

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII (OLD) EXAMINATION – WINTER 2023****Subject Code:2180601****Date:08-12-2023****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.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) What are the essential requirements of spillway? **03**
 (b) Write a note on surface protection of upstream face of earth dam. **04**
 (c) How will you decide a site for different types of dam? **07**

- Q.2** (a) Explain seepage failures in earth dam. **03**
 (b) Explain in short, with a sketch, the component parts and their function, of a rock fill dam. **04**
 (c) What are the practical criteria for the design of earth dams? **07**

OR

- (c) Write a note on seepage control measures in earth dams. **07**

- Q.3** (a) How can you determine the quantity of discharge passing over an ogee spillway? **03**
 (b) Describe with neat sketch USBR stilling basin IV. **04**
 (c) How will the arrangement of energy dissipation device be for the situation where tail water curve lies below y_2 curve **07**

OR

- Q.3** (a) Write a note on Cavitation. **03**
 (b) Write a note on stilling basins & their components. **04**
 (c) Write a detailed note on variation of coefficient of discharge with various factors. **07**

- Q.4** (a) Where the advantages of earth dam over gravity dam? **03**
 (b) Determine the forces due to self-weight and water pressure on the non-overflow section of a gravity dam as shown in fig 1. **04**
 (c) What are different ways in which a solid gravity dam may fail? How can the failure be avoided. **07**

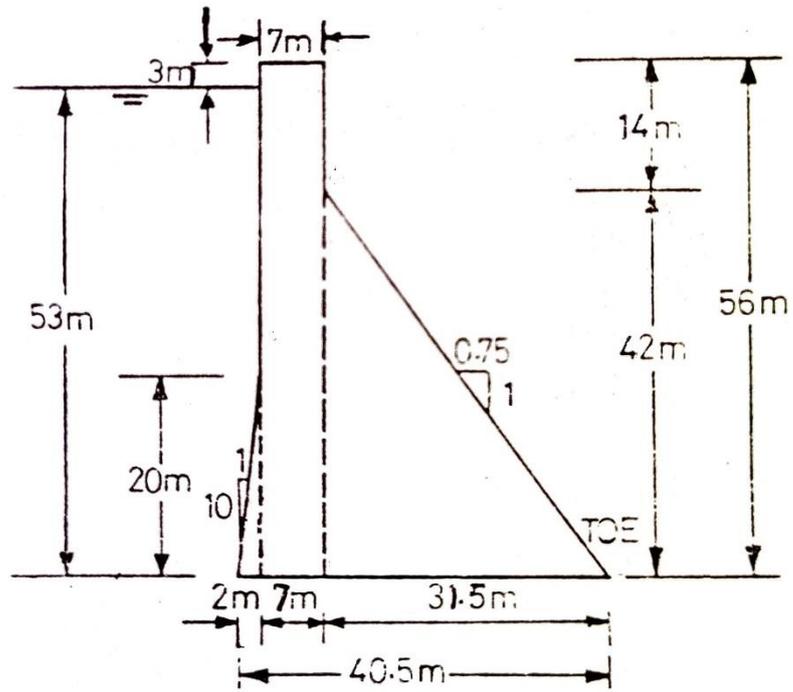
OR

- Q.4** (a) Where the advantages of arch dam over gravity dam? **03**
 (b) What are different galleries in a concrete gravity dam? **04**
 (c) Explain how earthquake effects are accounted for in the design of gravity dam. **07**

- Q.5** (a) What do you understand by dam outlet? What are its functions? **03**
 (b) Explain Rapid falls. **04**
 (c) What do you understand by a head regulator? State the functions of distributary head regulator. **07**

OR

- Q.5** (a) What are the different types of dam outlets? **03**
 (b) Explain Ogee Falls **04**
 (c) What do you understand by canal falls? How would you determine its location? **07**



**Figure 1 non-overflow section of a gravity dam
(for question 4 (b))**
