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

Mid First Term Exam Date: Saturday 24/11/2017
Subject: Irrigation & Drainage Engineering
Code: CVG 315   No. of questions: 2
Duration: 1.5 Hour   Total Mark: 15 Marks

الاســم: ....   الرقم الأكاديمى: ....   الدرجة: _____
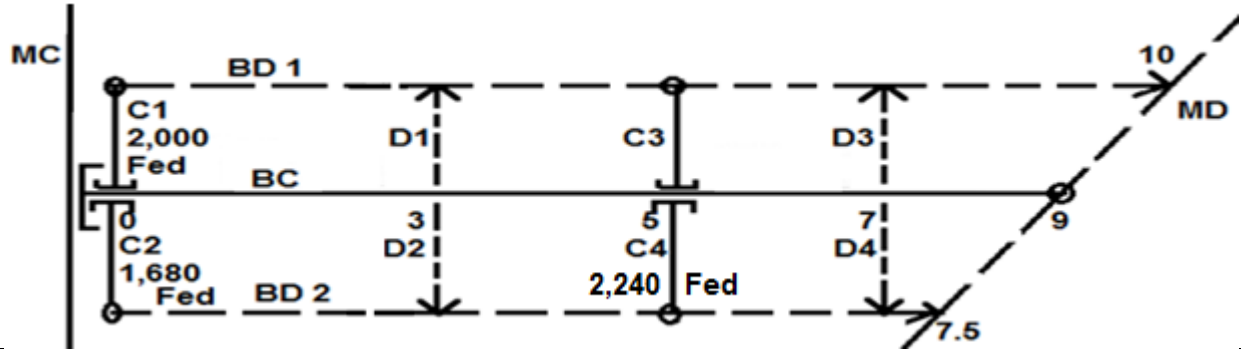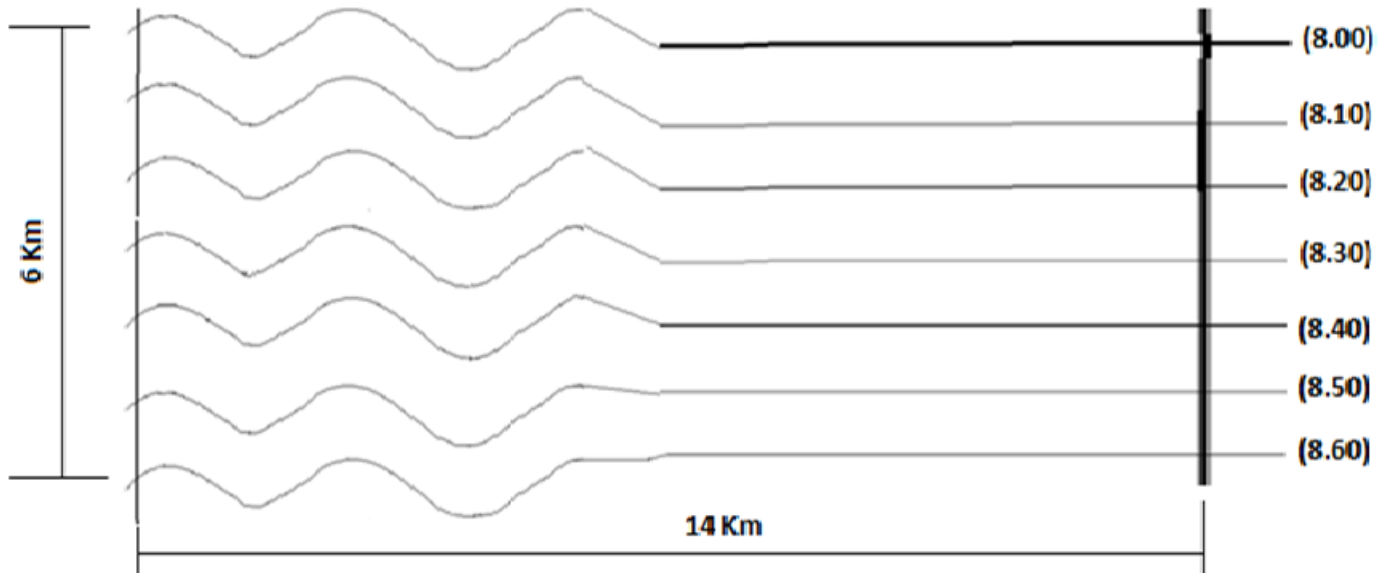
Question (1) (7 marks) The figure shows an area in middle Egypt with equally cotton and maize crops.

1-   S = 6 **OR** 16 **OR** 26 cm/km? Why?   ….....…. because ….....…..

2-   Why the length of BC is not only 5 km?   ....
     ....
     ....

3-   For a suitable irrigation rotation, ...
     calculate the maximum discharge   ....
     passing through the H R of the **BC**?   ....
     ....
     ....
     ....

4-   Determine the discharge flowing from   ....
     BD1 into the MD?   ....
     ....
     ....
     ....

Question (2) (8 marks) Plan the irrigation and drainage networks required to serve this area?

----------------- **Best Wishes** -- *Dr. Eng. Alaa El-Hazek* ----------------------

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Mid First Term Exam – 24/11/2018

Question (1)   **(7 marks)**
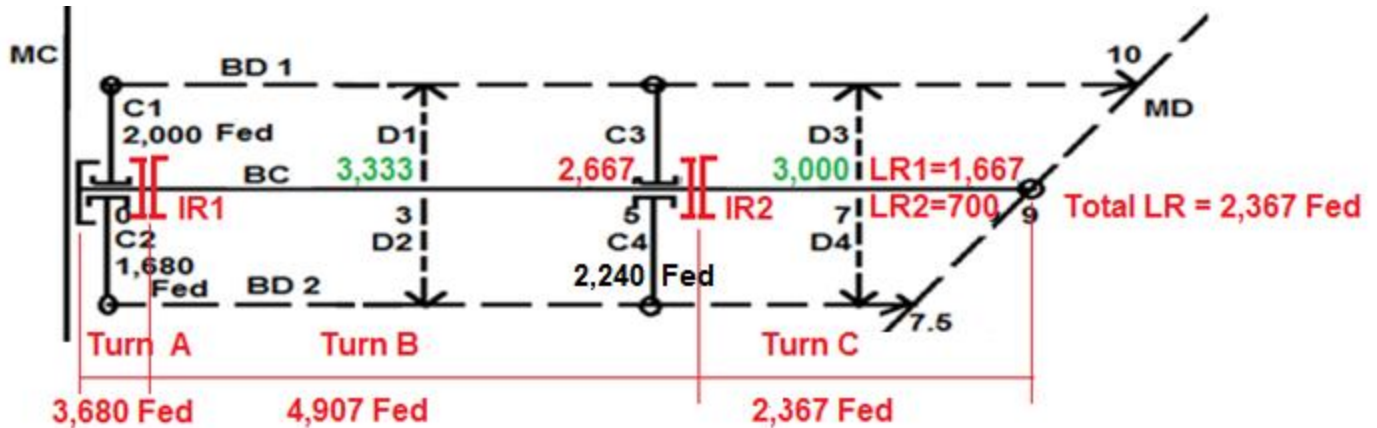
1-	S = 6 **OR** 16 **OR** 26 cm/km? Why?	<u>6 cm/km</u> because <u>2 way service for canals and drains</u>

2-	Why the length of BC is not only 5 km?	a) The BC has to be ended at a drain.
		b) $L_{C1} = (2,000 * 4,200) / 3,000 = 2.8$ Km
		$A_{LR1} = (2,800 * 2,500) / 4,200 = 1,667$ Fed
		$L_{C2} = (1,680*4,200)/3,000 = 2,352$ Km
		$A_{LR2} = (2,352 * 1,250) / 4,200 = 700$ Fed
		$AS_{LR} = 1,667 + 700 = 2,367$ Fed

3-	For a suitable irrigation rotation, calculate the maximum discharge passing through the H R of the BC?	$L_{C1} = (2,000 * 4,200) / 3,000 = 2.8$ Km
		$A_{C3} = (2,800 * 4,000) / 4,200 = 2,667$ Fed
		$A.S._T = 10,954 / 3 \approx 3,651$
		F.W.D. $= \{(100/100)x(350/6)\} = 58.3$ m^3/Fed/day
		B.C.W.D. $= 58.3 \times 1.15 = 67$ m^3/Fed/day
		$Q_{max} = (67 \times 4,907) / (24 \times 60 \times 60) = 3.81$ m^3/sec

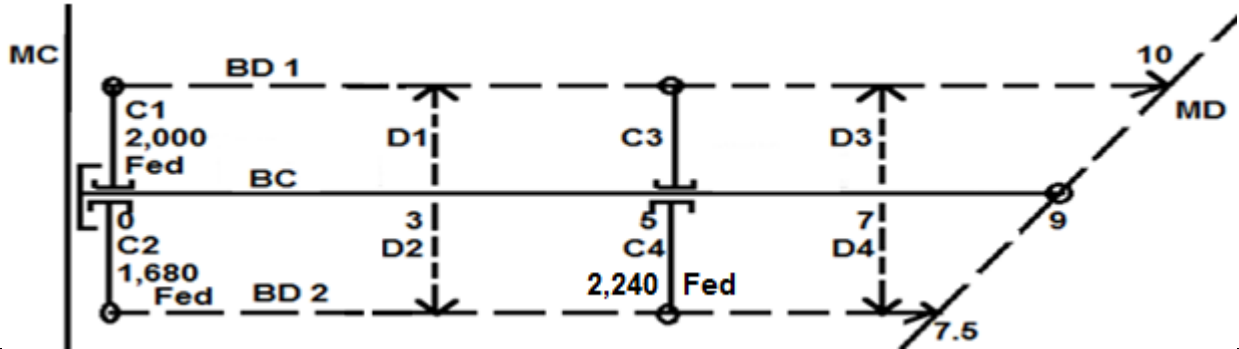| 4-	Determine the discharge flowing from BD1 into the MD?	$L_{D1} = L_{D3} = L_{C1} = 2.8$ Km
		$A_{D1} = (2,800 * 5,000) / 4,200 = 3,333$ Fed
		$A_{D3} = (2,800 * 4,500) / 4,200 = 3,000$ Fed
		A.S. $= 3,333 + 3,000 = 6,333$ Fed
		D.F. $= 0.4 * 58.3 = 23.32$ m^3/Fed/day
		$Q_{BD1} = (23.32 \times 6,333) / (24 \times 60 \times 60) = 1.71$ m^3/sec
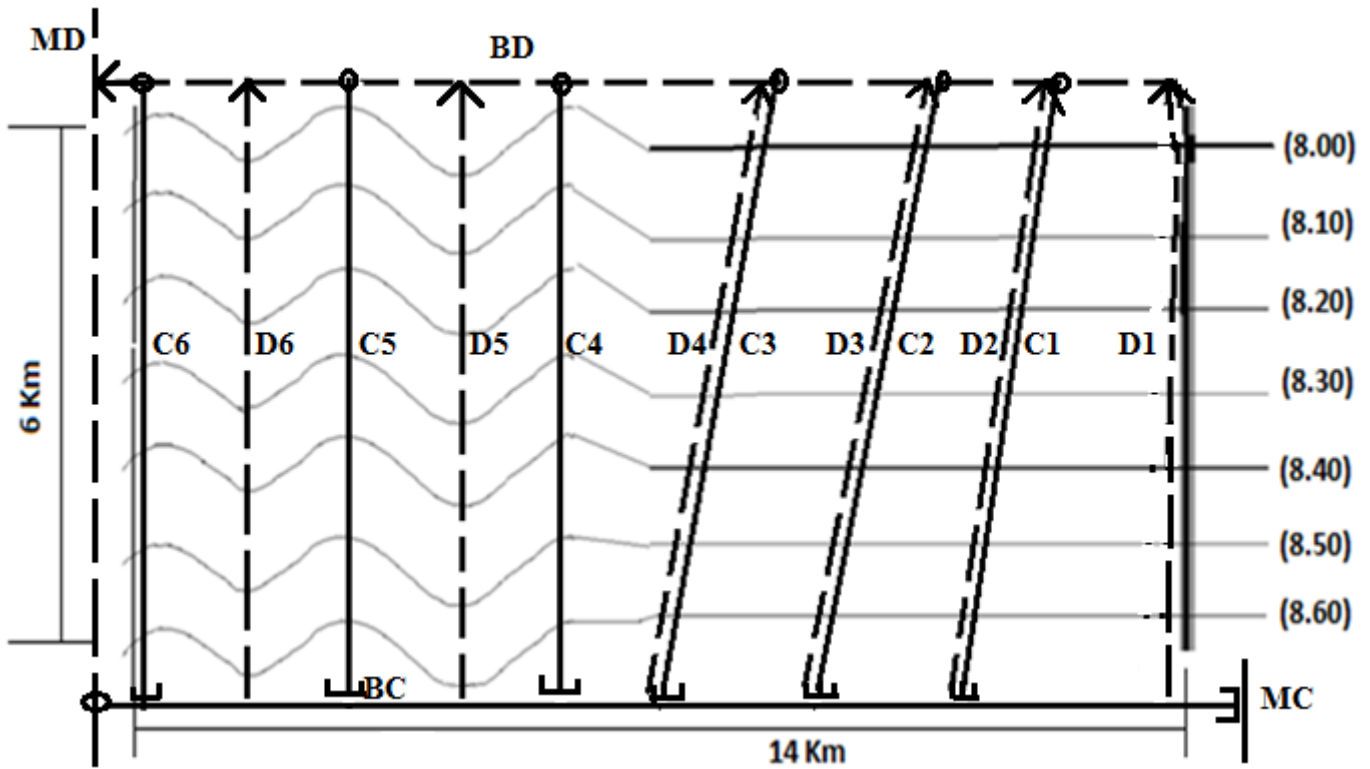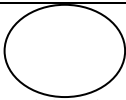
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الاســم: ....   الرقم الأكاديمى: ....   **الدرجة:**

Question (1) (7 marks) The figure shows an area in middle Egypt with equally cotton and maize crops.

1- S = 6 **OR** 16 **OR** 26 cm/km? Why?   ……..…… because ………………………………………………..

2- Why the length of BC is not only 5 km?   ………………………………………………………………………………
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3- For a suitable irrigation rotation,   ………………………………………………………………………………
    calculate the maximum discharge   ………………………………………………………………………………
    passing through the H R of the **BC**?   ………………………………………………………………………………
    …………………………………………………..   ………………………………………………………………………………
    …………………………………………………..   ………………………………………………………………………………

4- Determine the discharge flowing from   ………………………………………………………………………………
    BD2 into the MD?   ………………………………………………………………………………
    …………………………………………………..   ………………………………………………………………………………
    …………………………………………………..   ………………………………………………………………………………

Question (2) (8 marks) Plan the irrigation and drainage networks required to serve this area?

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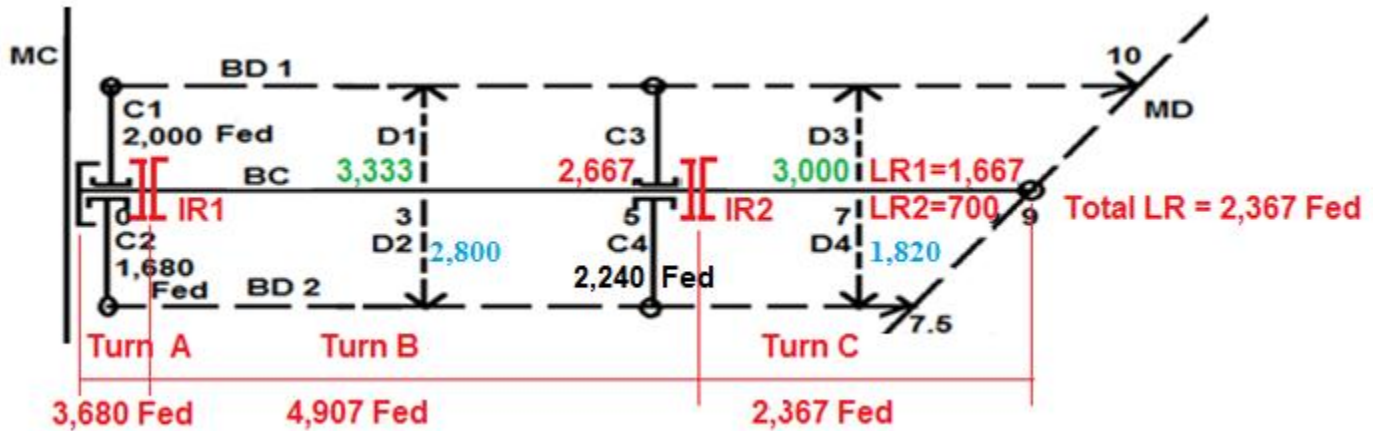
1-	$S = 6$ **OR** 16 **OR** 26 cm/km? Why?	6 cm/km because 2 way service for canals and drains

2-	Why the length of BC is not only 5 km?	a) The BC has to be ended at a drain.
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		$A.S._T = 10,954 / 3 \approx 3,651$
		F.W.D. $= \{(100/100)x(350/6)\} = 58.3$ m^3/Fed/day
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		$Q_{max} = (67 \times 4,907) / (24 \times 60 \times 60) = 3.81$ m^3/sec

4-	Determine the discharge flowing from BD2 into the MD?	$L_{D2} = L_{D4} = L_{C2} = 2.352$ Km
		$A_{D2} = (2,352 * 5,000) / 4,200 = 2,800$ Fed
		$A_{D4} = (2,352 * 3,250) / 4,200 = 1,820$ Fed
		A.S. $= 2,800 + 1,820 = 4,620$ Fed
		D.F. $= 0.4 * 58.3 = 23.32$ m^3/Fed/day
		$Q_{BD2} = (23.32 \times 4,620) / (24 \times 60 \times 60) = 1.25$ m^3/sec

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