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.

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 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 kN/m^3 and w= 9.81 kN/m^3	**08**

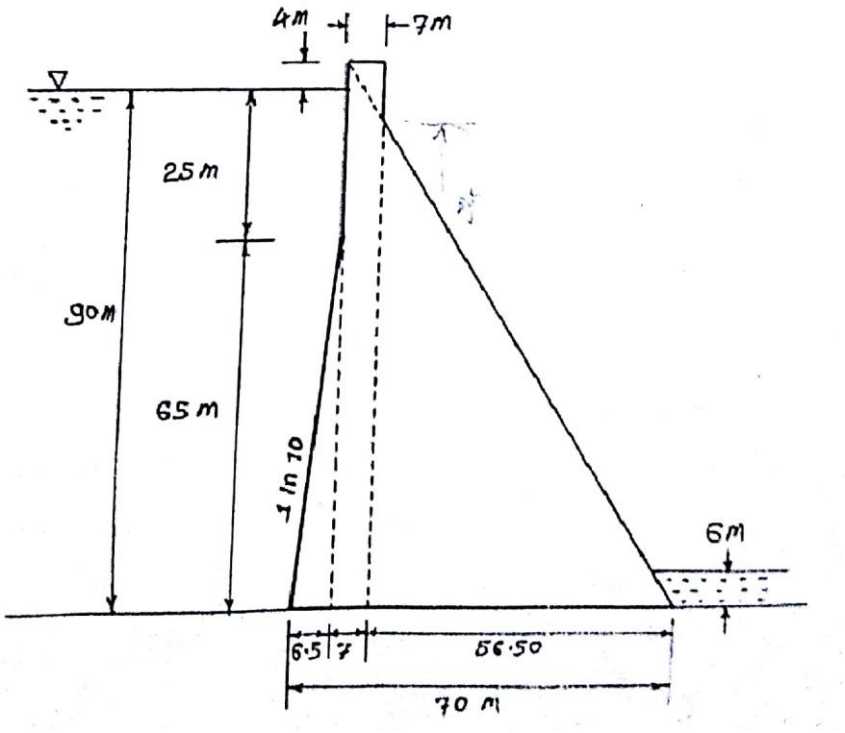

Figure 1

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**