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GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (NEW) EXAMINATION – WINTER 2018

Subject Code: 2180601 **Date: 19/11/2018**

Subject Name: Design Of Hydraulic Structures

Time: 02:30 PM TO 05:00 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)**	Discuss salient features of Narmada dam.	**03**
	(b)	What are the advantages and disadvantages of gravity dam over other dams	**04**
	(c)	Describe the factors on which selection of site for a dam depends	**07**
Q.2	**(a)**	What do you understand by the elementary profile and a practical profile of gravity dam?	**03**
	(b)	Enlist various causes of failure of an earth dam. Discuss only structural failure causes in earth dam	**04**
	(c)	Calculate the seepage through an earth dam resting on an impervious foundation. The relevant data given below: Height of dam = 60.0 m Upstream slope = 2.75 : 1 (H:V) Free board = 2.5 m Crest width = 8.0 m Length o drainage blanket = 120.0 m Coefficient of permeability of the embankment material in X-direction = 8×10^{-7} m/s Y-direction = 2×10^{-7} m/s	**07**
		OR	
	(c)	Define phreatic line in earthen dams. Also discuss procedure for locating phreatic line in a homogeneous earth dam with a horizontal drainage filter	**07**
Q.3	**(a)**	What are the different types of earthen dams?	**03**
	(b)	Differentiate High dam and low dam.	**04**
	(c)	The figure 1 gives profile of a gravity dam with reservoir level as shown. If the coefficient of friction is 0.75, is the dam safe against sliding? Take weight density of concrete = 2.4 tonnes/m^3	**07**

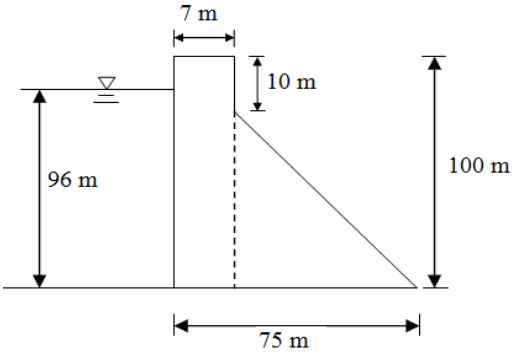

Figure 1

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OR

Q.3	**(a)**	Explain Cavitation in an Ogee spillway	**03**
	(b)	Enlist different types of stilling basin and explain any one	**04**
	(c)	Derive the expressions for determining base width of gravity dam based on stress and sliding criteria. Also derive expression for normal stress at the base of the dam.	**07**
Q.4	**(a)**	Write a short note on Ski jump bucket	**03**
	(b)	Explain Design criteria for glacis type fall.	**04**
	(c)	Discuss the various modes of failure and stability criteria of gravity dam.	**07**

OR

Q.4	**(a)**	Why drainage gallery is provided within a dam section?	**03**
	(b)	Explain energy dissipation in various positions of TWC and HJC.	**04**
	(c)	Explain Construction and Contraction joints in gravity dam	**07**
Q.5	**(a)**	Differentiate cross regulator and distributary head regulator.	**03**
	(b)	Explain the design features of a Sarda fall	**04**
	(c)	Why canal fall is provided in canal? Enlist different types of fall and explain any one.	**07**

OR

Q.5	**(a)**	Draw the L-section of a rectangular crest Sarda type canal fall	**03**
	(b)	Explain straight glasis fall with help of sketch	**04**
	(c)	Describe various design principles of cross regulator and head regulator	**07**

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