Name: Shahzeb_Khan (final term) Section-A

Q No! 01

Part - A

Some of the measures use to control water logging are:

1- Lining of Cannals and Water Courses

it reduces seepage of water. Cannol seepage is major source of water losses. and water logging in irrigated areas and it can be controf.

2- Reducing intensity of irrigation:-

only small portion of land should receive Canal water in one particular season. Remaining area can receive water in next season by rotation.

3- By introducing crop rotation.

High water required crop should be followed by one requiring less water, and then by one required almost no water or less water.

Example: Rice followed by wheat and then by cotton.

4- Optimum use of water:

Certain amount of water gives the best result. Less or more water reduce the yield. Cultivator should be educated so that not to use more water.

Revenue should be charged on basis of quantity of water rather then the area of land.

5- Improving natural drainage of area :-

Water should not be allowed to stay in one area.

Natural flow is provided by bush and jungle cutting.

6- Pumping or Tubewells or Vertical Drainage :-

Lift irrigational should be introduced to use Gw.

Canal irrigation may be substituted by tube well irrigation.

7- Economical use of water according to need :

8- Adoption of sprinkler method of irrigation :-

Only predetermined amount of water is supplied to land.

No pecolation losses from water courses.

Q No: 01

Part-B

Saline Soil	Alkaline Soil
* Mainly Cl^- and So_4^{2-} of Na^+ but also Cl^-, So_4^{2-} and HCO^- of Ca^{2+} and mg^{2+} in Small amount	* mainly Co_3^{2-} of Na^+ but also Co_3^{2-} of K^+, Ca^{2+} and mg^{2+} in Small amount.
* Saline Soil are the soils Than here a pH in b/w 7 & 8.5 an exchangeable * Sodium percantage. below 15 %	* Alkaline Soil are the Soils That have a pH greator Than 8.5 and an exchange able * Sodium percantage greater than 15 %
* Electricity Conductivity is 4 or more mmhos/cm	* usually less Than 4 mmhos/cm.
* Organic matter content is high in saline soil.	* organic matter content is low in alkaline soil.
* Saline Salt are white or light gray in Colour	* Alkaline soil are black in colour.

Q No! 01

Part - C Reclaim Salt affected lands:

Ans:- Reclaim Salts affected lands are:.

* 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.

Q No! 02

Part-A

Kennedy's procedure for canal design

Step #01

Assume the trial value of D and put the equation 1. and determine $V_o = 0.546m\ D^{0.64}$

Step #02

In Equation 1:

$Q = AV$

$A = Q/V$

$A = BD + D^2/2$

$P = B + D\sqrt{5}$

for assumed D determine B, find $R = A/P$

Step #03

Substitute the value of R in eq 2 (Kutters and Chezys Eq) to obtain V which will be the actual velocity for assumed dimensions.

Step #04

If the velocity worked out from Eq (2) agrees with that of obtained with the eq (3) (Kennedays Eq). Then the assumed depth is Correct. Other wise repeat the procedure with the changed value of D.

Q No, 02

Part-B :

Given Data :

$Q = 30\ m^3/sec$

C.U.R = m = 1

N = 0.0225

$S = 1/5000$

First assume depth = D = 2.3 m

Step #01

$$V_0 = 0.55 \times 1 \times (2.3)^{0.64}$$

$$V_0 = 0.937\ m/sec$$

Step #02

$$A = Q/V = \frac{30}{0.937}$$

$$A = 32.017\ m^2$$

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

$$B = 12.77\ m$$

$$P = B + D\sqrt{5}$$

$$\boxed{P = 17.913\ m}$$

Step #03

$$C = \frac{75.195}{1.518}$$

$$C = 49.535$$

$$R = A/P$$

$$R = 1.787$$

$$V = C\times\sqrt{RS}$$

$$V = 49.535\sqrt{1.787\times 0.0002}$$

$$\boxed{V = 0.93\ m/sec}$$

which equall to the Vo

Q No 03

Part (A)

Answers:

accordance to the lacey's theory:

Initial Regime :-

When only bed slope 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 (perimeter, depth and slope) have equally free to vary and adjust according to discharge and silt grades then the channel is said to have final regime.

Q No! 03

Part-B :

Given data :

$Q = 30\ m^3/sec$

$m = 0.56\ mm$

Solution :

Silt factor $= f = 1.76 \times m^{0.5}$

$f = 1.76 \times (0.56)^{0.5}$

$f = 1.3$

$$V_m = \left[\frac{Q f^2}{140}\right]^{1/6}$$

$$= \left(\frac{30 \times (1.3)^2}{140}\right)^{1/6}$$

$$\boxed{V_m = 0.844}$$

$Q = AV \qquad A = \frac{Q}{V} = \frac{30}{0.844}$

$$\boxed{A = 35.54}$$

$P = 4.75\sqrt{D}$

$P = 4.75\sqrt{30}$

$P = 26.01$

$R = \frac{5}{2} \times \frac{V^2}{f} = \frac{5}{2} \times \left(\frac{(0.844)^2}{1.3}\right)$

$\boxed{R = 1.36}$

$A = BD + D^2/2$

$35.54 = BD + \frac{D^2}{2} \longrightarrow (1)$

$P = B + D\sqrt{5}$

$26.01 = B = 2\sqrt{2.236D}$

$B = 26.01 - 2.236D \longrightarrow (2)$

Put eq (2) in eq (1)

$35.54 = (26.01 - 2.236D)D + \frac{D^2}{2}$

$35.54 = 26.01D - 2236D^2 + \frac{D^2}{2}$

$35.54 = 26.01D - 2.236D^2 + 0.5D^2$

$$35.54 = 26.01D - 1.736D^2$$

$$\underbrace{-1.736D^2}_{a} + \underbrace{26.01D}_{b} \underbrace{- 35.54}_{c} = 0$$

$$a = -1.736 \quad b = 26.01 \quad c = -35.54$$

By Quardatic Equation :

$$D = \frac{-(26.01) \pm \sqrt{(26.01)^2 - 4(-1.736)(-35.54)}}{2(-1.736)}$$

$$\boxed{D = 1.52}$$

Put in eq (2)

$$B = 26.01 - 2.236(1.52)$$

$$B = 22.611$$

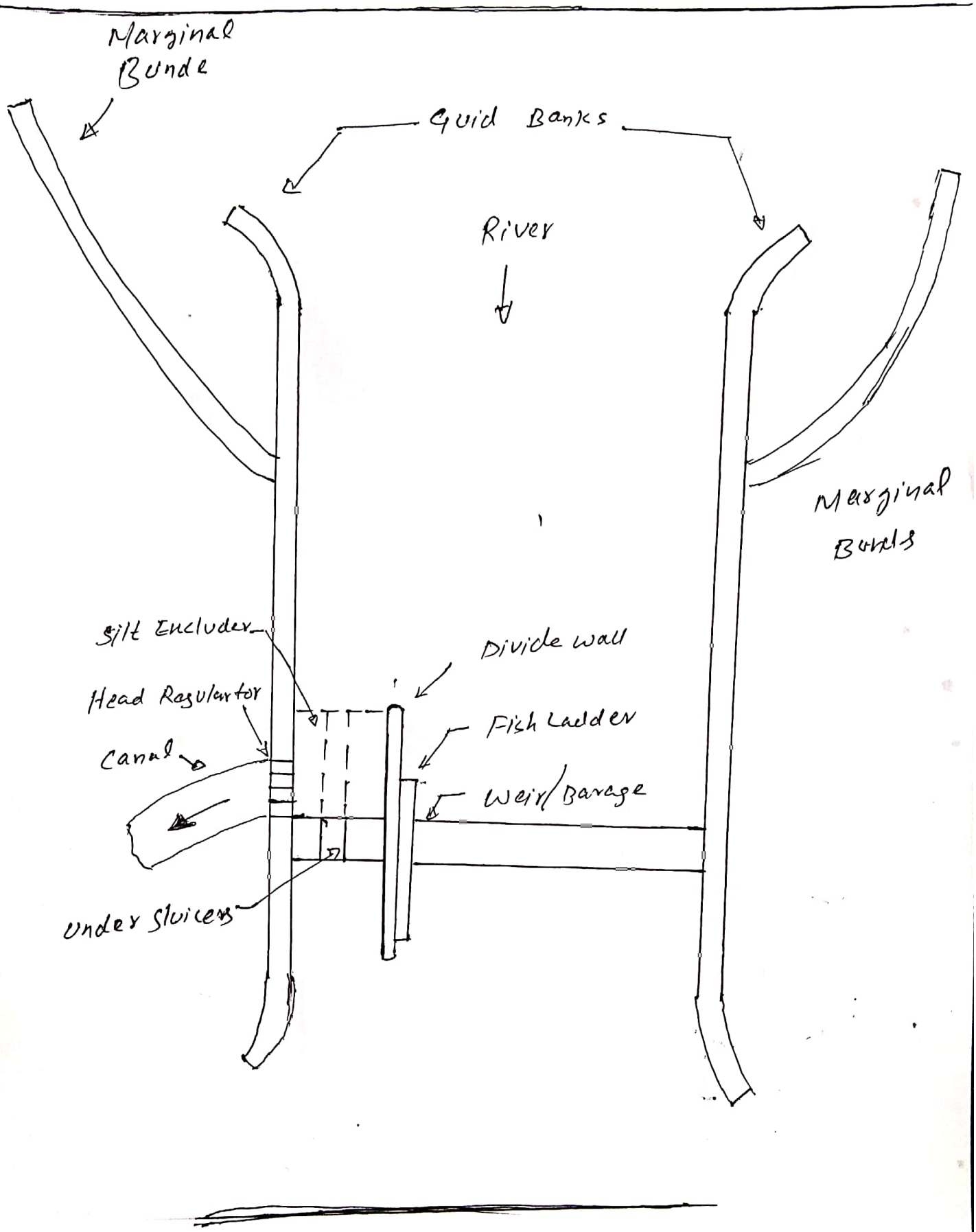
$$S = \frac{f^{(5/3)}}{3340\, Q^{1/6}}$$

$$S = \frac{(1.3)^{5/3}}{3340\,(30)^{1/6}}$$

$$\boxed{S = 0.00026}$$

Q NO: 04

Part (A)



Q.No. 04

Part - B Functions of Head regulators:

1- It regulates the Supply of water entering the canal.

2- It controls the entry of silt in the Canal.

3- It prevents the river-floods from entering the Canal.

4. To admit water into the off taking Canal.

5. To indicate the discharge passed into the canal from design discharge formula and observed head of water on the crest.

The End of paper.