Benha University
Faculty of Engineering at Shoubra
Civil Engineering Department
Third Year Civil - Structures

Mid Second Term Exam
Date: Wednesday 21/3/2018
Subject: Irrigation & Drainage Engineering
Code: CVS 325   No. of questions: 2
**Duration: 1 Hour   Total Mark: 20 Marks**

Answer all the following questions   **Illustrate your answers with sketches when necessary**

الرقم الأكاديمى: ....   الاسـم: ....

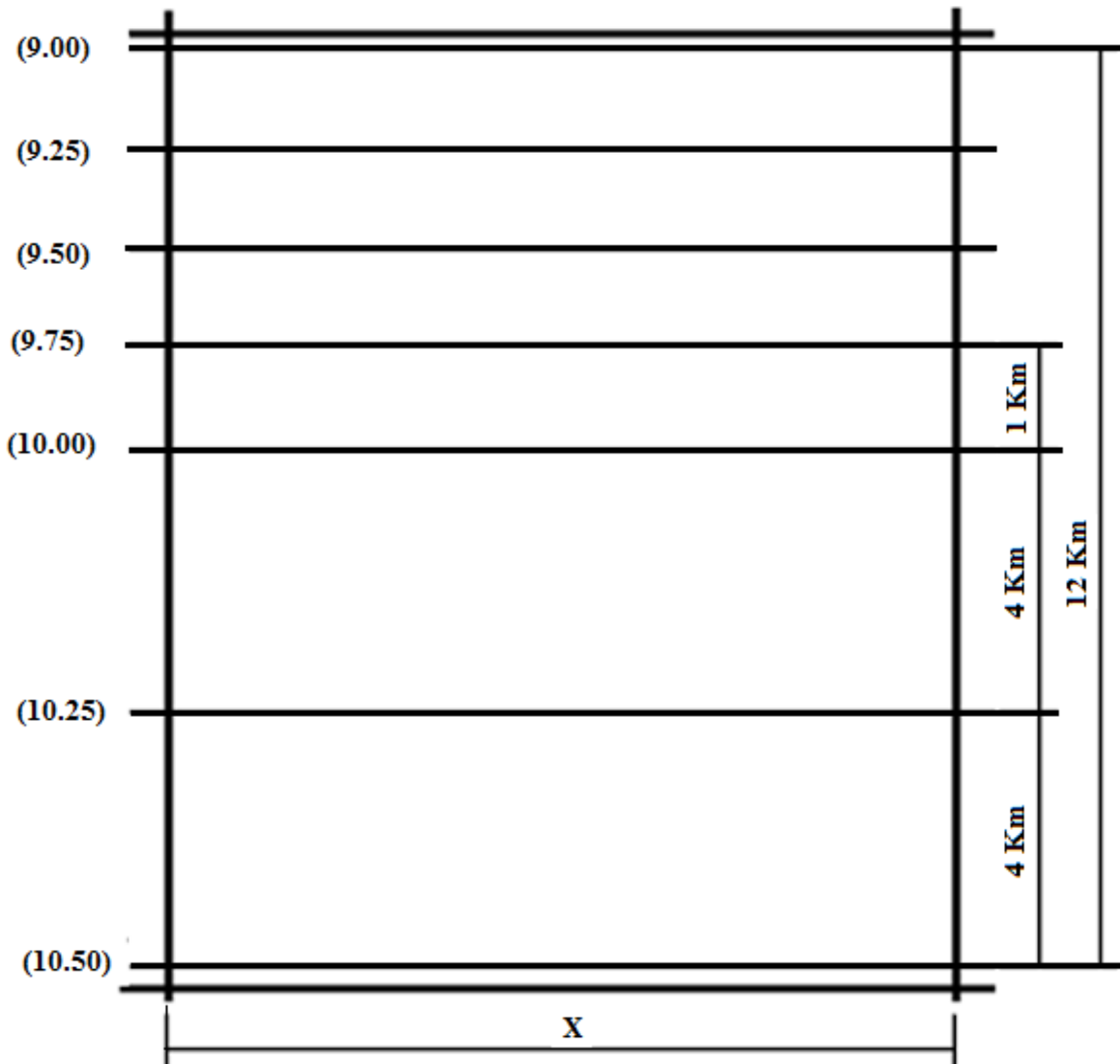## Question (1)   (10 Marks)

a) In a given year, a catchment with an area of 200 km^2 received 1.2 m of precipitation. Find the average rate of flow in a river draining the catchment, for 33% runoff coefficient?

b) Underline the figure: (1) What is the type of this sloping land? Why? (2) Determine the area served by C_3?
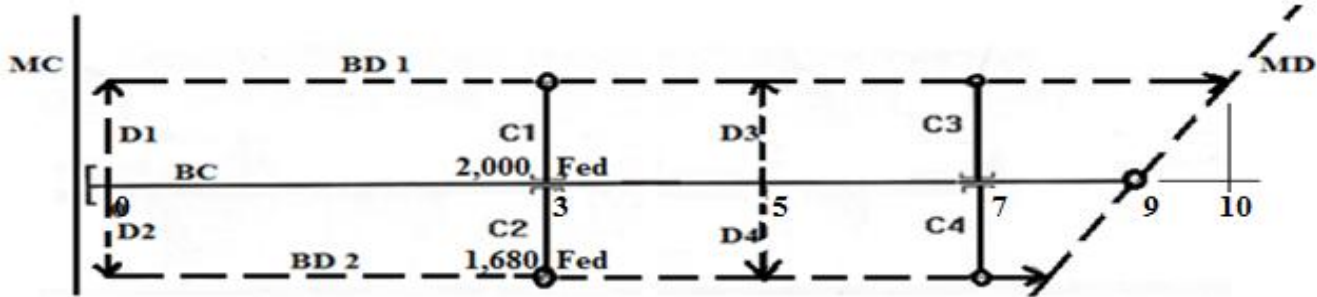
Question (2)   Plan the irrigation and drainage networks to serve this 30,000 Fed area?   (10 Marks)

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A Model Answer

Question (1)   (10 Marks)

a) Runoff coefficient = Runoff volume / precipitation volume

Runoff volume   = Runoff coefficient * precipitation volume

$= 0.33 * (1.2 \times 200 \times 10^6) = 7.92 \times 10^7 \text{ m}^3$

Runoff volume = number of seconds in a year * average rate of flow

Average rate of flow   = Runoff volume / number of seconds in a year

$= 7.92 \times 10^7 / (60*60*24*365) = 2.5 \text{ m}^3/\text{sec}$

b)   **(1)** Flat sloping, as 2-way irrigation and drainage.

     (2) $L_{C3} = L_{C1} = (2,000 * 4,200) / 5,000 = 1.68$ Km

     $A_{C3} = (2,000 * 1,680) / 4,200 = 800$ Feddan

Question (2)   (10 Marks)