as largest water content of soil at which Indictor plant growing in soil will to recover when placed in homid chamber.

(c) **Available and readly available moisture content :-**

The amount of water that can be stored in a soil profile and be available for growing crops is called available moisture content That water which can be easily extracted from soil is called readly available moisture content.

D) **Optimum utilization of water :-**

if a crop is sown and produced under absoult Identical condition using different amount of water depth the yield is found to vary the yield Increase with water and reaches certian maximum value and than falls down.

Kharif Rabi Ratio:-

The area is Irrigated for rabi is more than the Kharif crop. This ratio is proposed areas, to be Irrigated in Kharif season to that in Rabi Season is called Kharif Rabi ration. The ration is generlly 1/2 i.e Kharif area is one half of rabi area.

QNO3

Part "A":

a) Field capacity:-

Field capacity is that amount of water present in soil after removal of excess of water.

This process takes 2 to 3 days Retention ~~cusove~~ is ~~take~~ used to determine field capacity.

b) Permanent willting point:-

Permanent willting point is defined

(D) Explain crop season (Rabi and Kharif) and Kharif Rabi ratio:-

Ans: Different crops required different climatic condition, temperature and photoperiods for their growth and complete of their life cycle.

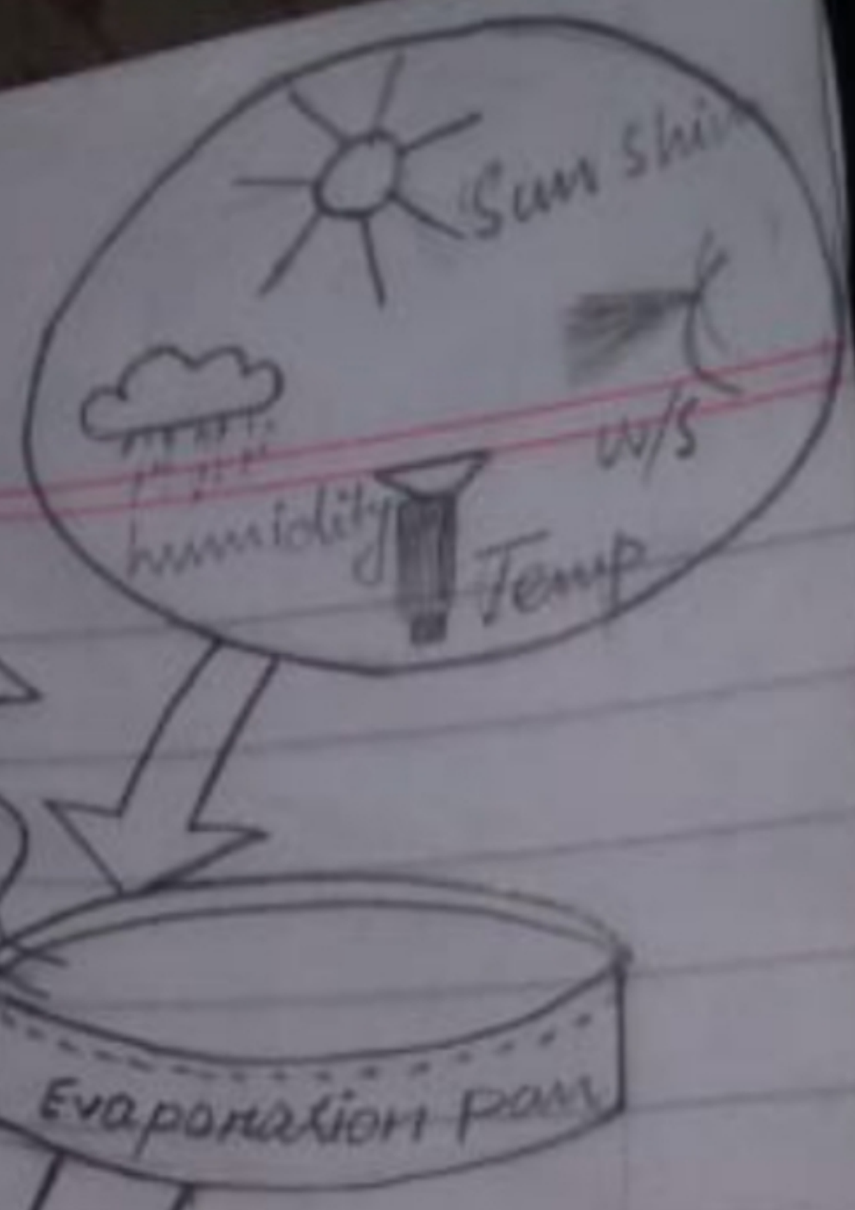
Kharif:-

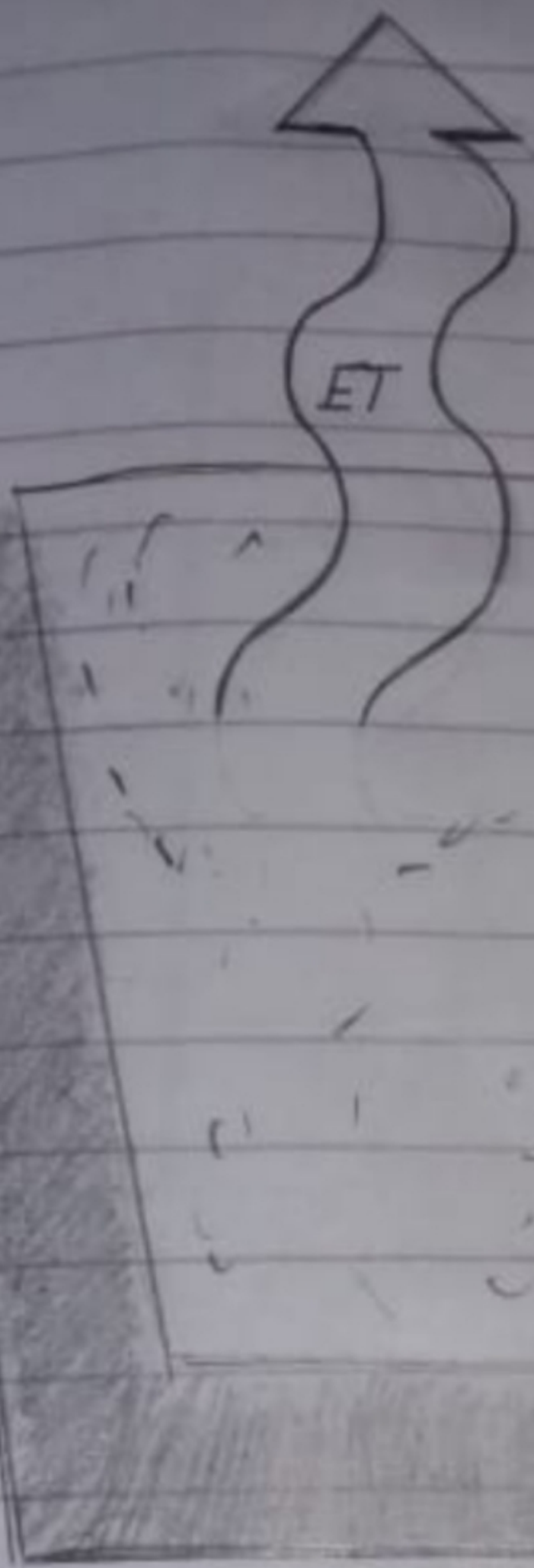
There are some crop which are grown in rainy season, called the Kharif season from mth of June to october i.e pea, maize, cotton etc are Kharif crop.

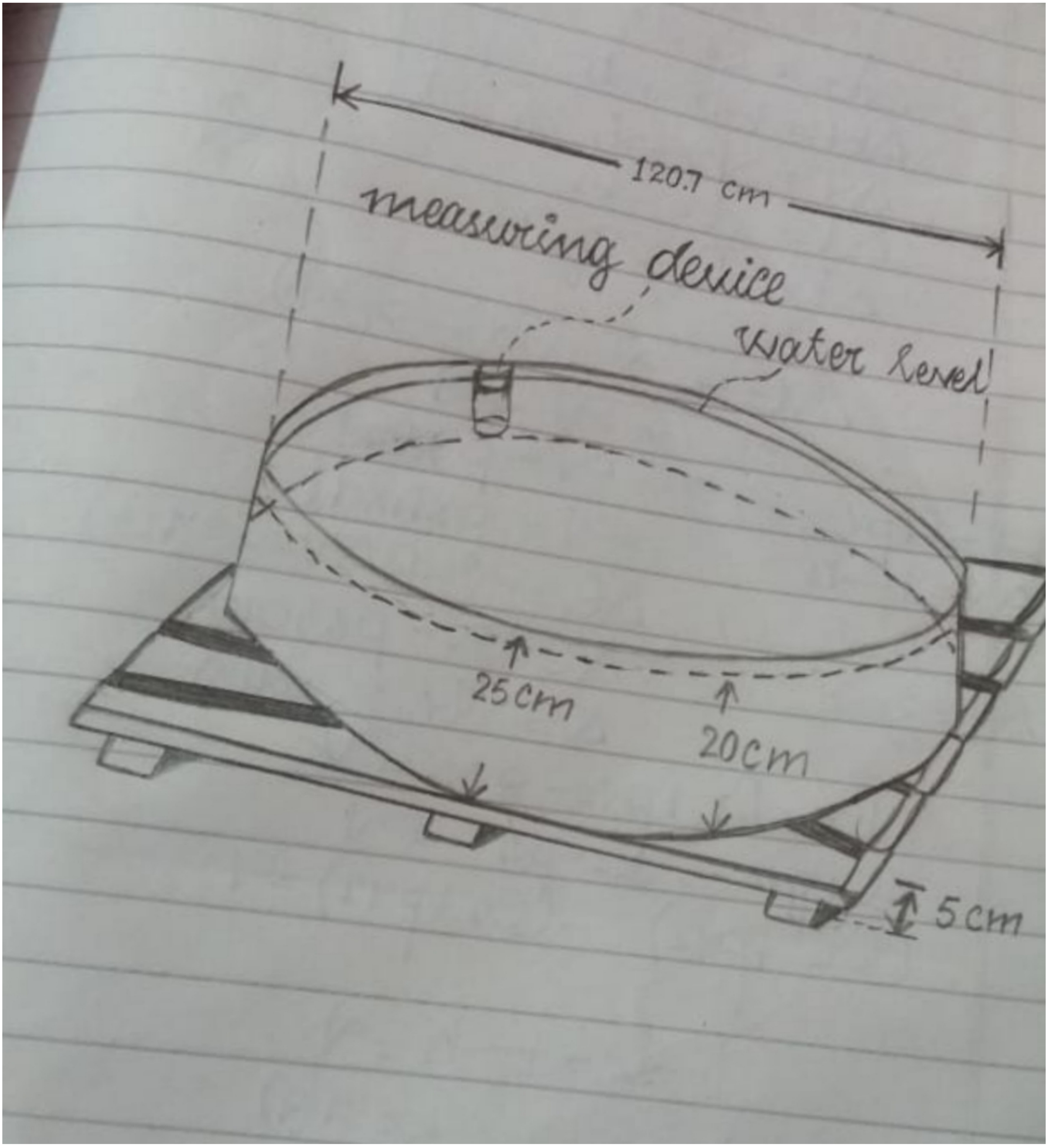
Rabi :-

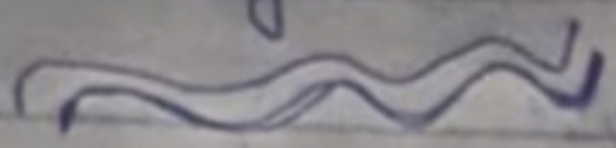
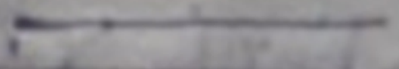
Some of crop are grown in the winter season, called the Rabi season from november to April i.e wheat, gram, peas, etc are Rabi crop.

Part (C)






120.7 cm
measuring device
water level
25 cm
20 cm
5 cm

Irregular	Plain
	
Surface are is large the sunlight is high the evaporation is high the consumptive use is high	Surface area is small the sunlight is less the evaporation is less the consumptive use is less

(b) Given data:-

Useful rain fall = 10

water application Efficiency (η_a) = 80%.

~~Consum~~ commulative consumptive use (CU) = 40cm

Required:-

Field Irrigation requirment (FIR = ?

Consumptive Irrigation Requirment CIR = ?

by formula

consumption Irrigation Requirment CIR

= CU - Re ⇒ 40 - 10

CIR = 30 cm

$$FIR = \frac{CIR}{\eta_a} = \frac{30}{0.8} = 37.5cm$$

FIR = 37.5 cm

Q2 'A'

Q Explain the factor affecting consuptive use :-

Ans. **Factor affecting consumptive use :-**

1) **Humidity and climatic condition :-**

→ if Humidity is high than there is less space in the air particles to accom-date more water hence water which present in root zone will not be able to ~~comect~~ come out hence evaporation will be less Resulting in less value of consumptive use.

climate → summer → E ↑↑ → CU ↑↑

) **Soil Topography :-**

High Permeable are Sand	low permeable clay, silt
High permeable the evaporation is high The void are larg the evaporation is high easy	The evaporation is low The voids are small Evaporation is difficult and EU is low.

(b)

Significance of Duty of crop:-

if total area which is to b irrigated as know and duty of water as also know than we can calculated the total discharge which is required to be supplied from the canal

A → (ha)

D → (ha / cumec)

$$Q = A / D$$

if total discharge which as to be Required at the field is known and duty of water as also known we calculate the total area which can be irrigated

Q = (cumec) . . .

D = (ha / cumec)

$$A = Q \times D$$

coming from Kashmir and its is way Kashmir is more important than any other matter. India is always ignor the Indus water treaty and trying to stop the water in (Io K) India occupied Kashmir but pakistan take this matter to international level Indus water treaty is for to stop the war b/w PaK and India.

(4)

Explain Indus Treaty :-

The Indus water treaty b/w India and Pakistan brokered by the world Bank to use the water availible in Indus system of Rivers located in India. The Indus water treaty signed in Karachi b/w India & Pakistan in Sep 19th 1960 as an exemplary model of conflict relalation in Internation politics The Treaty b/w India and Pakistan according to which the water of three eastren rivers namely Ravi, Sadlij and Beas, were allowed for India to use while three weastren river Indus, Jehlom and Chenab were given to pakistan to use the water being the upper reparater was barred to restrict the flow of westren river. This was signed in 1960. The bilaterd relation b/w pakistan have been rather capricious since the partition of 1947. The relation was not good because of Kashmir. we fight three war with India on Kashmir : its all for the water that are

(B) if wheat required about 9 cm of water after every 35 days and the base period or crop period of wheat is 140 days Find out the Delta for wheat:-

Given data

water ~~wheat~~ required of wheat = 9cm

Days Interval = 35 days

Base Period = 140 days

Delta of wheat (Δ) = ?

Solution:

35 days = 9cm

140 days = Δ

$$\Delta = \frac{9\text{cm} \times 140 \text{ days}}{35 \text{ days}}$$

$$\Delta = 36 \text{ cm}$$

As 1 Hectare = $1000\ m^2$

$1.m^2 = 1104H$

Then equation (1) become

volume of water $1m^3$ sec in B day = $86400\ B\ m^3$ =

$86400 B m^2 m$ = $86400 B \times 1104 H$-m volume

of water $1m^3$ sec in "B" day = $8.64 \times BH$-m

Depth of water required by crop, A = Volume

Area $A = 8.64 \times B\ H$-m

$HA = 8.64 \times B\ D\ m$

In F.P.S system:-

Let Duty = D (Acres/cusecs)

Delta = A feet Base period = B day by definition

one cusec of water flowing continously for "B" day given a depth of water "A" over an are D acres)

Therefore $\Delta = 8.64\ B/D\ m = 864\ B/D\ cm$

where Δ is an cm, B is in days,

D is duty in ha/comec.

In F.P.S unit $\Delta = 1.98\ B/D$ ft

Where Δ is in ft, B in days and D is cres/cusec

Define "Delta" and duty and derive their relationship in MKS and FPS system:-

Delta :-

A crop required the total depth of water during the entire period the crop is in the field is called Delta. It is denoted by "Δ"

Duty :-

The area of land that can irrigated with unit volume of Irrigation water. It is a relation b/w the Irrigated crop and the quantity of Irrigation water need during the entir period of the growth of the crop.

Relationship b/w duty and Delta:-

Let Duty = D, Delta = A meters Base period = B days By definition.

Volume of water $1 m^3$ sec in one day =

$1 \times 24 \times 60 \times 60 = 86400 m^3$

Volume of water $1 m^3$ sec in B day =

$1 \times 24 \times 60 \times 60 = 86400B m^3 = 86400 m^2$

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