Al-Mansoura University

Final Exam. 2nd. Semester 2011/2012
Information Systems and Prerequisites for Designing Irrigation Systems (Eng 334)
for 3rd. Year students – Agric. Eng. Program
Irrigation and Drainage Engineering Division
Time allowed: Two hours Total Marks: 60 as shown in questions
Exam Date: Tuesday 26th. June, 2012 – 1 : 3 pm
Examiner: Profs. Mahmoud Hany Ramadan and Mohsen A. Adle

Faculty of Agriculture

PLEASE NOTE THAT QUESTIONS ARE ON FOUR PAGES

PAGE ONE

Attempt All Questions

Question No. 1: (15 Marks)

Complete the following sentences as shown: **(3 Marks each):**

1) **Choose the correct word: Manufacturers of sprinklers specify a wetted diameter for all nozzle-size and pressure combinations for each type of sprinkler. Therefore, the designer must consider sprinkler ..... on the basis of these .....(specifications –diameters – discharge – pressure – spacing)**

2) **Give reasons: The good designer of irrigation systems should start his work from the sprinkler and/or emitters backwards to the pump?**

.....

.....

3) **(MCQ) Choose the most correct answer (0ne only) :**

Formation of GOOD precipitation profile is a result of :

- ☐ A) lower risers in lower wind profile
- ☐ B) higher ground slopes
- ☐ C) higher trajectory angles in higher wind profile
- ☐ D) Both A and C are correct

4) **Decide whether True (T) or False (F):**

( ) **Develop a lateral layout based on the selected sprinkler spacing and irrigation period.**

5) **Complete the next step:**

1) **Determine crop-soil irrigation needs.**
2) .....

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Question No. 2 : (10 Marks)

A) Define briefly the following terms: (6 Marks)

- **Creative data gathering**

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- **Management allowed deficit**

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- **Tailoring irrigation systems**

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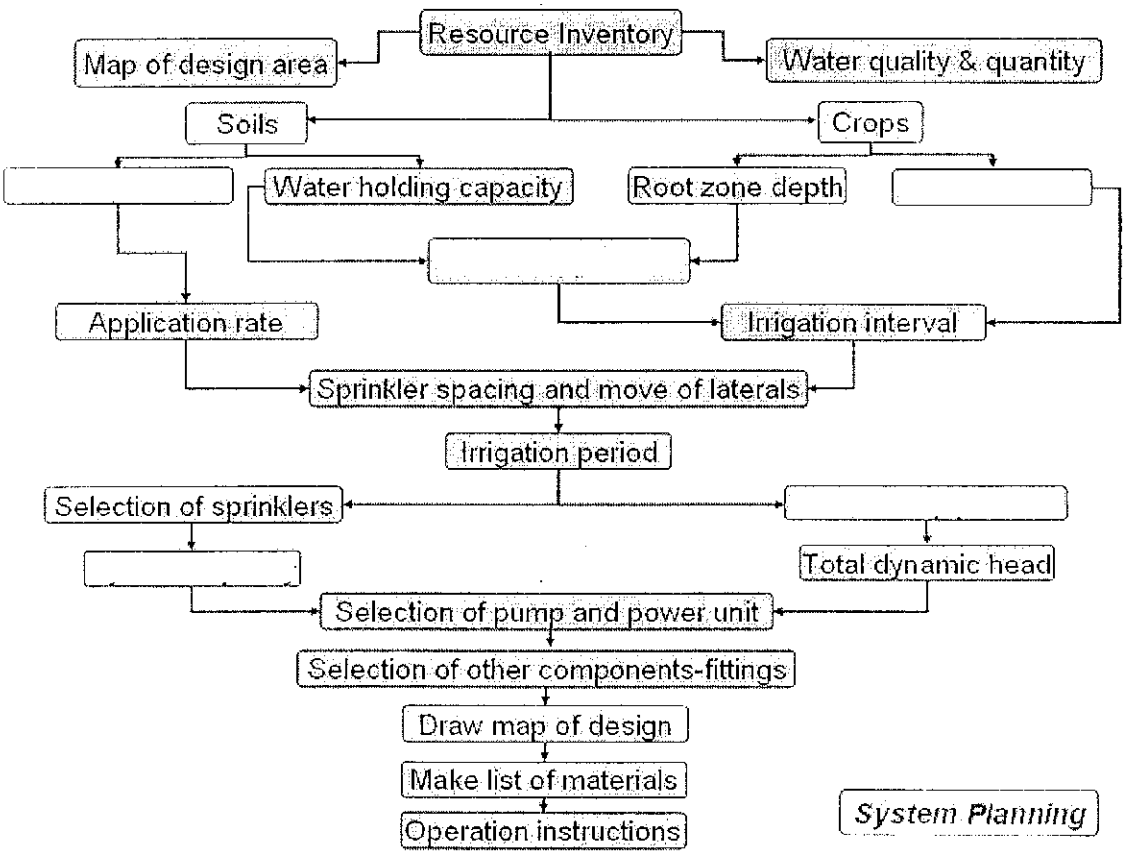
B) Complete the missing words in the following drawing: (4 Marks)



System Planning

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Question No. 3: (15 Marks)

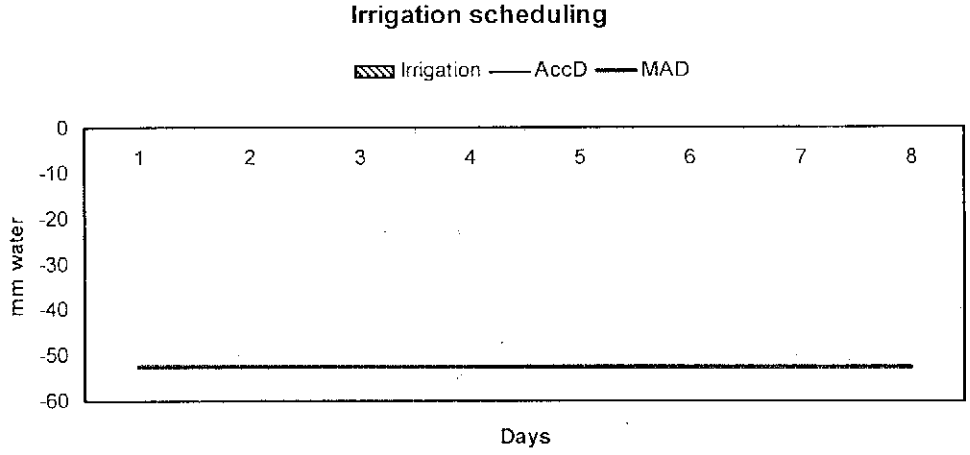
A) Complete the missing parts of the following table: (5 Marks)

Scheduling method	*Advantages*	*Disadvantages*
VQ - FI (varied amount rotation)	- - - - -	-
FQ - FI (fixed rotation)	-	- - - -

B) Complete the following Table considering the MAD= 52.5 mm/m: (10 Marks)

Day #	ET mm/day	Rainfall mm/day	Difference(Water balance mm)	Accumulated deficit mm	Irrigation scheduling
1	11	0	-11	-37.2	
2	10.8		-10.8		
3		0	-10.5	-10.5	
4	11		-11		
5		0		-33.5	
6	11.2	0	-11.2		
7	13	0	-13		
8	10.5	0	-10.5		

Then draw your results on the following graph:



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Question No. 4: (20 Marks)

Given: Design area of 100 A with crop acreages and peak-use requirements as follows:

15 A potatoes, last irrigation May 31
d_n = 60 mm, lasts 12 days in May (peak period)
Irrigation efficiency, Ea = 75%, EC_W = 2 dS/m, EC_e = 2.2 dS/m

35 A corn, last irrigation August 20
2.9-in. gross application lasts 12 days in May
3.4-in. gross application lasts 12 days in July (peak period)

50 A alfalfa, irrigated through frost-free period
3.6-in. gross application lasts 12 days in May
4.5-in. gross application lasts 12 days in July (peak period)

Irrigation period f = 10 days in 12-day irrigation interval
System is to be operated 16 hr per day
Find: Capacity requirements?

>>>END OF QUESTIONS>>> *<<<BEST WISHES>>>*