SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR (AUTONOMOUS)

 $Siddharth\ Nagar,\ Narayanavanam\ Road-517583$

QUESTION BANK (DESCRIPTIVE)

Subject with Code: Design and Drawing of Irrigation Structures (18CE145)

Course & Branch: B.Tech & CE Year & Sem: IV-B.Tech & I-Sem

ear & Sem: IV-B.Tech & I-Sem Regulation: R18

<u>UNIT-I</u> <u>DESIGN AND DRAWING OF SLOPING GLACIS WEIR</u>

1	Design a sloping glacis weir with	[L4][CO1]	[60M]		
	Full supply discharge Bed width Bed level F.S.D. (Full Supply Depth) F.S.L. Top of Bank Level Hard soil is available for foun Draw the following: a) Plan b) Sectional Elevation	: + 11.50 : + 12.50	6.0 m + 8.00 1.5 m + 9.50 + 10.50		
2	Pull supply discharge Bed width Bed level F.S.D. (Full Supply Depth) F.S.L. Top of Bank Level Hard soil is available for foun Draw the following: a) Plan b) Sectional Elevation	U/S : 7.0 cumed : 6.0 m : + 12.00 : 1.5 m : + 13.50 : + 14.50	D/S 7.0 cumecs 6.0 m + 10.00 1.5 m + 11.50 + 12.50	[L4][CO1]	[60M]
3	Design the sloping glacis weir acr Hydraulic particulars Full supply discharge Bed width Bed level Full supply depth F.S.L Top of bank level(T.B.L) Hard strata is available below + 1' Draw the plan and sectional eleva	Up-stream of drop 9.0 m ³ /sec 6.5 m + 19.00 1.60 m + 20.60 + 21.60 7.00 level for four	Downstream of drop 9.0 m³/sec 6.5 m + 17.00 1.60 m + 18.60 + 19.60 addition.	[L4][CO1]	[60M]

4	Design the sloping glacis weir ac	[L4][CO1]	[60M]		
	Hydraulic particulars	Up-stream of drop	Downstream of drop		
	Full supply discharge	$7.5 \text{ m}^3/\text{sec}$	$7.5 \text{ m}^3/\text{sec}$		
	Bed width	6.0 m	6.0 m		
	Bed level	+ 10.00	+ 8.00		
	Full supply depth	1.50 m	1.50 m		
	F.S.L	+ 11.50	+ 9.50		
	Top of bank level(T.B.L)	+ 12.50	+ 10.50		
	Hard strata is available below + 8				
	Draw the plan and sectional eleva				
5	Design the sloping glacis weir act		_	[L4][CO1]	[60M]
		$\frac{\text{U/S}}{\text{O}}$	$\underline{D/S}$		
	Full supply discharge	: 8.0 cumec			
	Bed width	: 6.0 m	6.0 m		
	Bed level	: +12.00			
	F.S.D. (Full Supply Depth)	: 1.5 m			
	F.S.L.	: +13.50			
	Top of Bank Level	: + 14.50			
	Hard soil is available for four	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	0.00 level		
	<u>Draw the following</u> :				
	a) Plan				
	b) Sectional Elevation				

<u>UNIT-II</u> <u>DESIGN AND DRAWING OF SURPLUS WEIR</u>

Course Code: 18CE145

1	Design a surplus weir for a minor took	forming a group of tanks with the	[L4][CO1]	[60M]
1	Design a surplus weir for a minor tank following data:	forming a group of tanks with the		[UUIVI]
	Combined catchment area	$= 25.89 \text{ km}^2$		
	Intercepted catchment area	$= 20.71 \text{ km}^2$		
	Top width of the bund	= 20.71 km $= 2 m$		
	Side slopes of the bund	= 2:1 on both sides		
	Top level of bund	= +14.50		
	Maximum Water Level (MWL)	= +12.75		
	Full Tank Level (FTL)	= +12.00		
	General ground level at the site	= +11.00		
	Ground level slopes off to a level	= + 10.00 in about 6 m distance		
	The foundations are of hand gravel			
	Saturation gradient	= 4:1 with 1 m clean cover		
	Provision is to be made to store water	up to MWL in-times of necessity		
	Draw the following: (a) Helf plan at top and helf plan at for	undation loval		
	(a) Half plan at top and half plan at for (b) Half longitudinal section and half le			
2	(b) Half longitudinal section and ha		[L4][CO1]	[60M]
_	following data:	Torning a group or tanks with the	լեեյլան	[OOM]
	Combined catchment area	$= 35 \text{ km}^2$		
	Intercepted catchment area	$= 10 \text{ km}^2$		
	Top width of the bund	= 2 m		
	Side slopes of the bund	= 2:1 on both sides		
	Top level of bund	= 2.1 on both sides = $+ 12.25$		
	Maximum Water Level (MWL)			
	Full Tank Level (FTL)	= +10.73 = $+10.00$		
	, , ,			
	General ground level at the site	= +8.50		
	Ground level slopes off to a level	= +8.00 in about 6 m distance		
	The foundations are of hand gravel	= +7.00		
	Saturation gradient	= 4:1 with 1 m clean cover		
	Provision is to be made to store water	up to MWL in-times of necessity		
	Draw the following:			
	(a) Half plan at top and half plan at for	undation level		
	(b) Half longitudinal section and half l			
3	Design the surplus work of a tank form	ning part of a chain of tanks. The	[L4][CO1]	[60M]
	combined catchment area of the group	o of tanks is 25.89 sq. kilometers		
	and the area of the catchment intercept	ted by the upper tanks is 20.71 sq.		
	kilometers.	•		
	It is decided to store water in the	tank to a level of +11.00 meters		
	above M.S.L. (Mean Sea Level) limit			
	lands up to a level of +11.75 meters a	_		
	level at the proposed site of work is +1			
	below the proposed surplus slopes of	_		
	about 6 meters distance.	i iii it reaches +07.00 meters m		
	about b inclus distance.			

	The tank bund has a top width of			
	side slopes on eitherside. The tank by			
	gradient of 4:1 with 1 meter clear co	•		
	make kutcha regulating arrangement	——————————————————————————————————————		
	times of necessity.			
	The foundations are of hard gravel at			
	of work. Also draw the plan and longi			
4	Design a surplus weir for a minor tank		[L4][CO1]	[60M]
	following data:	8 1 8 1 1 man man		
	Combined catchment area	$= 25.89 \text{ km}^2$		
	Intercepted catchment area	$= 20.71 \text{ km}^2$		
	Top width of the bund	$= 2 \mathrm{m}$		
	Side slopes of the bund	= 2:1 on both sides		
	Top level of bund	= +14.50		
	Maximum Water Level (MWL)	= +12.75		
	Full Tank Level (FTL)	= +12.00		
	General ground level at the site Ground level slopes off to a level	= +11.00 = +10.00 in about 6 m		
	Ground level slopes off to a level	distance		
	The foundations are of hand gravel	= +9.50		
	Saturation gradient	= 4:1 with 1 m clean cover		
		MINTE CONTRACTOR		
	Provision is to be made to store water	up to MWL in-times of necessity		
	<u>Draw the following:</u> (a) Half plan at top and half plan at fo	oundation level		
	(b) Section across weir	diffication level		
5	Design a surplus weir for a minor tank	x forming a group of tanks with the	[L4][CO1]	[60M]
	following data:	a group of tames with the	[2:][001]	[001/2]
	Combined catchment area	$= 35 \text{ km}^2$		
	Intercepted catchment area	$= 10 \text{ km}^2$		
	Top width of the bund	= 2 m		
	Side slopes of the bund	= 2:1 on both sides		
	Top level of bund	= +12.25		
	Maximum Water Level (MWL)	= +12.23 = $+10.75$		
			I	1
	· · · · · · · · · · · · · · · · · · ·			
	Full Tank Level (FTL)	= +10.00		
	Full Tank Level (FTL) General ground level at the site	= +10.00 = +8.50		
	Full Tank Level (FTL)	= + 10.00 = + 8.50 = + 8.00 in about 6 m		
	Full Tank Level (FTL) General ground level at the site	= +10.00 = +8.50		
	Full Tank Level (FTL) General ground level at the site Ground level slopes off to a level	= + 10.00 = + 8.50 = + 8.00 in about 6 m distance		
	Full Tank Level (FTL) General ground level at the site Ground level slopes off to a level The foundations are of hand gravel Saturation gradient	= + 10.00 = + 8.50 = + 8.00 in about 6 m distance = + 7.00 = 4:1 with 1 m clean cover		
	Full Tank Level (FTL) General ground level at the site Ground level slopes off to a level The foundations are of hand gravel Saturation gradient Provision is to be made to store water	= + 10.00 = + 8.50 = + 8.00 in about 6 m distance = + 7.00 = 4:1 with 1 m clean cover		
	Full Tank Level (FTL) General ground level at the site Ground level slopes off to a level The foundations are of hand gravel Saturation gradient Provision is to be made to store water Draw the following:	= + 10.00 = + 8.50 = + 8.00 in about 6 m distance = + 7.00 = 4:1 with 1 m clean cover up to MWL in-times of necessity		
	Full Tank Level (FTL) General ground level at the site Ground level slopes off to a level The foundations are of hand gravel Saturation gradient Provision is to be made to store water	= + 10.00 = + 8.50 = + 8.00 in about 6 m distance = + 7.00 = 4:1 with 1 m clean cover up to MWL in-times of necessity		

<u>UNIT-III</u> <u>DESIGN AND DRAWING OF TANK SLUICE WITH A TOWER HEAD</u>

1			[L4][CO1]	[60M]
1	Design a tank sluice with tower head	for the data given below:	[L4][CO1]	[OOM]
	Ayacut to be irrigated	= 200 ha		
	Duty	= 1000 ha/cumec		
	Top width of the tank bund	= 2m with 2:1 side slopes		
	The top level of bank	= +40.00		
	The ground level at the site	= +34.50		
	Hard soil for foundation	= +33.50		
	The sill of the sluice at off take	= +34.00		
	The maximum water level in tank			
	The Full Tank Level	= + 37.00		
	Average low water level of the tank			
	The channel bed level	= +34.00		
		= +34.00 = +34.50		
	Full supply level			
	Bed width	= 1.25 m		
	Side slopes of channel	= 1.5 to 1 with top of bank at + 35.50		
	Draw the following:	. 20.00		
	(a) Half plan at top & half plan at fou	andation level		
	(b) Longitudinal section through the	barrel		
2	Design a tank sluice with tower head	for the data given below:	[L4][CO1]	[60M]
	Ayacut to be irrigated	= 200 ha		
	Duty	= 900 ha/cumec		
	Top width of the tank bund			
	The top level of bank	= +140.00		
	The ground level at the site			
	Hard soil for foundation	= +133.50		
	The sill of the sluice at off take	= +134.00		
	The maximum water level in tank			
	The Full Tank Level	= +137.00		
	Average low water level of the tank	= +135.00		
	The channel bed level	= +134.00		
	Full supply level	= +134.50		
	Bed width	= 1.25 m		
	Side slopes of channel	= 1.5 to 1 with top of bank at		
	-	+135.50		
	Draw the following:			
	(a) Half plan at top & half plan at fou			
<u> </u>	(b) Longitudinal section through the	barrel	FF 4350043	F.CO3 53
3	Design a tank sluice with tower head	for the data given below:	[L4][CO1]	[60M]
	Ayacut to be irrigated	= 400 ha		
	Duty	= 1000 ha/cumec		
	Top width of the tank bund	= 3m with 2:1 side slopes		
	The top level of bank	= +40.00		
	The ground level at the site	= +34.50		
	Hard soil for foundation	= +34.50 = $+33.50$		
	The sill of the sluice at off take	= +34.00		
	The Fall Teach Level	= +38.00		
	The Full Tank Level	= +37.00		
	Average low water level of the tank			
	The channel bed level	= +34.00		

		24.50	ı	
	11 5	= +34.50		
		= 1.25 m		
	Side slopes of channel	= 1.5 to 1 with top of bank at		
		+ 35.50		
	Draw the following:			
	(a) Half plan at top & half plan at foun	ndation level		
	(b) Longitudinal section through the ba	arrel		
4	Design a sluice taking off from a ta	nk irrigating 200 hectares at 1000	[L4][CO1]	[60M]
	ha/cumec duty. The tank bund through			
	top width of 2 meters with 2:1 side slo			
	and the ground level at site is +34.50			
	available at $+33.50$. The sill of the			
	maximum water level in tank is +38			
	Average low water level of the tank is			
	below the sluice are as under.			
	Bed level +34.00			
	F.S.L. +34.50			
	Bed width 1.25 meters			
	Side slope 1.5 to 1 with top of bank	at +35.50.		
	Also draw the plan and longitudinal se			
5			[L4][CO1]	[60M]
	Design a tank sluice with tower head f		[][]	[001.2]
	Discharge	= 0.2 cumec		
	Top width of the tank bund	= 2m with 2:1 side slopes		
	The top level of bank	= +40.00		
	The ground level at the site Hard soil for foundation	= +34.50 = +33.50		
	The sill of the sluice at off take	= +33.30 = $+34.00$		
	The maximum water level in tank	= +34.00 = $+38.00$		
	The Full Tank Level	= +36.00 = $+37.00$		
	Average low water level of the tank	= + 35.00		
	The channel bed level	= +34.00		
	Full supply level	= +34.50		
	Bed width	= 1.25 m		
	Side slopes of channel	= 1.5 to 1 with top of bank at		
	1	+ 35.50		
	Draw the following:			
	(a) Half plan at top & half plan at four	ndation level		
1	(b) Longitudinal section through the b			

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<u>UNIT -IV</u> <u>DESIGN AND DRAWING OF TYPE - III SYPHON AQUEDUCT</u>

1	Design a syphon aqueduct Type – III for the following data:			[L4][CO1]	[60M]
	Canal:		5 11 11 5 Carrell	10.10.1	
	Discharge	=	$35 \text{ m}^3/\text{s}$		
	Bed width	=	20.00 m		
	Bed Level	=	+ 40.00		
	Full supply level	=	+ 42.00		
	Ultimate Bed level		+ 39.75		
	Ultimate full supply level		+ 42.50		
	Average velocity in the canal		0.83 m/s		
	Left bank top width	=	5.00 m		
	Right bank top width	=	2.00 m		
	Canal side slopes both inside and outside	=	2:1		
	Top of canal bank	=	+ 43.50		
	<u>Drain:</u>		_		
	Catchment area		8.0 km^2		
	Maximum computed discharge	=	$60 \text{ m}^3/\text{s}$		
	Maximum flood level of the drain at the	=	+ 39.75 (observed)		
	site crossing				
	Average bed level of the drain at the site	=	+ 38.00		
	crossing				
	Hard soil is available at	=	+ 37.00		
	Draw the following:				
	a) Half plan at top and half plan at foundat	ion			
	b) Section across syphon barrel				
2	Design a syphon aqueduct Type – III for the	folle	owing data:	[L4][CO1]	[60M]
	<u>Canal</u> :		2		
	Discharge	=	$35 \text{ m}^3/\text{s}$		
	Discharge Bed width	=	20.00 m		
	Discharge Bed width Bed Level	=	20.00 m + 40.00		
	Discharge Bed width Bed Level Full supply level	= = =	20.00 m + 40.00 + 42.00		
	Discharge Bed width Bed Level Full supply level Ultimate Bed level	= = = =	20.00 m + 40.00 + 42.00 + 39.75		
	Discharge Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level	= = = =	20.00 m + 40.00 + 42.00 + 39.75 + 42.50		
	Discharge Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal	= = = =	20.00 m + 40.00 + 42.00 + 39.75		
	Discharge Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level	= = = = =	20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s		
	Discharge Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width	= = = = =	20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m		
	Discharge Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside		20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m		
	Discharge Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank		20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m		
	Discharge Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank Drain:		20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m 2:1 + 43.50		
	Discharge Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank Drain: Catchment area		20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m 2:1 + 43.50		
	Discharge Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank Drain: Catchment area Maximum computed discharge		20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m 2:1 + 43.50 8.0 km ² 60 m ³ /s		
	Discharge Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank Drain: Catchment area Maximum computed discharge Maximum flood level of the drain at the		20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m 2:1 + 43.50		
	Discharge Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank Drain: Catchment area Maximum computed discharge Maximum flood level of the drain at the site crossing		20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m 2:1 + 43.50 8.0 km ² 60 m ³ /s + 39.75 (observed)		
	Discharge Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank Drain: Catchment area Maximum computed discharge Maximum flood level of the drain at the		20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m 2:1 + 43.50 8.0 km ² 60 m ³ /s		
	Discharge Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank Drain: Catchment area Maximum computed discharge Maximum flood level of the drain at the site crossing Average bed level of the drain at the site		20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m 2:1 + 43.50 8.0 km ² 60 m ³ /s + 39.75 (observed)		
	Discharge Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank Drain: Catchment area Maximum computed discharge Maximum flood level of the drain at the site crossing Average bed level of the drain at the site crossing Hard soil is available at Draw the following:		20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m 2:1 + 43.50 8.0 km ² 60 m ³ /s + 39.75 (observed) + 38.00		
	Discharge Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank Drain: Catchment area Maximum computed discharge Maximum flood level of the drain at the site crossing Average bed level of the drain at the site crossing Hard soil is available at		20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m 2:1 + 43.50 8.0 km ² 60 m ³ /s + 39.75 (observed) + 38.00		

	Design a syphon aqueduct Type – III for the following data:				[60M]
	Canal:	7011	owing data.		
	Discharge	_	$35 \text{ m}^3/\text{s}$		
	Bed width	=	20.00 m		
	Bed Level	=	+ 40.00		
	Full supply level		+ 42.00		
	Ultimate Bed level		+ 39.75		
	Ultimate full supply level	=	+ 42.50		
	Average velocity in the canal	=	0.83 m/s		
	Left bank top width	=	5.00 m		
	Right bank top width	=	2.00 m		
	Canal side slopes both inside and outside	=	2:1		
	Top of canal bank	=	+ 43.50		
	<u>Drain:</u>				
	Catchment area	=	8.0 km^2		
	Maximum computed discharge	=	$60 \text{ m}^3/\text{s}$		
	Maximum flood level of the drain at the	=	+ 39.75 (observed)		
	site crossing Average bed level of the drain at the site	=	+ 38.00		
	crossing				
	Hard soil is available at	=	+ 37.00		
	Draw the following:				
	a) Half plan at top and half plan at foundat				
4	b) Elevation from D/S drain and section the	roug	n road arches	[] 4][CO1]	[(ON/I]
4	Design a syphon aqueduct Type – III for the	e foll	owing data:	[L4][CO1]	[60M]
	Canal:		_		
	Discharge		26 m3/a		
		=	$36 \text{ m}^3/\text{s}$		
	Bed width	=	20.00 m		
	Bed width Bed Level	= =	20.00 m + 40.00		
	Bed width Bed Level Full supply level	= = =	20.00 m + 40.00 + 42.00		
	Bed width Bed Level Full supply level Ultimate Bed level	= = = =	20.00 m + 40.00 + 42.00 + 39.75		
	Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level	= = = = =	20.00 m + 40.00 + 42.00 + 39.75 + 42.50		
	Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal	= = = =	20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s		
	Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width	= = = =	20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m		
	Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width	= = = =	20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m		
	Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside	= = = =	20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m		
	Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width	= = = =	20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m		
	Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside	= = = =	20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m		
	Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank	= = = =	20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m		
	Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank Drain:	= = = = = =	20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m 2:1 + 43.50		
	Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank Drain: Catchment area	= = = = = = = = = = = = = = = = = = = =	20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m 2:1 + 43.50		
	Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank Drain: Catchment area Maximum computed discharge Maximum flood level of the drain at the site crossing		20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m 2:1 + 43.50 8.0 km ² 60 m ³ /s + 39.75 (observed)		
	Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank Drain: Catchment area Maximum computed discharge Maximum flood level of the drain at the		20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m 2:1 + 43.50 8.0 km ² 60 m ³ /s		
	Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank Drain: Catchment area Maximum computed discharge Maximum flood level of the drain at the site crossing Average bed level of the drain at the site		20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m 2:1 + 43.50 8.0 km ² 60 m ³ /s + 39.75 (observed)		
	Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank Drain: Catchment area Maximum computed discharge Maximum flood level of the drain at the site crossing Average bed level of the drain at the site crossing Hard soil is available at Draw the following:		20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m 2:1 + 43.50 8.0 km ² 60 m ³ /s + 39.75 (observed) + 38.00		
	Bed width Bed Level Full supply level Ultimate Bed level Ultimate full supply level Average velocity in the canal Left bank top width Right bank top width Canal side slopes both inside and outside Top of canal bank Drain: Catchment area Maximum computed discharge Maximum flood level of the drain at the site crossing Average bed level of the drain at the site crossing Hard soil is available at		20.00 m + 40.00 + 42.00 + 39.75 + 42.50 0.83 m/s 5.00 m 2.00 m 2:1 + 43.50 8.0 km ² 60 m ³ /s + 39.75 (observed) + 38.00		

5	Design a syphon aqueduct Type – III for the	foll	owing data:	[L4][CO1]	[60M]
	Canal:				
	Discharge	=	$36 \text{ m}^3/\text{s}$		
	Bed width	=	20.00 m		
	Bed Level	=	+ 40.00		
	Full supply level	=	+ 42.00		
	Ultimate Bed level	=	+ 39.75		
	Ultimate full supply level		+ 42.50		
	Average velocity in the canal	=	0.83 m/s		
	Left bank top width	=	5.00 m		
	Right bank top width	=	2.00 m		
	Canal side slopes both inside and outside	=	2:1		
	Top of canal bank	=	+ 43.50		
	<u>Drain:</u>				
	Catchment area	=	8.0 km^2		
	Maximum computed discharge	=	$60 \text{ m}^3/\text{s}$		
	Maximum flood level of the drain at the	=	+ 39.75 (observed)		
	site crossing				
	Average bed level of the drain at the site	=	+ 38.00		
	crossing				
	Hard soil is available at	=	+ 37.00		
	<u>Draw the following:</u>				
	a) Half plan at top and half plan at foundation	ion			
	b) Longitudinal section along barrel				

<u>UNIT -V</u> <u>DESIGN AND DRAWING OF CANAL REGULATOR</u>

			Γ	
1	0 0	bridge with the following data:	[L4][CO1]	[60M]
	Hydraulic particulars of ca			
	Full supply discharge	$: 20 \text{ m}^3/\text{s}$		
	Bed width	: 15 m		
	Bed Level	: + 20.00		
	Full Supply Depth	: 2.0 m		
	F.S.L.	: + 22.00		
	Top level of bank	: + 23.00		
	The right bank is 5 m wide a	and left bank is 2 m wide		
	Hydraulic particulars of ca	<u>anal downstream</u> :		
	Full supply discharge	$: 16 \text{ m}^3/\text{s}$		
	Bed width	: 15 m		
	Bed Level	: + 20.00		
	Full Supply Depth	: 1.75 m		
	F.S.L.	: + 21.75		
	Top Level of Bank	: + 22.75		
	Good foundation soil is avai			
	The general ground level at	site : + 22.00		
		same as those on the upstream side. The		
	*	single lane designed for IRC loading class		
	= -	of one meter above F.S.L. for the road bridge.		
	Also draw the plan and longi	_		
2		bridge with the following data:	[L4][CO1]	[60M]
	Hydraulic particulars of ca		. 31 3	[• • • • • • •
	Full supply discharge	$: 18 \text{ m}^3/\text{s}$		
	Bed width	: 14 m		
	Bed Level	: + 15.00		
		: 2.0 m		
	F.S.L.	: + 17.00		
	Top level of bank			
	The right bank is 5 m wide a			
	Hydraulic particulars of ca			
	Full supply discharge	: 12 m ³ /s		
	Bed width	: 14 m		
	Bed Level	: + 15.00		
	Full Supply Depth	: 1.60 m		
	F.S.L.	: + 16.60		
	Top Level of Bank	: + 17.60		
	Good foundation soil is avail			
	The general ground level at s			
		same as those on the upstream side. The		
	<u> </u>	single lane designed for IRC loading class		
	•	of one meter above F.S.L. for the road bridge.		
	11 provide cicai free obaid	one meter above 1.5.L. for the road oriage.		

half plan at foundation and l Hydraulic particulars	U/S canal		D/S canal	
Full supply discharge	22 m ³ /s		16 m ³ /s	
Bed width	15 m		15 m	
Bed Level	+20.00		+20.00	
Full Supply Depth	2 m		1.75 m	
F.S.L	+22.00		+21.75	
Top level of bank	+23.00		+22.75	
regulator carries a road way 'A' provides clear free boa bridge. The right bank is 5 m wide D/S. Good foundation soil +22.00 Design a regulator cum road half plan at foundation and leaf	and left bank is a savailable at +	above F.S. 2 m wide o 19.00 m ar collowing da	L. for the road on both U/S and ground level	[60N
half plan at foundation and l Hydraulic particulars	ongitudinal section U/S of		D/S canal	
Full supply discharge	16 r	m^3/s	12 m ³ /s	
Bed width	14	m	14 m	
Bed Level	+15	5.00	+15.00	
Full Supply Depth	2	m	1.60 m	
F.S.L	+17	7.00	+16.60	
Top level of bank	+18	2.00	1 - 10	
1			+17.60	
Top width of banks are the regulator carries a road way 'A' provide clear free board. The right bank is 5 m wide D/S. Good foundation soil +17.00 Design a regulator cum road half plan at foundation and l	of one meter above and left bank is a savailable at + bridge with the foongitudinal section	on the upstr gned for IR e F.S.L. for 2 m wide o 14.00 m ar collowing da	ream side. The C loading class the road bridge. In both U/S and I ground level at a and draw	[60N
Top width of banks are the regulator carries a road way 'A' provide clear free board. The right bank is 5 m wide D/S. Good foundation soil +17.00 Design a regulator cum road half plan at foundation and l Hydraulic particulars	v single lane design of one meter above and left bank is 2 is available at + 1 bridge with the foongitudinal section U/S canal	on the upstr gned for IR e F.S.L. for 2 m wide o 14.00 m ar collowing da	ream side. The C loading class the road bridge. In both U/S and Indigended and ground level that and draw	[60N
Top width of banks are the regulator carries a road way 'A' provide clear free board. The right bank is 5 m wide D/S. Good foundation soil +17.00 Design a regulator cum road half plan at foundation and l Hydraulic particulars Full supply discharge	v single lane design of one meter above and left bank is 2 is available at + I bridge with the foongitudinal section U/S canal 21 m³/s	on the upstr gned for IR e F.S.L. for 2 m wide o 14.00 m ar collowing da	ream side. The C loading class the road bridge. In both U/S and Indigended and ground level that and draw 16 m³/s	[60N
Top width of banks are the regulator carries a road way 'A' provide clear free board. The right bank is 5 m wide D/S. Good foundation soil +17.00 Design a regulator cum road half plan at foundation and land Hydraulic particulars Full supply discharge Bed width	v single lane design of one meter above and left bank is 2 is available at + I bridge with the foongitudinal section U/S canal 21 m³/s 15 m	on the upstr gned for IR e F.S.L. for 2 m wide o 14.00 m ar collowing da	ream side. The C loading class the road bridge. In both U/S and Indigended and ground level Inta and draw 16 m ³ /s 15 m	[60N
Top width of banks are the regulator carries a road way 'A' provide clear free board. The right bank is 5 m wide D/S. Good foundation soil +17.00 Design a regulator cum road half plan at foundation and late of the Hydraulic particulars. Full supply discharge. Bed width. Bed Level.	v single lane design of one meter above and left bank is 2 is available at + I bridge with the foongitudinal section U/S canal 21 m³/s	on the upstr gned for IR e F.S.L. for 2 m wide o 14.00 m ar collowing da	ream side. The C loading class the road bridge. In both U/S and Indigended and ground level that and draw 16 m³/s	[60N
Top width of banks are the regulator carries a road way 'A' provide clear free board. The right bank is 5 m wide D/S. Good foundation soil +17.00 Design a regulator cum road half plan at foundation and land Hydraulic particulars Full supply discharge Bed width	v single lane design of one meter above and left bank is 2 is available at + bridge with the foongitudinal section U/S canal 21 m³/s 15 m +20.00	on the upstr gned for IR e F.S.L. for 2 m wide o 14.00 m ar collowing da	ream side. The C loading class the road bridge. In both U/S and Indigended and ground level Inta and draw D/S canal 16 m³/s 15 m +20.00	[60N

'A' provides clear free board of one meter above F.S.L. for the road	
bridge.	
The right bank is 5 m wide and left bank is 2 m wide on both U/S and	
D/S. Good foundation soil is available at + 19.00 m and ground level	
+22.00	

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