Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (OLD) - EXAMINATION – SUMMER 2017

Subject Code:180601 **Date:04/05/2017**

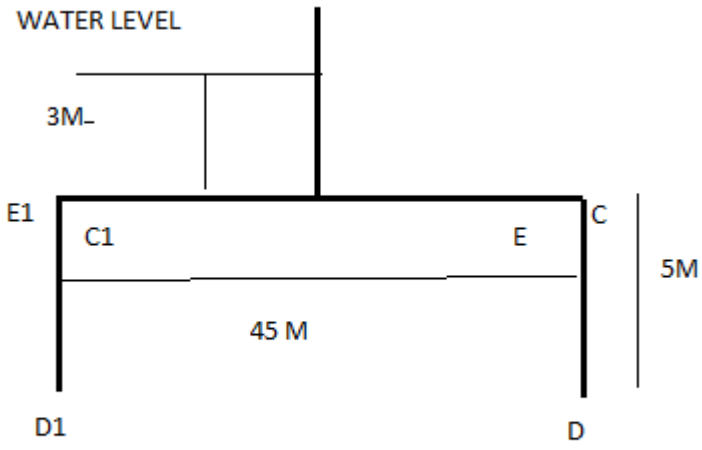
Subject Name: Design of Hydraulic Structures

Time:10:30 AM to 01:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Enlist different forces acting on gravity dam and explain (i) Uplift pressure and (ii) Earthquake pressure	**07**
	(b)	Explain method of drawing phreatic line when filter is provided at toe.	**07**
Q.2	**(a)**	Explain factor affecting selection of dam site	**07**
	(b)	Calculate downstream profile of a ogee spillway with Q=6500 cumec, Average bed level of river 50.00 m , Head of crest = 152.00 m , spillway length 5 spans each of 11m, thickness of pillar =2m, kp=0.01, ka=0.1, Assume any other data needed	**07**
		OR	
	(b)	Explain sweedish sleep circle method for analysis of stability of earthen dam slope .	**07**
Q.3	**(a)**	For a Gravity Dam , Given ΣM+=329800 t.m, ΣM - = 239400 t.m, , Σv=5300 , ΣH=4900 t, μ=0.7 , B=75 m , q=140 t/m^2. Calculate normal stress at heel and toe, Also calculate Factor of safety against overturning, Factor of safety against sliding, and Sheat Friction Factor	**07**
	(b)	Explain design criteria for sarda type of fall when Q> 14 cumec	**07**
		OR	
Q.3	**(a)**	Explain Bucket type energy dissipator	**07**
	(b)	Give classification of different type of earthen dam .	**07**
Q.4	**(a)**	Explain Bligh's creep theory .	**07**
	(b)	Explain cross regulator and Head regulator in canal network .	**07**
		OR	
Q.4	**(a)**	Describe khosla's method of independent variable	**07**
	(b)	Explain glacis type of fall .	**07**
Q.5	**(a)**	Explain Factor of safety against overturning (ii) Factor of safety agains sliding (iii) S. F. F.	**07**
	(b)	Explain different type of load combination of gravity dam for analysis also discuss elementary profile of gravity dam .	**07**
		OR	
Q.5	**(a)**	Work out pressure at φ_{E1}, , φ_{D1}, φ_{C1}, φ_{E}, φ_{D}, φ_{C} For the two pile 5 m depth at upstream and downstream of a floor of 45 m . and head of water 3 m	**07**



PROFILE OF FLOOR AND PILE OF A WEIR

(b) Explain construction method of earthen dam **07**

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