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Seetim ⇒ Senior.

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IQRA NATIONL UNIVERSITY.

Q.NO # 01 :-

Part (a) :-

Delta :-

A Crop needs a certain amount of water at fixed interval through out its base period. depth of each watering 5cm (2") - 10cm (4")

- Def :- the depth of water in cm or inches required for the crop through out the base period is called delta of the crop.

Ex :- Rice : 10cm of water at interval of 10 day. Base period is 120 days.

Duty of water :-

the duty of water in the relationship b/w the volume of water by the area of crop its mature. volume of water is generally expresed by a unit discharge flowing for a time of base period of the crop.

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1 cubic m per sec or 1 cu.ft/sec of water for B days mature D hectares or acres of land. then the duty of water for that particular crop is D hectare/Cumec or D acres/cusecs.

Derive their Relation Ship in MKS & FPS Systems. of Duty & Delta.

- Let there be a crop of base period B days. let one Cumec (m^3/sec) of water be applied to this crop on the field for B days.
- Now the volume of water applied to the crop during B days = V = $(24 \times 60 \times 60 \times B)\ m^3 = 86,400\ m^3$
- By def of duty, 1 m^3 of water supplied by B days matures D hectares of land. this quantity of water (V) matures D ha of land

P.T.O

or 10^4 D m^2 of area. Total depth of water applied on this land = volume/area = 86400 B/10^4 D = 8.64 B/D m. By def. this total depth of water is called delta Δ therefore Δ = 8.64 B/D m. 864 B/D cm where Δ is in ha/cumec.

In FPS units Δ = 1.98 B/D ft. where D is in ft, B in days by D is in Acres/cusec.

Part B:

Sol:- Wheat require 9 cm of water after every 35 days.

Delta = depth of water through out its base period.

$$\text{Base period} = \frac{140}{35} = 4$$

$$\text{delta} = 9 \times 4$$

$$= 36 \text{ cm.}$$ Ans.

Part (c):

Explain indus water Treaty.

B/w pakistan and india.

- Treaty Signed at Karachi (pakistan)
- 19 Sep, 1960.
- Brokered By would Bank (than international Bank for Reconstruction & development)
- pakistan president Ayub Khan
  indian PM Jawaharlal Nehru.

Features of the Treaty:

1) three major Eastern Rivers Sutlej, Beas & Ravi were given to india

2) three major western Rivers Chenab, Jhelum & the indus were given to pakistan

3) Canal & reservoir Construction financed through Bank.

Part (D)

Significance of duty of a Crop:-

- It helps in designing efficient Canal irrigation System. Knowing the total available water at the head of the main Canal by the overall duty for all the crops required to be irrigated in different seasons of the year, the area which can be irrigated can be worked out.
- Inversely if we know the crop area required to be irrigated by their duties we can work out the discharge required for designing the Canal.

QNO# 02:

Part (a):- the factor affecting Consumptive use.

- Assignment.
- Temperature.
- Humidity in air.
- velocity of wind.
- Soil Topography

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- Sunlight etc.

Estimate of Consumptive USE:-

- the most commonly used 4 simple methods are

1) Blaney — criddle equation.
2) Hargreaves class A pan evaporatim method.

Part (B)

problems & Solutions:-

$CIR = Cu - Re$

lost in reading

$FIR = CIR / n_2$

$Cu = 40cm.$

$Re = 10cm.$

$n_a = 80\%$

(1) $CIR = 40 - 10cm.$

$CIR = 30cm.$

$FIR = CIR/n_a = \frac{30}{0.8}$

$FIR = 37.5cm$ Ans

Part (c):

Explain Class A pan evaporation (Ep) measurment with the help of a diagram.

- Ep Can be experimentally determined by directly measuring the quantity of water evaporated from the standard class a pan. this pan is 1.0 m in diameter, 25cm deep, ly bottom is raised 15cm above the ground surface. the depth of water is to be kept in a fixed range such that the water surface is at least 5cm, ly never more than 7.5 cm, below the top of plan.
- the plan evaporatin Ep Can also determined by using the Christiansen formula which states $E_p = 0.459 R.C_T. C_w. C_h. C_s. C_e.$

R_z extra. Terrestrial radiatin in the same units as Ep in Cm or mm.

C_t = Coefficient for Temperature

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C_t = Coefficient for Temp.

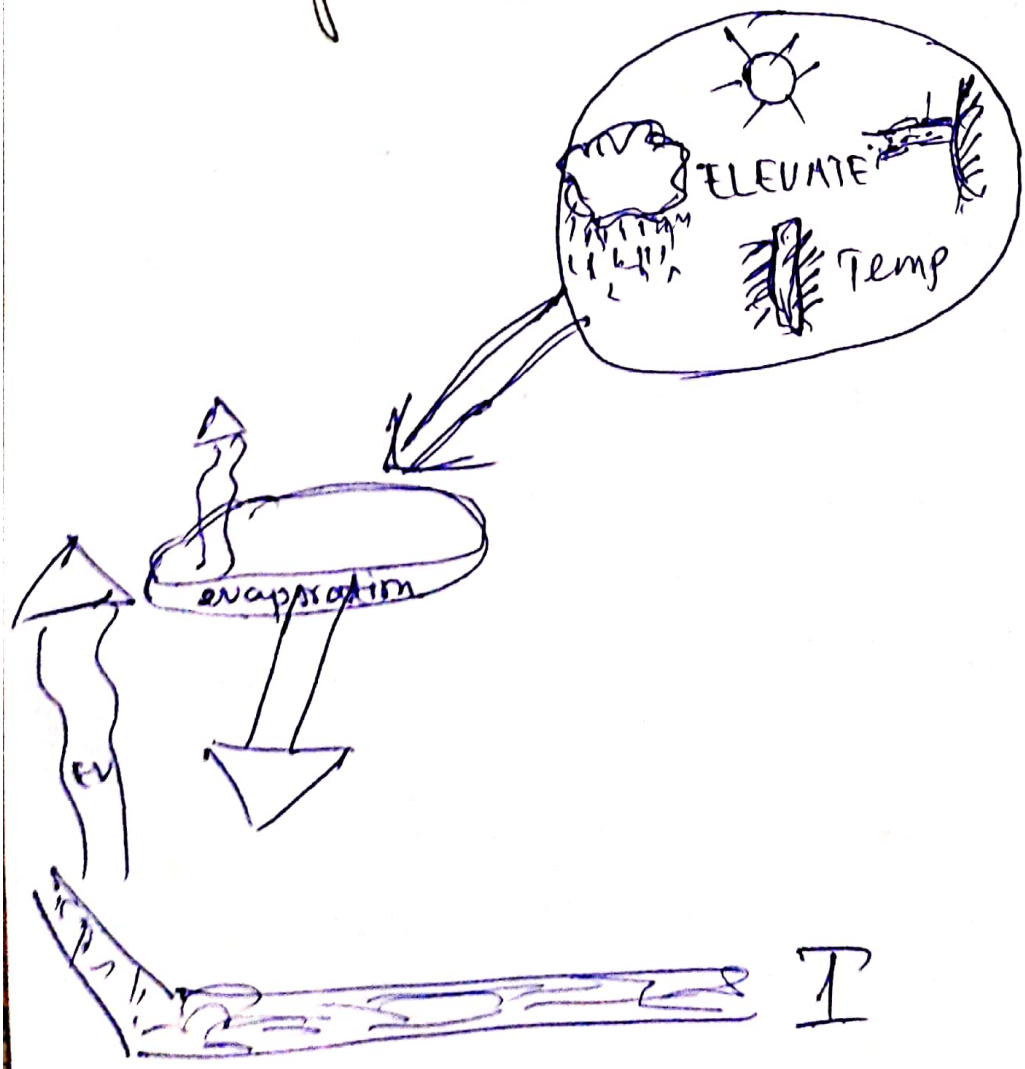
C_w = Coefficient for wind velocity.

C_h = Coefficient for relative humidity

C_s = Coefficient for percent of possible Sunshine.

C_e = Coefficient for elevation.

Diagram:



Part(D):

Explain Crop Seasons (Rabi & Kharif) & Kharif Rabi Ratio;

Ans: Rabi – 1st October to 31st March winter.

Kharif – 1st April to 30st Sept – Summer.

Karif Crops :- Wheat, Barley, Gram, Mustard potatoes.

Kharif Rabi Ratio :-

the area to be irrigated for Rabi crops generally more than that for Kharif crops. this ratio of proposed areas, to be irrigated in Kharif season to that in Rabi season is called, Kharif Ratio. this ratio is generally 1:2 i-e Kharif area is one half of Rabi area. the area to be irrigated for Rabi crops generally more than that Kharif Rabi ratio

QNO# 03:

a) Field Capacity:- When all gravity water has drained down to water table, a certain amount of water is retained by surface soil - this water which can not be easily drained under the action of gravity is called F.C period of drainage = 2-5 days F.C is measured after 2 or 5 days

Part (B):

Permanent wilting point:-
A plant can extract water from soil till a permanent wilting point is reached P.W.P is that water content at which a plant can no longer extract sufficient water for its growth & wilts up.

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Part (c)

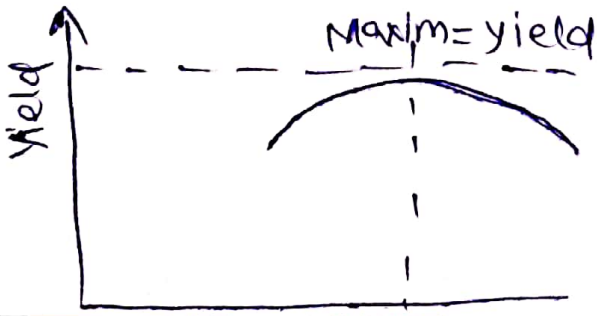
Available or readily available moisture Contents:-

It is that portion of available moisture which is mostly easily extracted by plants or is approximately 75 to 80% available moistures.

Part (D):

Optimum utilizatim of water:-

If a crop is sown or produced under absolutely identical conditions using different amounts of water depths, the yield is found to vary. the yield increases with water, reaches a certain maximum value or then falls down as shown in the following figure



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