

MAJOR TEST

1. (a) What do you understand by the crop Reference Evapotranspiration
 (b) Describe the factors which affect the Crop Evapotranspiration (6)
2. (a) What do you understand by the term scheduling? Which are the usual schedules prevalent in irrigation systems? (4)

- b) Prepare the field irrigation schedule for Maize using the graphical procedure and assuming that a variable depth and variable interval method has to be used. The following data is available:

Ground water contribution is negligible

Growing season is May to August

Total available soil moisture is 140 mm/m depth

	May	Jun	Jul	Aug
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W_b	70			
P_a	20			
ET_m (mm/day)	3.6	7.1	10.1	6.5
D (m)	0.5	1.0	1.2	1.2
p	0.75	0.5	0.4	0.55
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- (8)
3. (a) What are the advantages of the Sprinkler System over the conventional irrigation system. (6)
- (b) A multiple outlet pipe has 100 emitters, an inlet pressure of 10m and a head loss equal to 15% of average pressure. If the expression for head loss in sprinkler lateral is also true for the drip lateral, find the pressure at the farthest emitter, the average pressure and the average and minimum discharge assuming that lateral is level. The emitter's discharge in lit/hour is given by

$$q = 0.9 H^{0.685} \quad (8)$$

4. (a) What are the salient advantages of a drip irrigation system over sprinkler irrigation system? Draw a schematic diagram showing the typical components of a point source emitter. (6)
- (b) If the operating pressure in a lateral is 8 m and the design discharge is 4.5 l/h, compute the length of the long path emitter if the diameter of the micro tubing is 1 mm and kinematic viscosity of water is $1 \times 10^{-6} \text{ m}^2/\text{s}$. What will be the length requirement if the design discharge increases to 35 l/h. (8)
5. (a) Derive an expression for the Fractional Advance Ratio (FAR) assuming that the Time required for the advance curve to reach end of field (T_t) is 1/4th the Time required to infiltrate net irrigation requirement (T_n) in furrow irrigation. Take $\alpha = 0.6$
- b) The following data were obtained in a field test in a border strip irrigation of wheat crop in sandy soil

$$q = 1150 \text{ cm}^3 / \text{mint/cm}$$

$$d = 7.47 \text{ cms.}$$

If the functional relationship between accumulated infiltration and elapsed time is represented by the equation

$$Y = 0.52 t^{0.72} + 0.66$$

Determine the distance advanced by the water front 45 minutes after the start of irrigation.

(6+8)