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Total No. of Questions : 09] [Total No. of Pages :02

Paper ID [CE306]

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B.Tech. (Sem. - 6th)

IRRIGATION ENGINEERING - I (CE - 306)

Time : 03 Hours **Maximum Marks : 60**

Instruction to Candidates:

1) Section - A is **Compulsory**.
2) Attempt any **Four** questions from Section - B.
3) Attempt any **Two** questions from Section - C.

Section - A

Q1) *(10 × 2 = 20)*

a) What are the ill effects of irrigation. Explain the following terms:-

b) Consumptive use of water and permanent wilting point.

c) Capacity factor and time factor.

d) Water shed canal and contour canal.

e) Gross commanded area and culturable commanded area.

f) Guide bank and spur.

g) Multi purpose project and its utility.

h) Strainer type and cavity type tube wells.

i) Coefficients of permeability and transmissibility.

j) Surface and sub - surface drains.

Section - B

(4 × 5 = 20)

Q2) Derive a relationship between the duty and delta for a given base period.

Q3) Compare Kennedy's and Laccy theories for the design of irrigation channel in alluvial soil.

Q4) Design a lined channel to carry a discharge of 50cumecs. Assume bed slope as 1 in 8100, N as 0.015 and side slope as 45°.

Q5) Design an open drain for 600 ha of land having a drainage coefficient of 2.2cm per day. The soil is silt loam with N = 0.04. The maximum permissible bed slope is 1 in 1000 use Manning's formula. The side slopes are 1.5:1, Assume a depth of 1.2m.

Q6) What are the important consideration made while planning of an irrigation project.

Section - C

(2 × 10 = 20)

Q7) Describe briefly the objectives of river training works. Also enumerate different types of river training works.

Q8) Derive the formula for obtaining safe yield from a confined aquifer by Dupuit's theory. A fully penetrating well of diameter 0.4m is drilled in a confined aquifer 2.5m thick. If the steady state drawdowns at 10m and 50m are observed to be 2.50m and 0.5m, determine the discharge Take $K = 1 \times 10^{-3}$ m/sec

Q9) What are the various types of water losses which occur in an irrigation canal. Suggest suitable methods for reducing the losses. Determine the design outlet discharge from the average demand considerations. Area under Kharif = 1500 ha; Area under Rabi = 3000 ha. Delta for Kharif and base period are 120cm and 140days. Delta for Rabi and base period are 40cm and 160days.

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