Paper ID [A0620]

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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) Define irrigation. What is its objective and in how many ways it benefits the nation (Mention only point).

b) Duty and Delta.

c) Minor and water course.

d) Inundation canal and perennial canal.

e) Major and Minor Projects.

f) Specific yield and specific retention.

g) Attracting and repelling spurs.

h) Shotcrete lining and cement Mortar lining.

i) Shallow and deep open drains.

j) Suspended and bed loads.

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Section - B

Q2) What are the conditions for which sprinkler irrigation is suitable. How does it differ from the drip irrigation.

Q3) What are the requirements of channel lining. Draw a lined canal section.

Q4) Design an irrigation channel in alluvial soil according to Lacey's silt theory for the following data.
Q = 10 cumec, f = 0.9, side slopes of channel = ½ (H) : 1(V).

Q5) In a drainage system, closed drains are placed with their centres 2.2 m below the ground level. The highest position of the drained water table is 1.9 m below the ground level. If the impervious layer is at a depth of 6 m below the ground level. Determine the spacing of drains. The average annual rainfall is 75 cm. Take k = 1 × 10⁻⁵ m/sec.

Q6) What are the criteria for economic evaluation of irrigation projects.

Section - C

(2 × 10 = 20)

Q7) Derive Dupuit's equation for the design of a tube well from unconfined aquifer. State the assumptions made in the derivation of the equation.

Q8) Design the guide banks for a bridge site with the following data:-
Maximum flood discharge = 10,000 cumecs, High flood level = 200 m, River bad level = 195 m, Average diameter of silt particle = 0.3 mm, Assume any missing data suitably.

Q9) Design a tube well for the following data.
  (a) Yield required = 0.10 m³/sec
  (b) Radius of circle of influence = 200 m
  (c) Coefficient of permeability = 60 m/day
  (d) Draw down = 6 m
  (e) Thickness of confined aquifer = 30 m.

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