

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII EXAMINATION – WINTER 2025

Subject Code:3170621

Date:01-12-2025

Subject Name:Design of hydraulic structures

Time:10:30 AM TO 01:00 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.

	MARKS
Q.1 (a) Explain the importance of subsurface exploration.	03
(b) Discuss the criteria for selection of particular type of dam.	04
(c) Explain the effect of earthquake force in the design of gravity dam.	07
Q.2 (a) What are the functions of gallery in a gravity dam?	03
(b) Discuss various foundation treatment methods.	04
(c) Discuss the practical profile of gravity dam.	07
OR	
(c) Describe the construction techniques of roller compacted concrete dams.	07
Q.3 (a) What are the functions of Water stops in gravity dam?	03
(b) Write a brief note on joints in gravity dam.	04
(c) Describe hydraulic and seepage failure of earthen dam.	07
OR	
Q.3 (a) Obtain the condition for no-tension criteria in a gravity dam.	03
(b) Write a note on settlement of rockfill dams.	04
(c) Describe the method used for analyzing stability of slope of an earthen dam.	07
Q.4 (a) Write a note on filters in earth dams.	03
(b) Explain the slope protection in earth dams.	04
(c) Explain the method of locating center of critical slip circle in earth dams.	07
OR	
Q.4 (a) Give the comparison between ogee spillway and chute spillway.	03
(b) Discuss the cavitation in ogee spillway.	04
(c) Describe design features of chute spillway.	07
Q.5 (a) Define energy dissipators. Discuss the needs to provide them.	03
(b) Write a note on side channel spillway.	04
(c) Explain design criteria of ogee spillway.	07
OR	
Q.5 (a) Briefly explain IS type I stilling basin.	03
(b) Explain various types of hydraulic jumps.	04
(c) Describe various energy dissipation devices used below spillway in relation to the position of jump height curve (JHC) and tail water rating curve (TWRC).	07
