

Enrollment No: \_\_\_\_\_

Exam Seat No: \_\_\_\_\_

# C.U.SHAH UNIVERSITY

## Summer Examination-2019

**Subject Name: Design of Hydraulic Structures**

**Subject Code: 4TE06DHS1**

**Branch: B.Tech (Civil)**

**Semester: 6 Date : 20/04 /2019**

**Time : 10:30 To 01:30**

**Marks : 70**

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
  - (2) Instructions written on main answer book are strictly to be obeyed.
  - (3) Draw neat diagrams and figures (if necessary) at right places.
  - (4) Assume suitable data if needed.
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**Q-1 Attempt the following questions: (14)**

- a) What is meant by 'useful storage' in dam?
- b) Give full form of OMC.
- c) Define spillway.
- d) Enlist the functions of a cross regulator in a canal network.
- e) What is phreatic line for an earth dam?
- f) Write the name of the highest gravity dam in India.
- g) Define Seepage.
- h) Write the function of 'water stops' in gravity dam.
- i) What are contraction joints in gravity dam?
- j) Give the function of energy dissipaters.
- k) What is canal escape?
- l) Enlist the types of dam.
- m) Draw the profile of ogee spillway.
- n) What is meant by canal fall?

**Attempt any four questions from Q-2 to Q-8**

**Q-2 Attempt all questions (14)**

- (a) Discuss the advantages of a siphon spillway. **08**



(b) Write the function of distributary head regulator. 06

**Q-3 Attempt all questions** (14)

(a) What are the different ways by which a concrete gravity dam may fail, and how will you ensure its safety against each type of failure? 08

(b) What should be the maximum depth of elementary profile of a dam if the safe limit of stress on the masonry should not exceed  $150 \text{ T/m}^2$ . Assume unit weight of masonry =  $2.40$ . 06

**Q-4 Attempt all questions** (14)

(a) Differentiate between low gravity dam and high gravity dam 06

(b) Determine the forces due to self weight and water pressure on the non-overflow dam as shown in Figure 1. Take specific weight =  $24 \text{ kN/m}^3$  and  $w = 9.81 \text{ kN/m}^3$  08

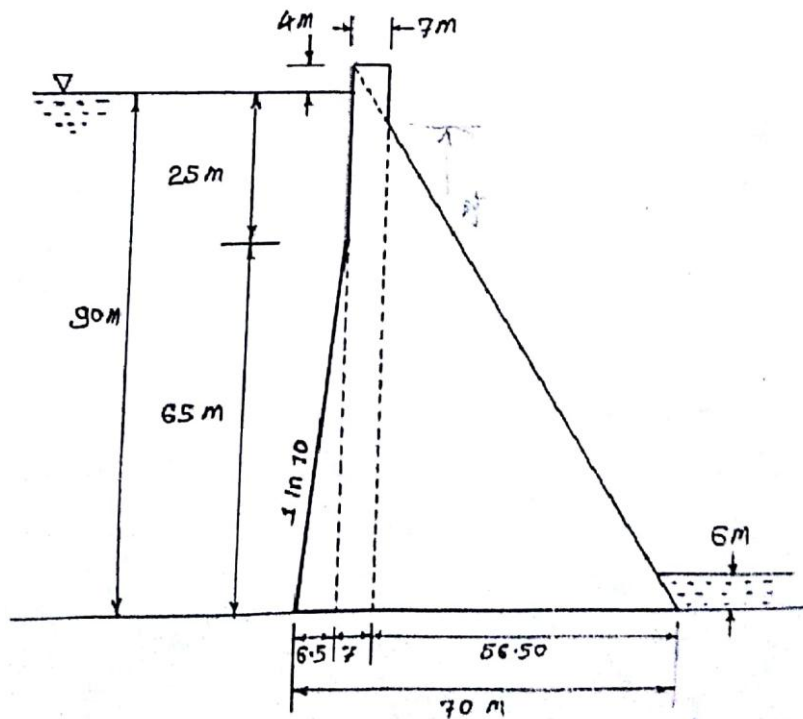


Figure 1

**Q-5 Attempt all questions** (14)

(a) Describe the design feature of chute spillway. 06

(b) Briefly discuss the factors affecting the selection of site for a dam. 06

(c) Why is it necessary to provide a fall in a canal? 02

**Q-6 Attempt all questions** (14)

(a) Discuss in brief the causes of failure of earthen dams. 07

(b) Distinguish between the Rolled-fill earth dam and Hydraulic-fill earth dam 04

(c) Enlist different forces that may act on a gravity dam. Indicate their magnitudes, 03



- directions and locations.
- Q-7 Attempt all questions (14)**
- (a) Discuss step by step the analytical procedure that you will adopt for analyzing the stability of gravity dams. **07**
  - (b) Enumerate the various types of spillways, and describe in details the most widely used type. **07**
- Q-8 Attempt all questions (14)**
- (a) Write short note on straight glacis fall and Sharda fall. **08**
  - (b) Write a brief note on necessity and method of foundation treatment of dams. **06**

