

Mid-West University
Examinations Management Office
End-Semester Examinations -2080

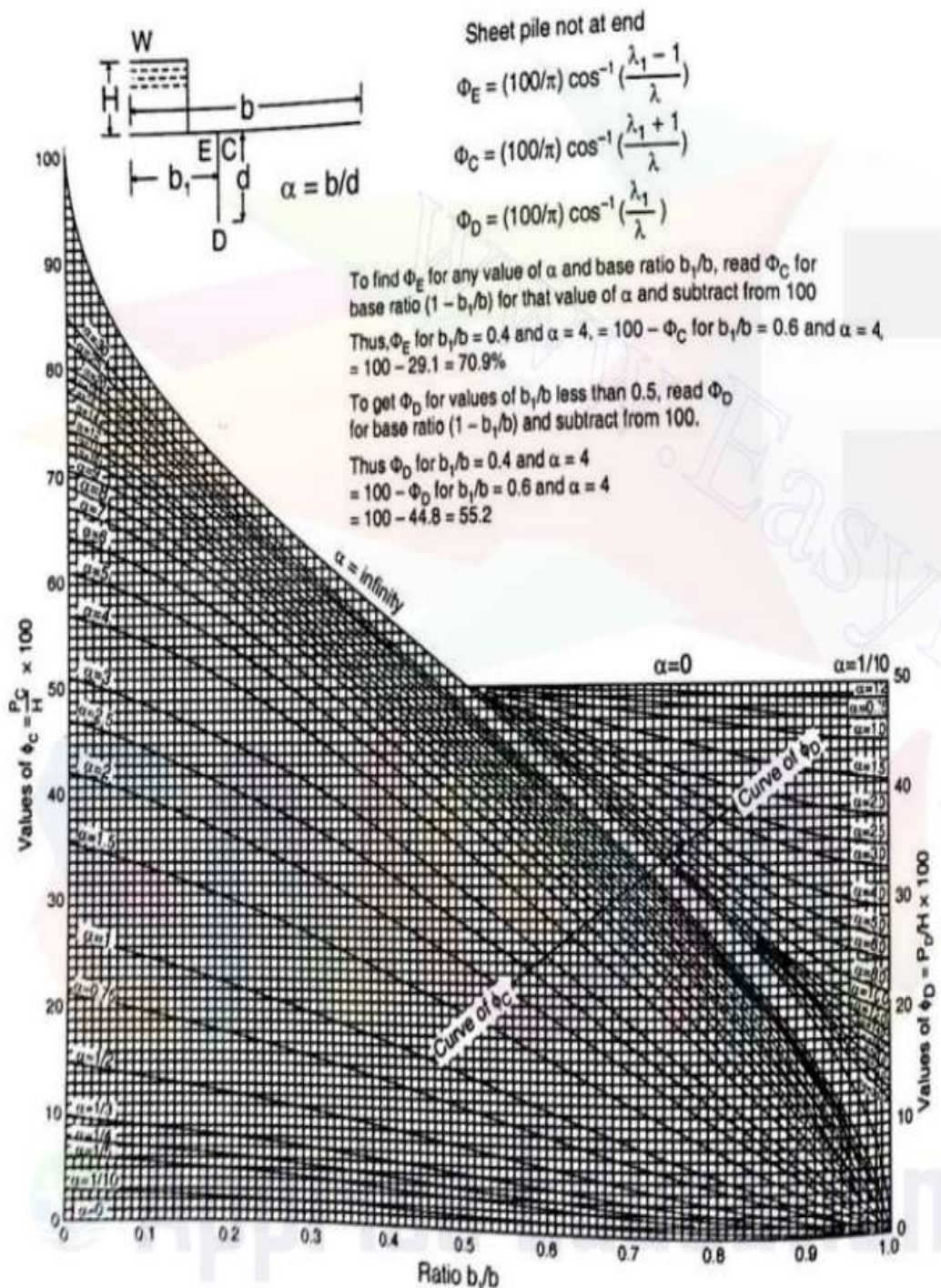
Bachelor level/ B.E. Civil /6th Semester
Time: 3 hours
Subject: Irrigation engineering (CE323)

Full Marks: 50
Pass Marks: 25

- *Attempt all the questions*
 - *Figures in the margin indicate full marks.*
 - *Assume suitable values, with a stipulation, if necessary.*
 - *Candidates are required to answer the questions in their own words as far as possible.*
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1. a) Explain the relationship between duty, delta and crop period. **(4)**
b) Enumerate different types of rivers and their characteristics. **(3)**
 2. a) Compute the depth and frequency of irrigation required for a certain crop with data given below; **(4)**
root zone depth=110cm field capacity=32%
wilting point=12% apparent specific gravity of soil=1.5
consumptive use=20mm/day efficiency of irrigation =60%
Assume 40 % depletion on available moisture before application of irrigation water at field capacity.
b) What are the different ways in which irrigation canals can be aligned? **(2)**
 3. a) Design an irrigation channel to carry 55 cumecs of discharge. The channel is to be laid at a slope of 1 in 4500. The critical velocity ratio for the soil is 11 use kutter rugosity coefficient as 0.024. **(4)**
b) Derive an expression for the average tractive force per unit of wetted area that is generated in a trapezoidal channel section of given R and S. How does this shear stress distribution at banks differs from that at bed? **(3)**
 4. a) Design and sketch the guide bund including the launching apron to train the river: **(5)**
if, Maximum discharge in the river = 7000 cumec
Highest flood level = 304m
River bed level = 300m
Average diameter of river bed material = 0.15mm
b) design and explain the principles for Sarda type fall. **(7)**
 5. a) Design an irrigation outlet for the following data: **(3)**
Full supply discharge of outlet =50lit/sec
FSL in distributary on u/s side of outlet= 300m
FSL in water course on d/s side of outlet=299.92m
Full supply depth in distributary on u/s side of outlet=1.05m
b) Design a cross drainage structure if the following data at the crossing of a canal and a drainage are given. **(8)**
Discharge of canal=60 cumecs
Bed width of canal=30m
Full supply depth of canal=1.5m
Bed level of canal=306.4m
Side slopes of a canal =15H:1V
High flood discharge of drainage =480 cumecs
High flood level of drainage=307m
Bed level of drainage =304.5m
General ground level =306.5m

6. a) In a tile drainage system the drains are laid with their centres 2.8m below the ground level. The impervious layer is 15m below the ground level and the average annual rainfall in the area is 80cm. If 1% of the annual rainfall is to be drained in 24 hours to keep the highest position of the water table to 1.5m below ground level, determine the spacing of the drain pipes. Coefficient of permeability may be taken as 0.002cm/sec. (3)
- b) What are the objectives of water user organization and also explain the operation and maintenance of irrigation system? (4)

The End



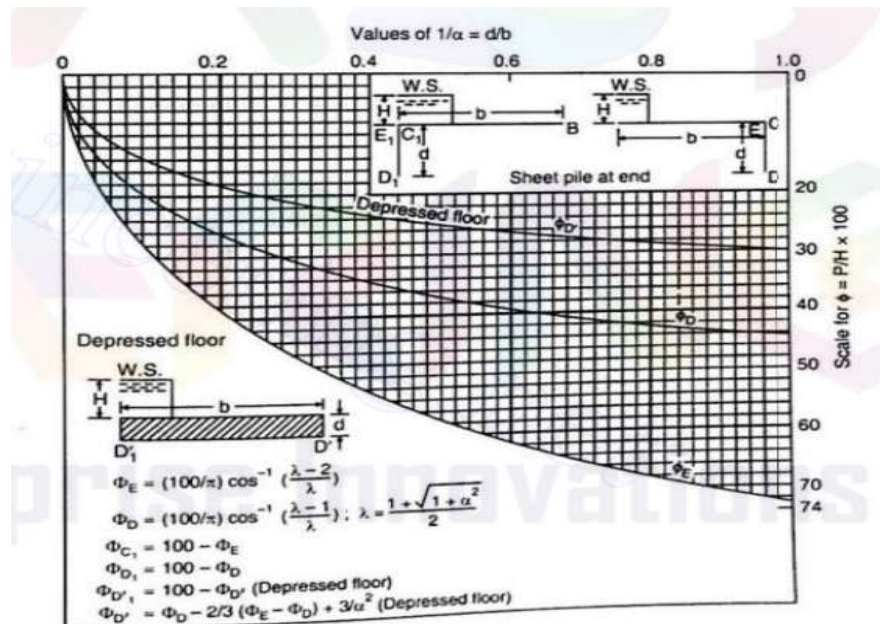


FIG. 12.14. KHOSLA'S CURVES FOR CUTOFF AT D/S END.

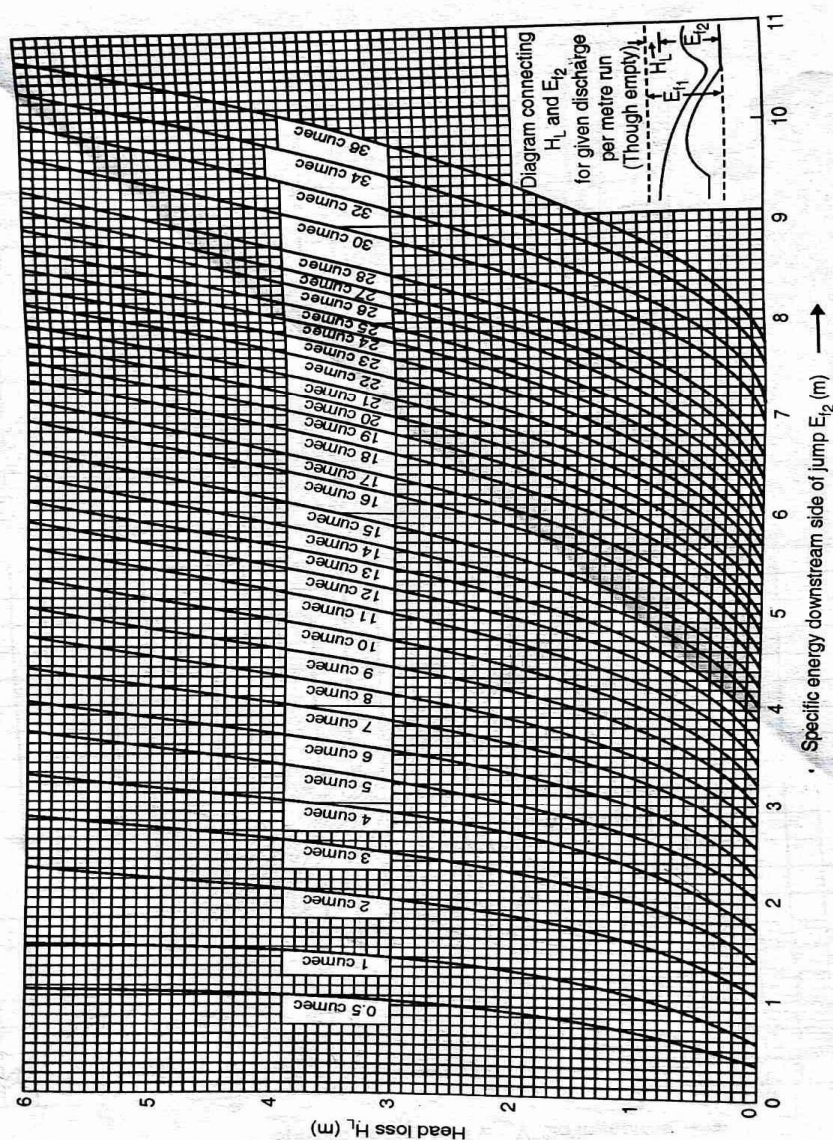


FIG. 12.26 BLENCH CURVES