Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII • EXAMINATION – SUMMER 2014

Subject Code: 180601 **Date: 05-06-2014**

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)**	Define with neat sketch: Dam, Spillway, Energy dissipater, Axis of gravity dam, Hydraulic height of dam, Structural height of dam, Length of dam	**07**
	(b)	Briefly discuss the factors affecting the selection of site for a dam.	**07**
Q.2	**(a)**	Design ONLY a practical section for a gravity dam when the following data are available. HFL of dam 831.0 m Lowest B.L. at dam site 801.0 m Specific gravity of dam material 2.4 Max. permissible stress in compression = 1.3 N/mm^2 Density of water = 1 t/m^3 Velocity of wind = 25 Kmph Fetch of water for such wind = 40 Km	**07**
	(b)	Write a note on foundation problems for dams and their remedies.	**07**
		OR	
	(b)	What is rolled fill earth dam and hydraulic fill earth dam?	**07**
Q.3	**(a)**	Explain hydraulic failures and seepage failures of earthen dams.	**07**
	(b)	Give criteria for safe design of earth dam.	**07**
		OR	
Q.3	**(a)**	Discuss the Swedish slip circle method for checking the stability of downstream slop under steady seepage condition.	**07**
	(b)	Discuss in brief the causes of failure of gravity dam.	**07**
Q.4	**(a)**	Explain how Water, Wave, Ice, & Silt pressure that act on gravity dam with neat sketch.	**07**
	(b)	Explain methods of reduction of uplift pressure with neat sketch.	**07**
		OR	
Q.4	**(a)**	Explain how earthquake effect taken in to account in the design of gravity dam.	**07**
	(b)	Distinguish clearly between a low gravity dam and high gravity dam. Derive an expression used for such a distinction. Determine the critical height of a gravity dam, taking the specific gravity of concrete as 2.40 and allowable compressive stress as 3340 KN/m^2 .	**07**
Q.5	**(a)**	Why spillway are considered “safety valve “ for dams. Classify and write suitability of various spillways.	**07**
	(b)	Discuss design principles of Bucket types of energy dissipaters with neat sketches.	**07**
		OR	
Q.5	**(a)**	What is HR and CR in the context with the canal network? Enlist function of each with neat sketch.	**07**
	(b)	Write design principles of glacis type fall.	**07**

****