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Section :- C.

Q.NO:-1.

Part:- a.

Answer:-

The reservior can be defined as "A reservior is a man-made lake or Large freshwater body of water. In which we can store water for the dam".

→ we have three type's of reservior following:-

① valley dammed reservior.
② Bank side reservior.
③ Service reservior.

The most ecnomical reservior is the Service reservior because it can take Less time to built from the other two reservior's. It can be built by man-made no machinery work is required in it. It can be built in a very Less Construction material's. Service reservior are generally built with at Least two compartment's so that one can be drained for maintenance without putting

the whole reservior out of service. There is an ecnomic depth for any service reservior of a given storage capacity.

Part:-b.

Answer:-

There are the two types of a embankment dam's. The one is earth fill embankment and the other one is rock fill embankment. In the earth fill embankment consist of 50% or more then this of [redacted] will be soil. In the rock fill embankment consist of 50% or more then this of rock's will be found. So we can select the rock fill embankment in the hilly area because the rock is more harder from the soil and it can bear or resist any type of force on it. We are constructing a dam in a hilly area's for this it can easily be available in this area. Due to rock availabilty there will no problem's come's at a time of Construction. It is more strength from the soil. That's why we use rock fill embankment. It can built with a very Less Cost.

Q.NO:-2.

Answer:-

The different type of Spillway's are:-

① Straight drop spillway.
② Chute spillway/open Channel spillway.
③ Ogee spill way / over flow spillway.
④ Shaft spillway/Bell mout spillway.
⑤ Siphon spillway.
⑥ Side channel.
⑦ Labyrinth spillway.

→ Recommended type of Spillway in snowbound or freezing temp is a bell mout spillway is to designed like a inverted bell where water can entire perimeter. These uncontrolled spillway's are also called morning glory, (after the flower) or glory hole spillways. In the area's where the surface of the reservior may freeze, this type of spillway is normally fitted with ice-breaking arrangement's to prevent the spillway from becoming ice-bound. In some Cases, bell mout spillways are gate Controlled. They also help to prevent damages to the main dam.

→ Below are the major component's of the bell mouth type spillway :-

① Crest.

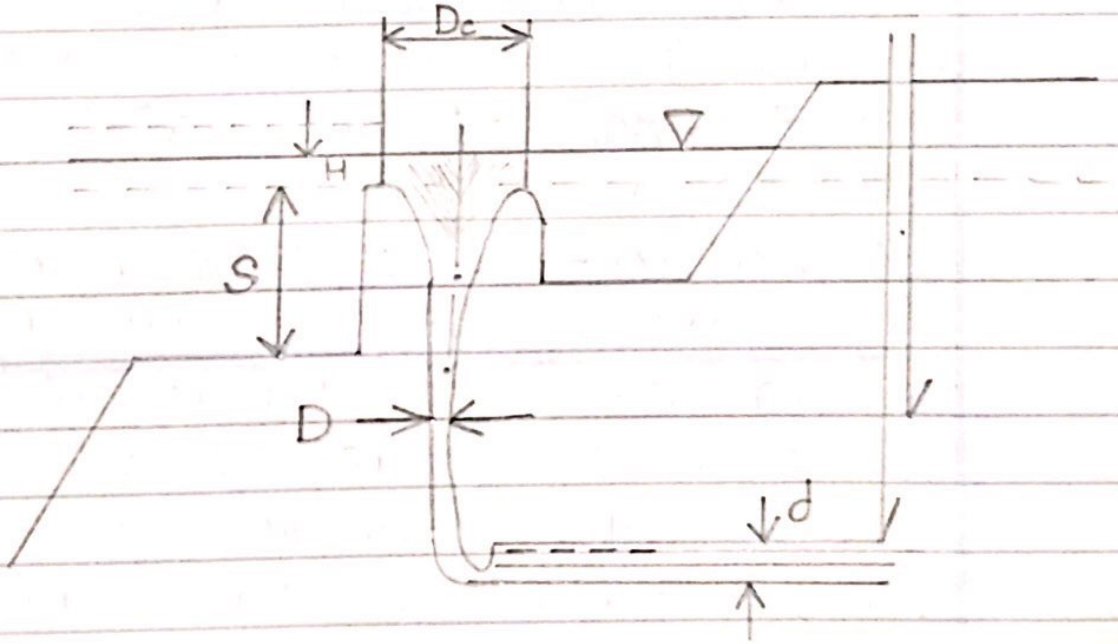
② Mechanical gate/ overflow piers.

③ Transition tube.

④ Vertical Shaft.

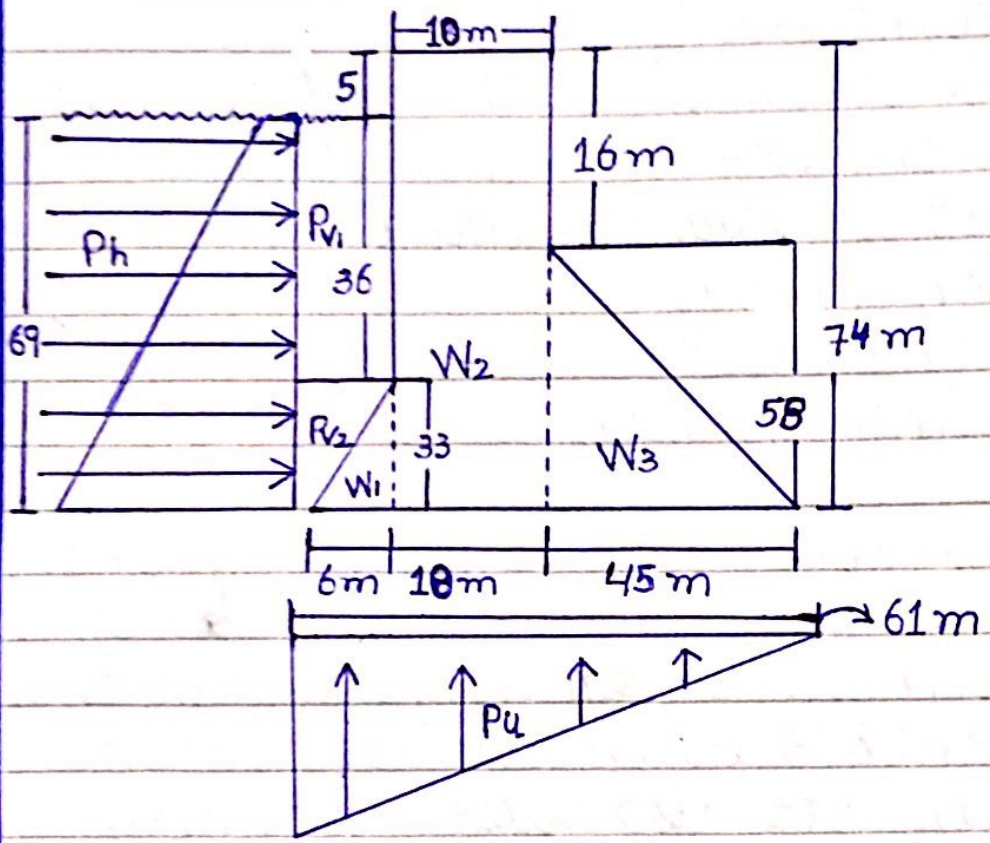
⑤ Circular bottom bend.

⑥ Tunnel / conduit.



Q.NO :-3.

Answer :-



Assume unit weight for Concrete = 24 KN/m³.
Assume unit weight for water = 10 KN/m³.

Force & Moment calculation

Force	Force formula	FY	Fx	Lever Arm	MY	Mo
W1	1/2 x L x W x Yd	2376	0	57.00	135432.0	0
W2	L x W x Yd	17760	0	50.00	888000.0	0
W3	1/2 x L x W x Yd	31320	0	30.00	939600.0	0
Pv1	1/2 x L x W x Yw	990	0	59.00	58410	0

P_{V2}	$L \times W \times \gamma_w$	2160	0	58·00	58410	0
P_U	$(-(1/2) \times L \times W \times \gamma_w)$	-21045	0	40·67	0	855830
P_h	$(-(1/2) \times L \times W \times \gamma_w)$	0	-23805	23·00	0	547510
	Σ	33561	-23805	Σ	2146722·0	1403345

→ For factor of Safety against tension condition :-

$$e < \frac{B}{6}$$

$$\frac{B}{6} = 10 \cdot 17 \text{ m}$$

→ Ecentricity of the resultant force :-

$$e = \left(\frac{B}{2}\right) - \bar{x}$$

$\bar{x}$ = Location of resultant force from toe.

$$\bar{x} = \frac{(\Sigma M_r - \Sigma M_o)}{\Sigma F_v}$$

$$\bar{x} = \frac{(2146722 \cdot 0 - 1403345)}{33561}$$

$$\bar{x} = 22 \cdot 15$$

So,

$$e = 8 \cdot 35 \text{ m}$$

Condition → Safe in tension (OK).

→ For factor of saftey aganist stress :-

Condition → $\gamma_{heel} > 0$

$\gamma_{toe} = (\Sigma F_v / B)(1 \pm (6e/B))$

$\gamma_{toe} = 1002.0484\ KN/m^3$

$\gamma_{heel} = ((\Sigma f_v / B)(1 - (6e/B))$

$\gamma_{heel} = 98.31\ KN/m^3$

Condition → Safe in stress (OK).

→ For factor of saftey aganist overturning :-

Condition → $(\Sigma M_r / \Sigma M_o) > 2$

$\gamma = (\Sigma M_r / \Sigma M_o)$

$\gamma = \frac{2146722.0}{1403345}$

$\gamma = 1.53$

Condition → not safe overturning (not ok)

$(\Sigma M_r > \Sigma M_o)$

$\Sigma M_r = 2146722.0$

$\Sigma M_o = 1403345$

Condition → Safe (ok).

→ For factor of safety against sliding :-

Condition → $((\mu \Sigma F_v + Bq)/\Sigma F_H) > 1$

$q = 1400$

$\mu = 0.7$ (0.65 to 0.75)

$(\mu \Sigma F_v + Bq)/\Sigma F_H) = 4.57$

Condition → Safe in sliding (ok).