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Question no "1" Part (A)

Answer

Reservoirs:-

A natural or artificial place where water is collected and stored for use especially water of supplying a community, irrigating lands, furnishing power, etc

A receptacle or ^{OR} chamber for holding or fluid.

Economical Reservoir:-

Service reservoir is the most economical because it is entirely man made its frame construction is easy as no need of any natural water body diversion It also requires small space.

Question No "1" Part (B)

Answer

These are two types of embankments

Earth - fill embankment

Rock - fill embankment.

The most suitable embankment for hilly area is **Rock-fill embankment** because of the following reasons:

It contains about 50% or more rock-fill material of the total volume of constituents thus can be easily available in hilly areas and are economical because of minimizing of transport charges.

Similarly it is constructed on hard rock type foundation which can be easily available in hilly areas as well as rock forms best foundation material which are free from faults, seams of soft shales or clay etc.

Question No "2"

Types of Spillways

Different types of spillways are as follows:

1. Straight Drop spillways
2. Ogee spillway
3. chute spillway
4. side channel spillway
5. siphon spillway
6. labyrinth spillway
7. shaft spillway

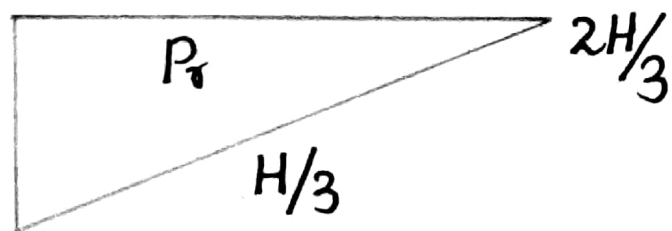
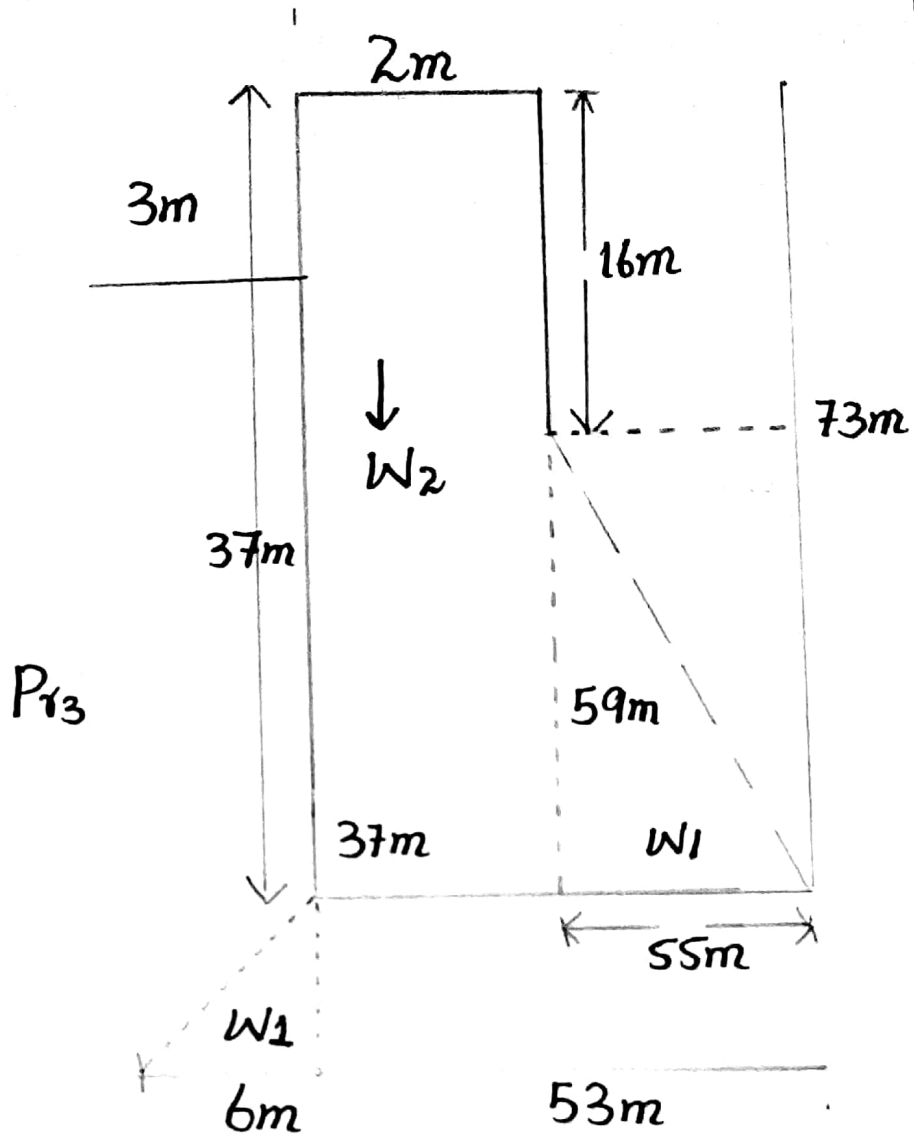
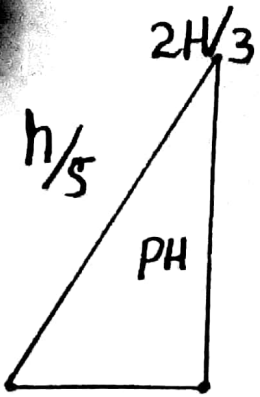
⇒ Selection of spillway for the given condition (in question).

In the condition where the temp decrease 10-10 degree in winter season.

The most efficient spillway is chute spillway. Because chute spillway dispose water from upstream through a steep sloped open channel so that flow velocity will be very high which leads to the supper

very high which lead to the super
critical flow condition

Due to high kinetic energy of water
result in increase of Temp this
the water will not freeze and flow
will remain continuous



condition:-

$$\Rightarrow e_x \quad 8/6$$

$$e_c \quad 69/6$$

$$7.16 < 11.5 \quad \text{ok safe}$$

$\Rightarrow \delta_{\text{heel}} 70$

$$\delta = \frac{\Sigma F_v}{B} \left(1 + \frac{6e}{B} \right)$$

$$\delta = \frac{\Sigma F_v}{B} \left(1 + \frac{6e}{B} \right) = \frac{3439}{69} \left(1 + \frac{6(7.16)}{69} \right)$$

$$\delta = 60.7 \text{ h KN/m}^2$$

$$\delta_{\text{heel}} = \frac{\Sigma F_v}{B} \left(1 - \frac{6e}{B} \right) = \frac{343}{69} \left(1 + \frac{6(7.16)}{69} \right)$$

$$\delta_{\text{heel}} = 128.16 \text{ KN/m}^2$$

$\delta_{\text{heel}} > 0$ ok safe

$$\frac{\Sigma m_b}{\Sigma m_s} > 2$$

$$= \frac{2622 \cdot 163.8}{16817500}$$

not safe.

$$\Rightarrow E_{mm} > EM:$$

$$2622163 \cdot B7 \quad 168 \cdot 1750 \cdot 0$$

ok
safe

$$\Rightarrow \frac{U \cdot Efv + B \cdot v}{Efa} > 1$$

$$\frac{9 \cdot 75 \times 34392169 \times 1400}{24,500}$$

$$4.99 > 1 \quad \text{ok safe}$$