Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VIII • EXAMINATION – SUMMER-2015

Subject Code: 180601 **Date:15/05/2015**

Subject Name: Design of Hydraulic Structures

Time: 10.30AM-01.00PM **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)**	Discuss factors governing the selection of type of dam.	**07**
	(b)	(i) Write a brief note on "Arch dam".	**04**
		(ii) Enumerate various factors deciding location of canal fall.	**03**
Q.2	**(a)**	Discuss various external forces acting on a gravity dam.	**07**
	(b)	Describe hydraulic and seepage failure of earthen dam.	**07**
		OR	
	(b)	Classify spillways and discuss any one in detail. Give essential requirements of spillway.	**07**
Q.3	**(a)**	Describe the method used for analyzing stability of slope of an earthen dam.	**07**
	(b)	Describe design features of chute spillway.	**07**
		OR	
Q.3	**(a)**	Discuss seepage control in earthen dam.	**07**
	(b)	An overflow spillway with its upstream face vertical is to be design for a flood of 7200 cumec. Height of spillway crest above river bed is 52 m. The end walls of spillway are 75 m apart and there are 5 piers, each 2 m wide. Determine total head over the crest of spillway. Take C = 2.2, Ka = 0.10 and Kp = 0.01. Also draw spillway profile.	**07**
Q.4	**(a)**	Explain various modes of failure of gravity dam.	**07**
	(b)	Discuss measures to control seepage through earth dam and their foundation	**07**
		OR	
Q.4	**(a)**	Write a short note on inspection galleries and contraction joints in gravity dam.	**07**
	(b)	Explain analytical method for stability analysis of a gravity dam.	**07**
Q.5	**(a)**	Describe various energy dissipation devices used below spillway in relation to the position of jump height curve (JHC) and tail water rating curve (TWRC).	**07**
	(b)	Describe the procedure for designing a head regulator for distributary.	**07**
		OR	
Q.5	**(a)**	Describe with neat sketches various types of bucket type energy dissipaters.	**07**
	(b)	Explain stepwise procedure for designing a Sarda type fall.	**07**

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