

GUJARAT TECHNOLOGICAL UNIVERSITY**PDDC - SEMESTER-VII • EXAMINATION – WINTER • 2014****Subject Code: X 70601****Date: 28-11-2014****Subject Name: Design of Hydraulic Structures****Time: 10:30 am - 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.

- Q.1** (a) Explain various classifications of dam. **07**
 (b) Explain briefly how the stability of earthen slopes is checked by the slip circle method. **07**
- Q.2** (a) Discuss the causes of failure of earth dams. **07**
 (b) Enlist various types of spillways and discuss any one in detail. **07**
- OR**
- (b) Explain ski-jump bucket type energy dissipater. **07**
- Q.3** (a) Discuss in brief merits & demerits of a gravity dams. **07**
 (b) A trapezoidal concrete Gravity dam having top width 8m, U/S face vertical & D/S face 0.7H : 1V, total height 60m. & water is stored up to 57m. If the coefficient of friction is 0.75, is the dam safe against sliding? **07**
- OR**
- Q.3** (a) Discuss the various purposes for which galleries are provided in dams. **07**
 (b) A gravity dam 30m high is trapezoidal in section with a top width of 3m, upstream face vertical and downstream face has a better of 0.7H:1V. Find vertical, principal and shear stresses at heel and toe. **07**
- Q.4** (a) What is a spillway? What are the essential requirements? Describe the various components of a spillway. **07**
 (b) Draw seepage line and calculate discharge through homogeneous section of an earth dam having following data. **07**
 -Top width of dam = 6 m
 -u/s slope = 3H : 1V
 -d/s slope = 2.5H : 1V
 -Total height of dam above base = 30 m
 -Maximum water level above base = 27 m
 -Horizontal filter length from toe = 25 m
 -Co-efficient of permeability = 8×10^{-3} cm/sec
- OR**
- Q.4** (a) Discuss the Geological and Topographical features which affect the selection of the type of dam. **07**
 (b) Design a suitable section for the overflow section of a concrete gravity dam having D/S 0.7H:1V. The design discharge for the spillway is 6000 m³/s. The effective length of spillway may be taken as 50m. **07**
- Q.5** (a) What are the falls and why are they constructed? Discuss the comparative merits and demerits of Notch and Sarda type falls. **07**
 (b) Classify various types of cross-drainage works. Explain any one type in detail. **07**
- OR**
- Q.5** (a) Explain functions of head regulator and cross-regulator. **07**
 (b) Write short note on canal Escape. **07**