

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII (NEW) EXAMINATION – WINTER 2018****Subject Code: 2180601****Date: 19/11/2018****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) Discuss salient features of Narmada dam. **03**
 (b) What are the advantages and disadvantages of gravity dam over other dams **04**
 (c) Describe the factors on which selection of site for a dam depends **07**

- Q.2** (a) What do you understand by the elementary profile and a practical profile of gravity dam? **03**
 (b) Enlist various causes of failure of an earth dam. Discuss only structural failure causes in earth dam **04**
 (c) Calculate the seepage through an earth dam resting on an impervious foundation. The relevant data given below: **07**

Height of dam = 60.0 m

Upstream slope = 2.75 : 1 (H:V)

Free board = 2.5 m

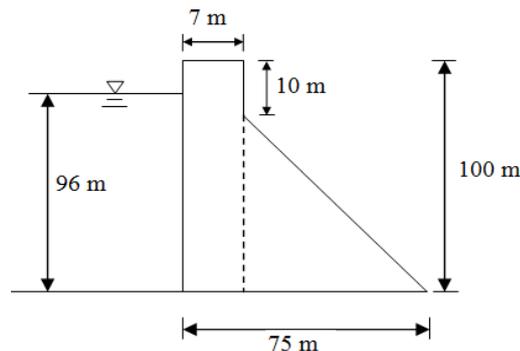
Crest width = 8.0 m

Length of drainage blanket = 120.0 m

Coefficient of permeability of the embankment material

in X-direction = 8×10^{-7} m/sY-direction = 2×10^{-7} m/s**OR**

- (c) Define phreatic line in earthen dams. Also discuss procedure for locating phreatic line in a homogeneous earth dam with a horizontal drainage filter **07**
- Q.3** (a) What are the different types of earthen dams? **03**
 (b) Differentiate High dam and low dam. **04**
 (c) The figure 1 gives profile of a gravity dam with reservoir level as shown. If the coefficient of friction is 0.75, is the dam safe against sliding? Take weight density of concrete = 2.4 tonnes/m^3 **07**

**Figure 1**

OR

- Q.3** (a) Explain Cavitation in an Ogee spillway **03**
(b) Enlist different types of stilling basin and explain any one **04**
(c) Derive the expressions for determining base width of gravity dam based on stress and sliding criteria. Also derive expression for normal stress at the base of the dam. **07**
- Q.4** (a) Write a short note on Ski jump bucket **03**
(b) Explain Design criteria for glacis type fall. **04**
(c) Discuss the various modes of failure and stability criteria of gravity dam. **07**

OR

- Q.4** (a) Why drainage gallery is provided within a dam section? **03**
(b) Explain energy dissipation in various positions of TWC and HJC. **04**
(c) Explain Construction and Contraction joints in gravity dam **07**
- Q.5** (a) Differentiate cross regulator and distributary head regulator. **03**
(b) Explain the design features of a Sarda fall **04**
(c) Why canal fall is provided in canal? Enlist different types of fall and explain any one. **07**

OR

- Q.5** (a) Draw the L-section of a rectangular crest Sarda type canal fall **03**
(b) Explain straight glacis fall with help of sketch **04**
(c) Describe various design principles of cross regulator and head regulator **07**
