

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– VIII (New) EXAMINATION – WINTER 2019****Subject Code: 2180601****Date: 25/11/2019****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.

- Q.1** (a) Enlist and explain the dams according to hydraulic design. **03**
 (b) What are the factors considering for selection of type of dam? **04**
 (c) Explain the various causes of failure of earthen dam in brief. **07**
- Q.2** (a) Differentiate between low gravity dam and high gravity dam. **03**
 (b) Explain in brief types of rock-fill earthen dam with sketch. **04**
 (c) Define spillway? What is the purpose to provide it? What are the essential requirements? Where the spillway is located? **07**
- OR**
- (c) An earthen dam made of a homogeneous material has the following data: **07**
 Level of top of dam = 200.0 m
 Level of deepest river bed = 178.0 m
 H.F.L. of reservoir = 197.5 m
 Top width of the dam = 4.5 m
 Upstream slope = 3 : 1
 Downstream slope = 2 : 1
 Co-efficient of permeability of dam material = 5×10^{-4} cm/sec
 Determine the phreatic line for this dam section.
- Q.3** (a) Explain the different types of filters in earthen dam. **03**
 (b) Draw the neat sketches of elementary profile & practical profile of concrete gravity dam. **04**
 (c) Discuss the Swedish slip circle method for checking the stability of downstream slope under steady seepage condition. **07**
- OR**
- Q.3** (a) What is HR and CR? Give the function of each. **03**
 (b) Enlist the various dam outlet works and give the function of each. **04**
 (c) Enlist and explain the various circumstances/modes due to which concrete gravity dam may fail. **07**
- Q.4** (a) Explain drainage gallery in dams. **03**
 (b) What are the different types of spillways? Explain open channel spillway in brief. **04**
 (c) Differentiate between Jump Height Curve (JHC) and Tail Water Curve (TWC). What are the different possibilities of occurrence of JHC and TWC? **07**
- OR**
- Q.4** (a) Explain ogee fall with sketch. **03**
 (b) Enlist various drop structure and give function of each. **04**
 (c) Define Phreatic line in earthen dam. Discuss the graphical method for the Phreatic line in a Homogeneous earthen dam with a horizontal drainage filter. **07**
- Q.5** (a) Classify concrete dams. Discuss briefly each type. **03**
 (b) Explain the term Chute blocks and Sills and Dentated sills **04**

- (c) What is a fall in canal? Write necessity of a fall and governing factors in locating a fall. **07**

OR

- Q.5** (a) Explain in brief types of hydraulic jump based on Froude number. **03**
(b) Show the forces acting on the gravity dam. **04**
(c) What are the design criteria for various components of Sharda type fall. **07**
