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Total No. of Questions : 09] [Total No. of Pages : 03

Paper ID [CE306]

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B.Tech. (Semester - 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 x 2 = 20)*

a) What is consumptive use of water? Enumerate the factors on which it depends.

b) Define the various forms of duty.

c) Differentiate between the natural subsurface irrigation and the artificial sub surface irrigation.

d) What do you understand by balancing depth and what is its significance?

e) Differentiate between initial regime and final regime.

f) What do you understand by under drainage of lined canals and why is it provided?

g) What is the importance of drainage in irrigated lands?

h) What are the basic principles in planning of multi-purpose projects?

i) Define storage coefficient and coefficient of transmissibility.

j) What are groynes and why are they provided?

Section - B

(4 x 5 = 20)

Q2) How will you determine the depth and frequency of irrigation on the basis of soil-moisture regime concept?

Q3) Determine the time required to irrigate a strip of land of area 0.203 ha from a tube well with a discharge of 0.043 cumec. The infiltration capacity of the soil may be taken as 50 mm/hr and the average depth of water on the field is 63.5 mm. Also determine the maximum area which can be irrigated.

Q4) Design an irrigation canal to carry a discharge of 50 cumec at a slope of 0.25 m/km. The critical velocity ratio for the soil is 1.1 and Kutter's rugosity coefficient is 0.023.

Q5) What are the investigations required in the planning of irrigation projects?

Q6) What are the advantages and disadvantages of river training by embankments?

Section - C

(2 x 10 = 20)

Q7) Discuss the design considerations of open drains.

Q8) (a) Design a tube well for the following data :

Yield required = 0.05 cumec.

Thickness of confined aquifer = 25 m

Coefficient of permeability = 50 m/day

Draw down = 4m

Radius of influence = 300 m.

(b) What is a strainer and what the qualities of a good strainer? Enumerate the different types of strainers.

(a) From the following information, calculate the discharge required at the head of the canal.

Crop	Base period (days)	Area (ha)	Duty at the head of canal (ha/cumec)
Sugarcane	230	900	580
Overlap for sugar cane in hot weather	90	150	580
Wheat (Rabi)	120	750	1600
Bajra (Kharif)	120	600	2000
Vegetables (hot weather)	120	320	600

Take time factor for canal = 12/20 and capacity factor for canal = 0.8. Also calculate the design discharge.

(b) Write a short note on economics and financing of irrigation projects.

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