Al-Mansoura University	*Final Exam. 2nd. Semester 2012/2013* *Information Systems and Prerequisites for Designing Irrigation Systems (Eng 334)* *for 3rd. Year students – Agric. and Bio Systems Eng. Program* *Irrigation and Drainage Engineering Division* *Time allowed: Two hours Total Marks: 60 as shown in questions* *Exam Date: Saturday 1st. June, 2013 – 1 : 3 pm* *Examiner: Profs. Mahmoud Hany Ramadan and Mohsen A. Adle*	*Faculty of Agriculture*

PLEASE NOTE THAT QUESTIONS ARE ON TWO PAGES

PAGE ONE

Attempt All Questions

Question No. 1: (15 Marks)

A) (5 Marks): Complete the following statements:

1) The difference between Growth and net irrigation depth is that .....

2) Formation of **GOOD** precipitation profile is a result of .....

B) (10 Marks)

Given: An 80-A potato field with dimensions of 1320 X 2640 ft
Growth application depth d = 2.7 in.;
The required sprinkler discharge qa = 4.78 gpm;
8-day irrigation interval during peak-use period;
Two sets per day (i.e. each set takes 11.5 hr to irrigate), and
40 by 50 ft sprinkler spacing layout
Determine system capacity and adjust operating conditions to meet layout requirements.

Question No. 2 : (15 Marks)

A) (5 Marks)

Give reasons for the following (Not more than two lines each):

1) The variation in the number of sprinklers operated from time to time during irrigation should be kept to a minimum?

2) Upon planning the sprinkle irrigation networks it is advised to layout laterals perpendicular to the wind direction dominated in the area under consideration?

B) (10 Marks)

In sprinkler uniformity test the field data were gathered between sprinklers 4 and 5 at 12 x 18 m spacing. The following data represent the depth caught during the 3 hrs irrigation time. Average sprinkler discharge was 2.5 qm/hr. Calculate: CV, CU, DU, % water loss and Ea.

31	38	36	34	38	32	35	36	31	35
30	29	32	33	34	30	34	32	31	29

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Question No. 3: (15 Marks)

A) (2 Marks)
Give reasons for the following (Not more than two lines):
Flow of water through the length of a closed pipeline of a given diameter causes more friction loss than does flow through a line with a number of equally spaced outlets?

B) (3 Marks)
Draw a sketch to classify emitter types according to the hydraulic characteristics:

C) (10 Marks)
If a spray sprinkler through is 2.1 m at 200 kPa. Calculate the sprinkler spacing for the following data:

A) 100 % overlapping
B) 80 % overlapping
C) 60 % overlapping

Give your opinion?

Question No. 4: (15 Marks)

A) **(5 Marks)**
Draw the relationship between pressure and discharge for the following types of emitters:
a) Laminar flow b) Turbulent flow c) Pressure compensating
Write the exponent value of the discharge equation. Determine which one is the best?

B) (10 Marks)
Given:
A point source emitter with q=4 l/h operating in an orchard with a sandy loam soil where the root depth is 1.5 m and the saturated hydraulic conductivity, Cs= 7×10^{-6} m/s

Find:
The width, w, of the wetted soil bulb.
The sensitivity of w to changes in Cs and of w and z' to changes in q.

<<<BEST WISHES>>>