## Answer # 1: "A"

### Anti water- loging:

* Delay in cultivation oprations such as tilling, ploughing etc.
* Weed growth.
* If WT has risen up or plant root happens to come up in capillary zone water capillary thus continous upward flow of water to land surface is established.
* Salts rise with water & depos-u its in roots zone.
  It reduce osmotic activity of plant decays.

### Causes of water- Logging:

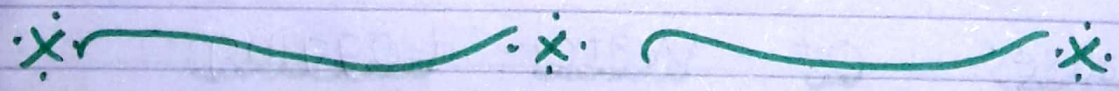
* Intensive Irrigation.
* Seepage of water from adjoining high lands.
* Seepage of water trough canal reservoirs.
* Impervious obstruction.
* Inadequate surface Drainage.
* Excessive rains.
* Submergence due to floods
* Irregular & flat topogrphy.

## "B"

## Saline & alkalians soils:

They are soils that have been harmed by soluble salts. consisting mainly of sodium, calcium, magnesium chloride and sulfate and secondorily of potassium, bicarbonate, carbonate, nitrate and boron.

* PH of Saline soil is less than 8.5
* PH of alkalian soil is greater than 8.5.



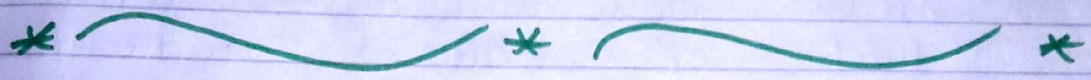
## "C"

## Reclamation of salt affected lands:

* By maintaining the water table sufficiently below the roots.
* Hence all the measures which were suggested for preventing water logging hold

good for preventing salinity of lands.

* An efficient drainage (surface and subsurface) must be provided to lower the water table in saline soils.



Answer # 09: "A"

Kennedy Procedure for canal design:

① Assume the trial value of D and put in eq ①

$$V_o = 0.546 m D^{0.64}$$

② In eqn 1:

$$Q = AV$$

$$A = Q/V$$

$$A = BD + D^2/2$$

$$P = B + D\,S^{1/2}$$

For assumed D determine B

Find $R = A/P$

(3) Substitute the value of R in equn 2 to obtain V which will be the actual velocity for assumed dimensions.

(4) If the velocity worked out from equn 2 agree with that of obtained with the Equ. 3. Then the assumed depth is correct. Otherwise repeat the procedure with changed value of D.

Q 8 :- 'B'

Sol:

Assumed D = 1.79 m

$V_t = 0.55 m D^{1/2} = 0.55(1)(1.79)^{1/2} = 0.778 m$

$A = \frac{Q}{V_t} = 14.16/0.778 = 18.2 m^2$

$A = BD + 0.5 D^2$ for $Z = 1/2$ or 0.5

$18.2 = 1.79 B + 0.5(1.79)^2$

$B = 9.79 m$

$P = B + \sqrt{5} D = 9.79 + \sqrt{5}(1.79) = 13.560 m$

$R = A/P = 18.2/13.560 = 1.349 m$

$$V_c = \frac{23 + \frac{1}{N} + \frac{0.00155}{S}}{1 + \left(23 + \frac{0.00155}{S}\right)\frac{N}{\sqrt{R}}}$$

$$= \frac{23 + \frac{1}{0.095} + \frac{0.00155}{1/5000}}{1 + \left(23 \frac{0.00155}{1/5000}\right)\frac{0.095}{\sqrt{1.349}}} \sqrt{1.349/1/5000}$$

$V_c = 0.771 m$

$\approx 0.778 m$

Result

$B = 9.79 m$ $D = 1.79 m$

Answer # 03 "A"

Inital regime:

* When only bed slop of channel changes but the cross section remains same then also no silting or scouring take place But this is rare.

Final regime:

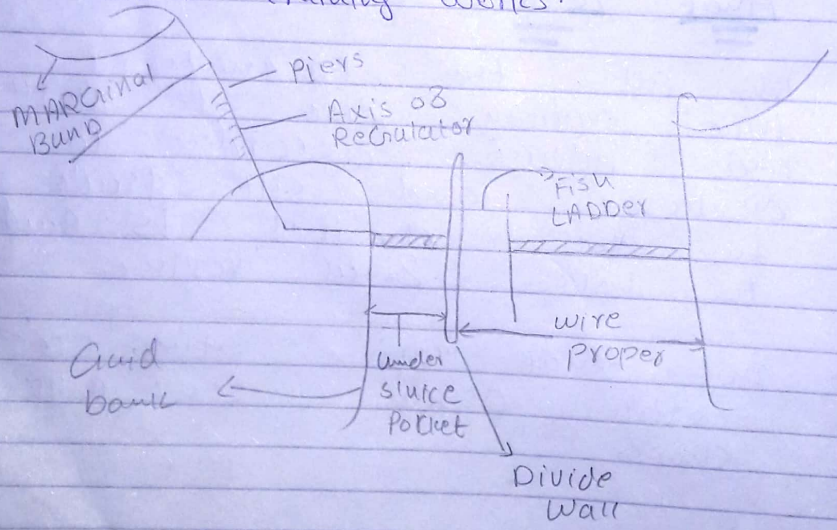
If all the parameters have equaly free to vary and adjust according to discharge and silt grades the the channel is said to have final regime.

* In final regime the cross section assume semi ellipse shape.

Answer # 04 "A"

Components of headworks:

* Weir
* Barrage
* Undersluices
* Divide wall
* Fish ladder
* Canal head regulator
* Silt excluders / silt prevention devices.
* River training works.



"B"

## Function of Head regulators:

It regulates the supply of water entering the canal intake. It controls the silt in the canal - It prevents the silt from the entering the canal