

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII (NEW) EXAMINATION – WINTER 2017

Subject Code: 2180601

Date: 15/11/2017

Subject Name: Design of Hydraulic Structures(Departmental Elective - III)

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) Classify various types of Dam. Explain any one briefly. **03**
 - (b) Describe the types of Earth Dam based on section of dam. **04**
 - (c) Figure 1 shows the section of a Gravity dam (non-overflow portion) built of concrete. Calculate the maximum vertical stresses at the heel and toe of the dam. (Neglecting earthquake effects). Assume Weight of Concrete = 23.6 kN/m^3 . Allowable stress in concrete may be taken as 2500 kN/m^2 . **07**
- Q.2**
- (a) What is a Spillway? Discuss the requirement of spillway. **03**
 - (b) List out the various modes of failure of a Concrete Gravity Dam. Explain any one. **04**
 - (c) Discuss recommendations for the design section of an Earth Dam. **07**
- OR**
- (c) What are the factors on which selection of site for a dam depends? Discuss briefly. **07**
- Q.3**
- (a) Explain different Engineering characteristics of soil. **03**
 - (b) Write a short note on settlement of Rock Fill Dams. **04**
 - (c) Define Phreatic line in earth dam. Discuss the graphical method for Phreatic line in a Homogeneous Earth Dam with a Horizontal Drainage Filter. **07**
- OR**
- Q.3**
- (a) Classify the joints in Gravity Dam. Explain any one. **03**
 - (b) Write a short note on Roller Compacted Concrete Gravity Dam. **04**
 - (c) Discuss the practical profile of a Gravity Dam. **07**
- Q.4**
- (a) Explain Cavitation in an Ogee spillway. **03**
 - (b) What is stilling basin. Describe Chute blocks. **04**
 - (c) Classify the different type of spillway. Describe Ogee spillway. **07**
- OR**
- Q.4**
- (a) Describe how location of Canal fall is decided? **03**
 - (b) Write a short note on Ski jump bucket. **04**
 - (c) Explain various Energy Dissipation measures adopted below spillway for relative up and down position of J.H.C. and T.W.R.C. **07**

P.T.O.

- Q.5

(a)

Define : Canal Fall, Off taking channel, Parent Channel

03

(b)

List out the types of Falls and explain any one.

04

(c)

Differentiate between Cross Regulator and Distributary Head Regulator. Why Drainage gallery is provided within a dam section?

07
- OR
- Q.5

(a)

Briefly explain the types of Jumps based on Froude number.

03

(b)

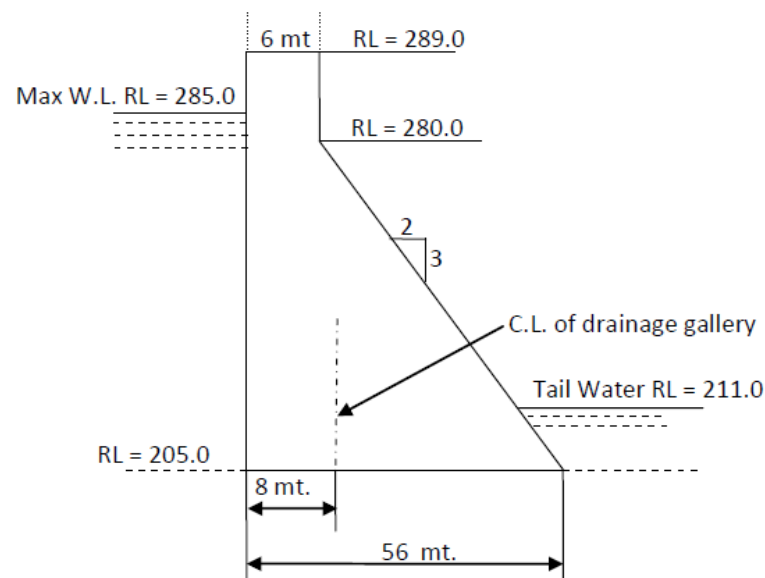
What is Canal Regulation? Discuss the important of Canal Regulation Works.

04

(c)

Explain the procedure for designing a Straight Glacis Fall.

07



(Figure is not to scale)

Figure – 1
