NAME : HAMAD

Reg No : 7747

SECTION : "B"

SUBJECT : HYDRULLIC ENGR

DEPT : Civil ENGR

SEMESTER : 8th

EXAM : Mid TERM

INSTRUCTOR : Engr : Adeed

QUESTION NO : 1
ANSWER

Reserviors-

The word reservior refer to a place where large amounts of water get stored. It can also be used to describe great amount of other things such as when you refer to a trivia expert as a reservior of use less knowledge.

Type of Reserviour :-

⇒ Service Reserviour :-

Service reservior are more economical than are others.

The reason are explained below.

* Service reseruiour perfom several function including ensuring sufficient head of water in the distribution system of water.

* Service reservior provide water capacity to even out of peak demand from consumers.

* Service reservior also reduce the cost of pumping b/w service reservior constructed at high location / elevation.

Part "B"

ANSWER :- I will suggest rock fill embankment dam are for hilly area because..

Rock fill embankment dam is constructed from impervious material such as masonary, concrete, Asphatic concrete, sheet of steel, piles timber and other material and transition layer. Because the impervious membrane is employed as the water-proof and can be placed either or on the upstream slope.

In hilly area the chances of rain is maximum because of high altitude so if we construct earth fill embankment dam the capacity of intensity of rain ~~fall~~ will damage its down of earth fill

dam so because of this reason I will suggest to construct rock fill dam in hilly area.

QUESTION NO : 2
ANSWER

Types of Spillways :-

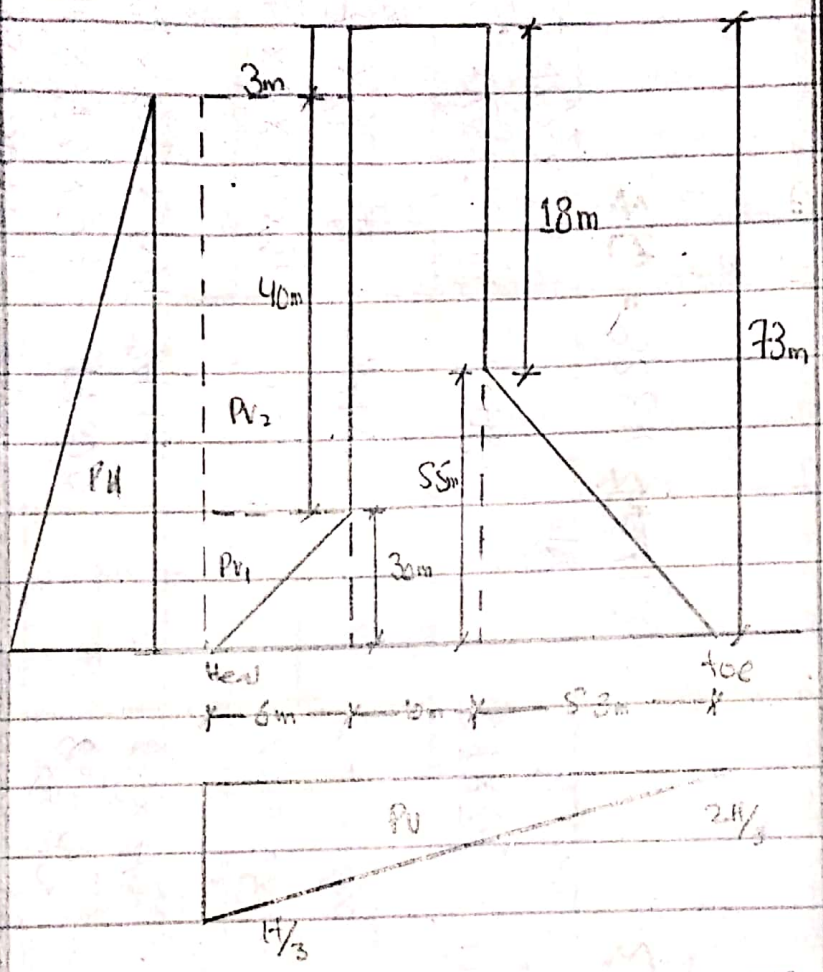
1) Straight drop spillway.
2) Ogee Spillway
3) Shaft spillway
4) Chute spillway
5) Side channel spillway
6) Siphon spillway
7) Labyrinth spillway

In a condition where freezing point of water is less than -10 degeree centigrade in winters the most efficient spillway is chute spillway. Because

chute spillway disposed water from upstream to the downstream through a steely sloped open channel so that the flow will be very fast, the flowing water pressure will be high and will be in supercritical condition. That will dissipate are also provided in this types of spillway thus the temperature of water will go high and it will not allow water from to freeze and stop, so the water will move freely in this types of spillway as the water flow from steepy channel so that the kinetic energy will take place and increase the temperature of water.

QUESTION NO : 3
ANSWER

Problem :-



Assumption :-

Unit weight of concrete = ~~28~~
= 28 kN/m²

Unit weight of water
= 13 kN/m²

q = 1400

Forces	Forces Calculation	Fv	F_H	Liver Arm	Mr	M_O
				$63 + 6/3 = 65$		
W_1	$1/2 \times 6 \times 30 \times 28$	2520		$53 + 10/2 = 49$	163800	
W_2	$10 \times 73 \times 28$	20440		$53 \times 2/3 = 35.33$	1001560	
W_3	$1/2 \times 53 \times 55 \times 28$	40810			1441817.3	
P_{V_1}	$1/2 \times 6 \times 30 \times 13$	1170		$63 + \frac{2 \times 6}{3} = 252$	294840	
P_{V_2}	$6 \times 40 \times 13$	3120		$63 + 6/2 = 66$	205920	
P_H	$-1/2 \times 69 \times 70 \times 13$	-31395		$69 \times 2/3 = 46$		1444170
P_H	$-\frac{70^2}{2} \times 10$		-24500	$70 \times 1/3 = 23.33$		571585

ΣF_v: 36665 ΣF_H: 24800 ΣM_r: 3107937.3 ΣM_O: 2015755

Ecentricity of the resultant forces :-

$$e = \frac{B}{2} - \bar{x}$$

$\bar{x}$:- Location of resultant forces from toe.

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

$$\bar{x} = \frac{31079373 - 2015755}{366655}$$

$$\boxed{\bar{x} = 29.79m}$$

Put $\bar{x} = 29.79$ in eq

$$e = \frac{B}{2} - \bar{x}$$

$$e = \frac{69}{2} - 29.79$$

$$\boxed{e = 4.71m}$$

Condition :-

Factor of Safety Against Tension

$$e < B/6$$

$4.71 < 11.5$ ok!

Factor of Safety Against Stress

$$\gamma_{Heel} > 0$$

$$\gamma = \frac{\sum F_v}{B}\left(1 \pm \frac{6(e)}{B}\right)$$

$$\gamma_{Heel} = \frac{3665}{69}\left(1 - \frac{6(4.71)}{69}\right)$$

γ_{Heel} $313.74 > 0$ ok!

$$\gamma_{toe} = \frac{3665}{69}\left(1 + \frac{6(4.71)}{69}\right)$$

$\gamma_{toe} = 749.01$

Factor of Safety Against Overturning

$$\frac{\Sigma M_r}{\Sigma M_o} > 2$$

$$\frac{3107937.3}{201575} = 1.54$$

$1.54 < 2$ not ok!

Factor of Safety Against Sliding

$$\frac{\mu \Sigma fv + B \times q}{\Sigma F_H} > 1$$

$$\frac{0.7 \times 3666 + 69 \times 1400}{2400}$$

$4.99 > 1$ ok!

$\Sigma M_r > \Sigma M_o$

$3107937.3 > 201575$