

III B.Tech–II Semester-Supplementary Examination, November-2005

IRRIGATION ENGINEERING

(Civil Engineering)

Time : 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

Note : Khosla's charts are to be provided

- 1.a) Explain various types of irrigation. [8]
- b) Compute the depth and frequency of irrigation required for a crop with data given below:
Field capacity of soil = 30 %
Permanent wilting point = 13 %
Effective depth of root zone=80cm
Consumptive use per day = 15 mm/day
Readily available moisture = 80 % of available moisture.
- 2.a) Enumerate different methods for computation of average rainfall. Explain the isohyetal method for computation of average rainfall over a catchment in detail. [8]
- b) Compute the average depth of rainfall for the catchment given below using Thiessen polygon method. [8]

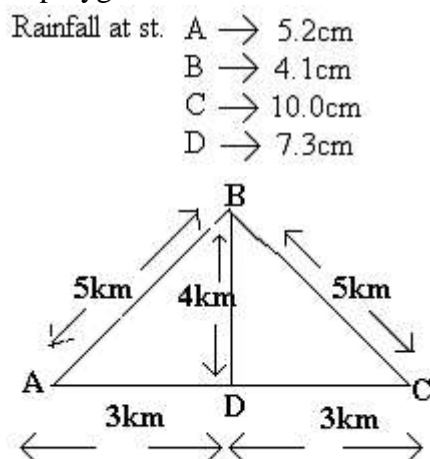


Fig : 1

- 3.a) Derive the equation for steady state discharge in a homogeneous confined aquifer for a fully penetrating well with assumptions involved. [8]
- b) A 30 cm dia. well penetrates 20 m below the static water table. After 24 hrs of pumping at 5000 litres per minute, the water level in a test well at 100m away is lowered by 0.5m, and in a well at 30 m away, the drawdown is 1m. What is the transmissibility of the aquifer? [8]

Contd..2

- 4.a) Explain Lacey's theory for design unlined canals. [8]
 b) Design an irrigation channel to carry 35 cumecs at a slope of 1 in 5500 with Manning's $n = 0.0225$ and Kennedy's $m = 0.9$ [8]
- 5.a) Draw the Layout of Diversion Head work with labels. [6]
 b) Use Khosla's formulae to calculate the % uplift pressures at the first two cut-offs for a barrage foundation profile shown in figure below applying corrections as applicable. [10]
 (slope correction may be taken as 1 in 4 slope is 3.3%)

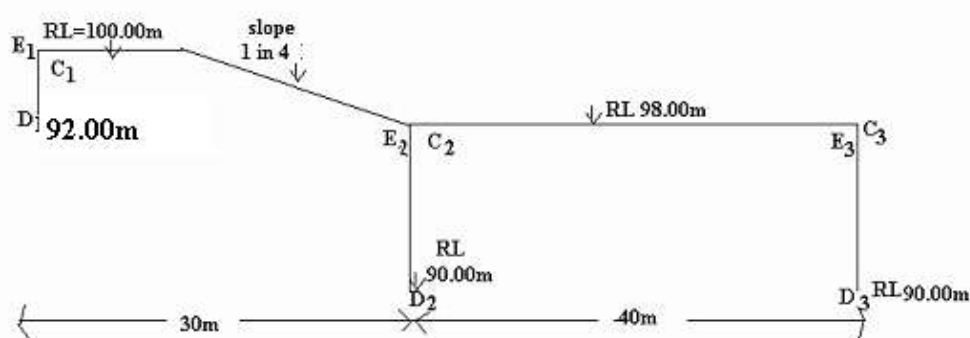


Fig : 2

- 6.a) Describe briefly the factors affecting duty. [8]
 b) Water is released at the rate of 5 cumecs at the head sluice. If duty at field is 100 Hectares/cumec and the loss of water in transit is 30 % find the area of that can be irrigated. [8]
- 7.a) Explain the following terms used in connection with ground water. [8]
 i) Aquifer
 ii) Permeability
 iii) Specific yield
 iv) Transitivity
- b) Describe briefly the various methods for obtaining the maximum flood discharge. [8]
8. Write short notes on: [4x4=16]
 a) Advantages and ill effects of irrigation.
 b) Floating type automatic rain gauge.
 c) Types of canal lining.
 d) Bligh's creep theory for seepage flow.