of water through V shaped channel having total angle between the sides as 60 degree. Take the value of C = 50 and the slope of the bed 1 in 1500. The depth of flow is 6 m. [8]
    (b) The rate of flow of water through a circular channel of diameter 0.8 m is 2000 li tter /s. Find the slope of the bed of the channel for maximum velocity . Take C = 50 [7]
11. A sluice gate discharges water into a horzontal rectangular channel with a velocity of 8 m/s and depth of flow is 0.5 m. The width of the channel is 6m. Dteremine whether a hydrulic jump will occur , and if so find its height and loss of energy per kg of water . also determine the horse power lost in the hydraulic jump. [15]