

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII (NEW) - EXAMINATION – SUMMER 2018

Subject Code: 2180601

Date: 02/05/2018

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

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.**

		MARKS
Q.1	(a) Discuss different types of reservoirs in brief.	03
	(b) What are the factors considered for selecting a suitable site for the dam	04
	(c) Explain how the storage capacity of reservoir and height of dam are determined.	07
Q.2	(a) Explain the various forces causing instability in gravity dam.	03
	(b) What are the advantages and disadvantages of gravity dam over other dams	04
	(c) Differentiate between low gravity dam and high gravity dam? Determine the dimensions of the practical profile of the low gravity dam.	07
OR		
Q.3	(c) Explain different types of galleries in the gravity dam.	07
	(a) What are the different types of earthen dams?	03
	(b) Write design criteria of the earthen dam.	04
	(c) Explain causes of failure of earthen dam in brief.	07
OR		
Q.3	(a) Describe seepage analysis of the earthen dam	03
	(b) A flow net is plotted for a homogeneous earthen dam of height 24 m and free board 2 m. The result obtained are , No of potential drops = 10 No of flow channels = 4 The dam has horizontal filter of 30 m length at the downstream end and the coefficient of permeability of the dam material is 5×10^{-4} cm/sec. Calculate the discharge per m run of the dam.	04
	(c) An earthen dam made of a homogeneous material has the following data; Level of top of dam = 205 m Level of deepest river bed = 181 m HFL of reservoir = 202.5 m Width of top of dam = 4.5 m U/S slope = 3:1 D/S slope of dam = 2:1 Length of horizontal filter = 25 m Coefficient of permeability of dam material = 5×10^{-4} cm/sec. Determine the phreatic line for this dam section.	07

- Q.4** (a) Explain settlement and deformation in rock fill embankment. **03**
 (b) What are the different types of spillway? Explain chute spillway in brief. **04**
 (c) Explain how the ogee spillway is designed. **07**
- OR**
- Q.4** (a) Describe cavitation on the spillway. **03**
 (b) What is energy dissipation for spillway? Explain USSR stilling basin -II **04**
 (c) Discuss briefly the various types of energy dissipators for spillway under different relative positions of TWC and JHC. **07**
- Q.5** (a) Why are drops constructed in an irrigation canal? **03**
 (b) Explain straight glasis fall with help of sketch. **04**
 (c) Write design criteria for various components of Sharda type fall. **07**
- OR**
- Q.5** (a) What is canal regulation? Write various types of canal regulation works **03**
 (b) What are the different ways by which concrete gravity dam may fail? Explain all in brief. **04**
 (c) Write design criteria for head regulator and for cross regulator. **07**
