

**IQRA NATIONAL
UNIVERSITY,
PESHAWAR**

***MID TERM
EXAMINATION***

ID : 7735

SECTION : A

MODULE : 8th SEMESTER

(ϕ_1)

(A)

Reservoir: A reservoir is a man-made lake or large freshwater or body of water.

Many people think of a reservoir as a lake and might even use the word interchangeably.

However the key difference is that reservoirs are artificial and lakes are naturally.

Mainly three types of reservoir

⇒ Valley Domed Reservoir

⇒ Bank-side Reservoir

⇒ Service Reservoir

In the above three type, Service reservoir is most economical because it is entirely man-made.

(Φ_1)
(B)

Embankment Dam Suggestion:

✓ There are two types of embankment dam :

⇒ Earth fill Embankment

⇒ Rock fill Embankment

Earthfill Embankment are the one which consist of 50% or more soil while rock fill embankment are which consist of 50% or more rock.

✓ We should build rock fill embankment -

Why:

Because rock fill embankment have more strength than earth fill embankment and in hilly area rock will be easily available which will make our project economical and safe -

(Φ_2)

Different Type Of Spillways:

- ① Strength Drop Spillway
- ② Ogee Spillway
- ③ Shaft Spillway
- ④ chute spillway
- ⑤ Side channel spillway
- ⑥ Siphon Spillway
- ⑦ Labrinth Spillway

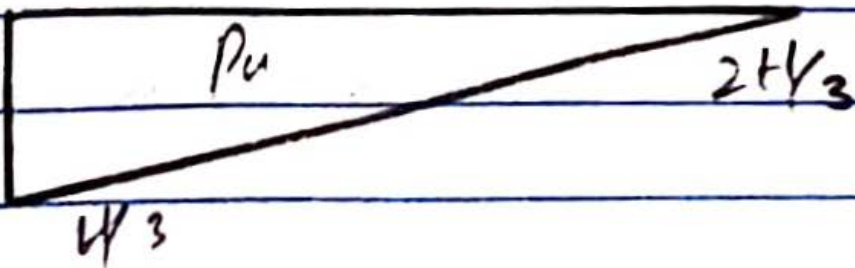
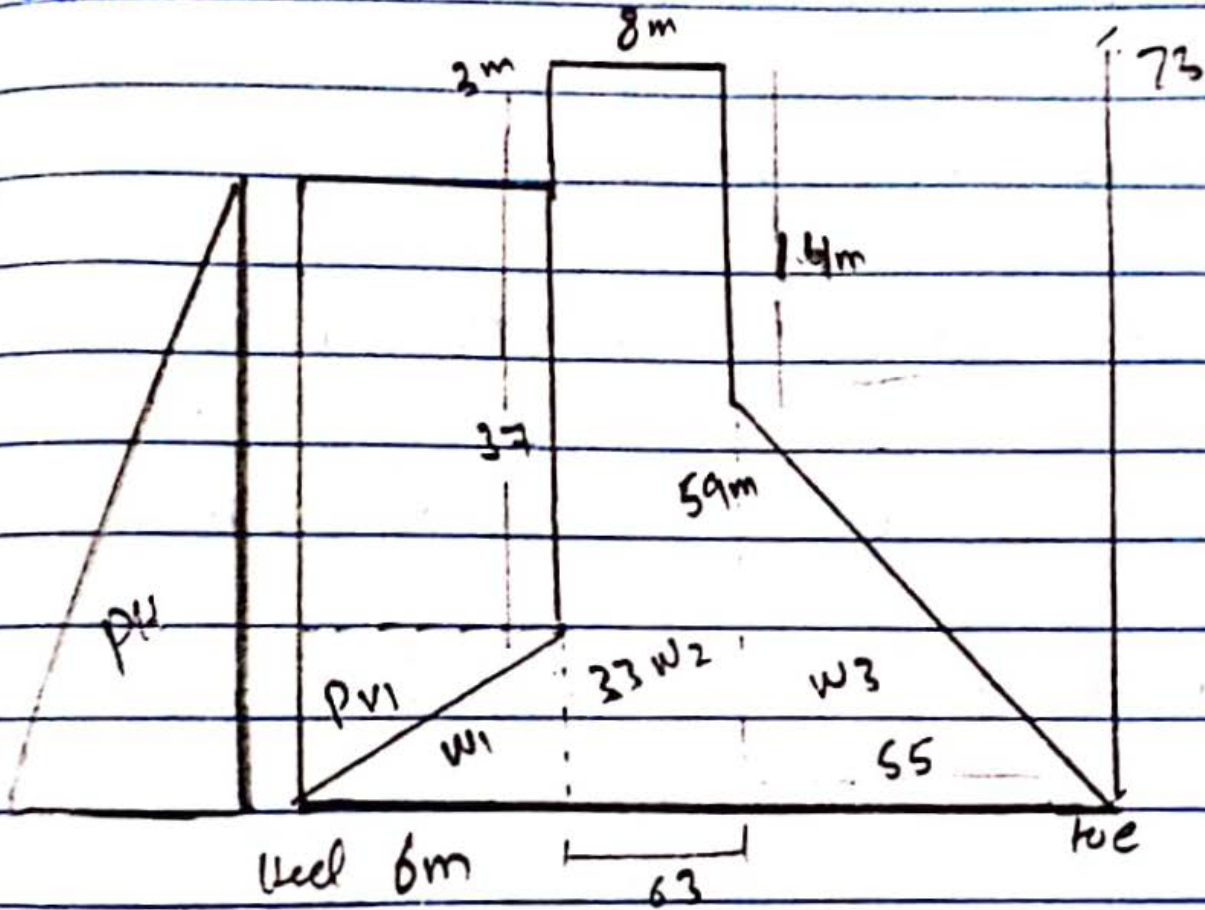
* Ogee spillway is generally more efficient in a condition where freezing point of water is less than 10-degree centigrade because the downstream surface of the spillway is coincide with the shape of the lower nappe of the free falling jet from the shaft crested weir. In this shape of the lower nippe

is similar to a projectile and hence downstream surface of the ogee spillway will follow parabolic path where "O" is the origin

of parabola -

⇒ Ogee Spillway is also best for this condition. because in this temperature the head is minimum and when spillway runs with maximum head, the overflowing water just follow the curve profile of the spillway and there is no gap between the water spillway and there is no gap between the water spillway surface discharge is maximum -

Q110 3



Forced and moment Calculation

Q.No 3

Forces	Force formula	F _y	F _x	Levd A _{rim} (m)	M _x	M _o
W ₁	$\frac{1}{2} \times 6 \times 33 \times 24$	2376		$63 + \frac{6}{3} = 65$	15440	
W ₂	$8 \times 73 \times 24$	14016		$55 + \frac{8}{2} = 59$	826944	
W ₃	$\frac{1}{2} \times 55 \times 59 \times 21$	38940		$55 \times \frac{2}{3} = 36.67$	14279298	
P _{v1}	$\frac{1}{2} \times 6 \times 33 \times 10$	990		$63 + \frac{2 \times 6}{3} = 67$	66330	
P _{v2}	$6 \times 37 \times 10$	2220		$63 + \frac{6}{2} = 66$	146520	
P _u	$-\frac{1}{2} \times 69 \times 70 \times 10$	-24150		$69 \times \frac{2}{3} = 46$		1110900
P _H	$-\frac{70^2}{2} \times 10$		-24500	$70 \times \frac{1}{3} = 23.3$		570850

ΣF_H =

ΣM_x =

ΣF_v = 34392

24500

2622163.8

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

$$\bar{x} = \frac{2622163.8 - 1681750.0}{34392}$$

$$\bar{x} = 27.34 \text{ m}$$

$$e = \frac{69}{2} - 27.34$$

$$e = 7.16 \text{ m}$$

Condition:

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

$$e < \frac{69}{6}$$

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

$$\gamma_{\text{need}} > 0$$

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

$$\gamma_{\text{to } e} = \frac{\sum F_v}{B} \left(1 + \frac{6e}{B} \right)$$

$$= \frac{34392}{69} \left(\frac{1 + 6(7.16)}{69} \right)$$

$$\gamma_{\text{to } e} = 808.76 \text{ kN/m}^2$$

$$\gamma_{\text{bes } e} = \frac{\sum F_v}{B} \left(1 - \frac{6e}{B} \right)$$

$$= \frac{34392}{69} \left(\frac{1 - 6(7.16)}{69} \right)$$

$$\gamma_{\text{need}} = 188.10 \text{ kN/m}^2$$

$$\gamma_{\text{need}} > 0 \quad \text{ok}$$

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

$$\Sigma M_o$$

$$= \frac{2622163.8}{1681750.0}$$

$$= 1.56 \neq 2 \quad \text{Not safe}$$

$$\Sigma M_r > \Sigma M_o$$

$$2622163.8 > 1681750.0 \quad \text{safe}$$

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

$$\frac{0.75 \times 34392 + 69 \times 1400}{29500}$$

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

THE END