Attempt all questions

Note: Assume a suitable value if you need to solve any problem.

Q.1] A lined rectangular canal 50 m wide, carries 300 cumecs . If the energy dissipated in the hydraulic jump occurring in the canal when the gate is opened equal 8.696 kg.m/kg. Design U.S.B.R. stilling basin of the canal with sketch. (15%)

Q.2] A horizontal length of a concrete floor is 15m, a cutoff is attached at its down stream end with depth 3m , the head on the structure is 4m. Find the thickness of the floor using Khosla's method and draw the uplift pressure diagram. Check the safety of the structure in soil of the south of Iraq.? (15%)

Q.3] Design the stiffeners of sliding gate in (inch) of the cross regulator which has two opening , the water way of the regulator is 5m and the upstream depth 3.65m, using five division with fs= 20000psi .   (15%)

Q.4] An inverted siphon was used to pass a discharge of canal under the main road with 0.2m head loss. The inner dimensions of this siphon are (1.5X1.5)m, safety screen used at entry and exit. The elbows of 22.5 degree were used in this siphon. Find the discharge of the canal . given the following site dimensions.
Manning n of the siphon= 0.013 , cross section area of the canal = 6.8 m^2 . k_1=0.2 , k_2=0.3 , k_{screen}= 0.2 , k_{elbow}=0.05 , length of siphon=(15+20+15)m. Sketch the structure with all details .   (20%)

Q.5] It is required to make a lined canal for steep land. The difference head between upstream and downstream reach is 2m. Design a suitable hydraulic structure of this canal to reduce the effect of the head, if the line canal carrying a normal discharge 4 cumecs and the canal section in the reaches is the same at upstream and downstream with the following data:
Depth of flow=1.2m , bed width=2m , longitudinal slope= 15cm/km, side slope 1.5:1, manning n=0.015. sketch the structure with all details.   (15%)

Q.6] Fill the blanks with <u>one ward</u> only .   (20%)

1-The barrage is an example of ----------structures.

2-If the exit gradient more than the critical gradient, the hydraulic structure failure by ----------.

3-The hydraulic structure is always safe in ----------side against uplift Pressure.

4- ----------regulator is shutting out the river floods.

5- The type of jump is -------- jump , when the Froude number =7.5.

6- -------------is called the safe valve of the dam.

7--------------is provided when water is to carry over the valley.

8-In lane's method , the structure is safe for Iraqi soil , if the hydraulic gradient less than …………… .

9-when the downstream depth is smaller than the sequent depth , the jump can control by --------------.

10- if the impact factor of the load in a box culvert is 0.37, the clear width of the culvert is ------------.

With my best wishes

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