Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–VII EXAMINATION – WINTER 2015

Subject Code:X70601 **Date:09/12/2015**

Subject Name: Design of Hydraulic Structures

Time: 10:30pm to 1:00pm **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)**	Explain Buttress Dam. Mention advantages & disadvantages for the same.	**07**
	(b)	Explain briefly the factors affecting in selection of type of dam.	**07**
Q.2	**(a)**	Describe the method for plotting a phreatic line for homogeneous earth dam with a horizontal drainage filter.	**07**
	(b)	Define Flow net. A flow-net is plotted for homogeneous earthen dam of height 22 m and free board 2.0 m. Number of potential drops and flow channels are 10 and 4 respectively. The dam has a horizontal filter of 30 m length at a downstream end and the coefficient of permeability of the dam material is 5 x 10^{-4} cm/sec. Calculate the discharge per m run of the dam.	**07**
		OR	
	(b)	Explain the procedure to adopt for stability analysis of slopes of earthen dam by Swedish slip Circle Method.	**07**
Q.3	**(a)**	Derive expression for principal stress and shear stress at the heel and toe of dam	**07**
	(b)	Enlist various forces acting on a dam. Explain wave pressure and silt pressure.	**07**
		OR	
Q.3	**(a)**	Explain different types of galleries of concrete dam.	**07**
	(b)	Design the practical profile of a concrete gravity dam for the given data : RL of base of dam = 65 m RL of HFL = 130 m Safe compressive stress in concrete = 3000 KN/m^2 Specific gravity of concrete = 2.4 Height of waves = 1.0 m	**07**
Q.4	**(a)**	Give classification of spillway. Explain design features of ogee spillway.	**07**
	(b)	What is stilling basin ? discuss various types of stilling basin.	**07**
		OR	
Q.4	**(a)**	Describe characteristics of hydraulic jump. Explain types of jumps.	**07**
	(b)	What is Bucket type energy dissipator ?	**07**
Q.5	**(a)**	Write short note on (1) Sharda type fall (2) Cross regulator	**07**
	(b)	Describe (1) design of crest (2) design of cistern for straight glacis fall.	**07**
		OR	
Q.5	**(a)**	What are the Factors affecting the location of fall ?	**07**
	(b)	Discuss various functions of distributary head regulator.	**07**

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