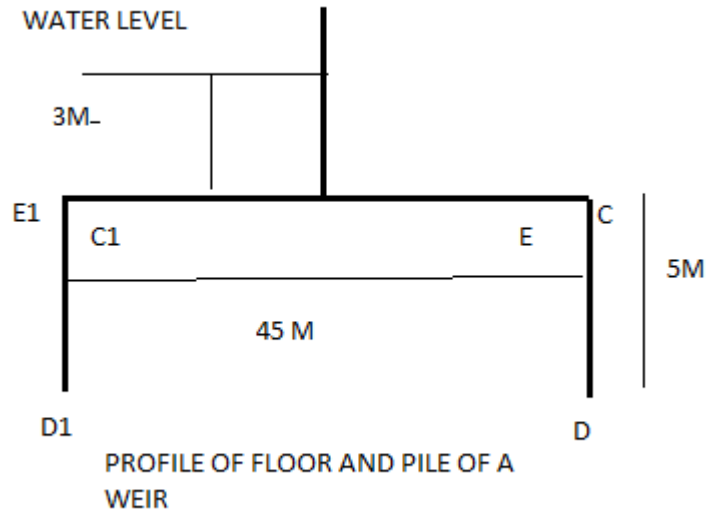


GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII (OLD) - EXAMINATION – SUMMER 2017****Subject Code:180601****Date:04/05/2017****Subject Name: Design of Hydraulic Structures****Time:10:30 AM to 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Enlist different forces acting on gravity dam and explain (i) Uplift pressure and (ii) Earthquake pressure **07**
 (b) Explain method of drawing phreatic line when filter is provided at toe. **07**
- Q.2** (a) Explain factor affecting selection of dam site **07**
 (b) Calculate downstream profile of a ogee spillway with $Q=6500$ cumec, Average bed level of river 50.00 m , Head of crest = 152.00 m , spillway length 5 spans each of 11 m, thickness of pillar = 2 m, $k_p=0.01$, $k_a=0.1$, Assume any other data needed **07**
- OR**
- (b) Explain Swedish sleep circle method for analysis of stability of earthen dam slope . **07**
- Q.3** (a) For a Gravity Dam , Given $\Sigma M+=329800$ t.m, $\Sigma M - = 239400$ t.m, , $\Sigma v=5300$, $\Sigma H=4900$ t, $\mu=0.7$, $B=75$ m , $q=140$ t/m². Calculate normal stress at heel and toe, Also calculate Factor of safety against overturning, Factor of safety against sliding, and Shear Friction Factor **07**
 (b) Explain design criteria for sarda type of fall when $Q > 14$ cumec **07**
- OR**
- Q.3** (a) Explain Bucket type energy dissipator **07**
 (b) Give classification of different type of earthen dam . **07**
- Q.4** (a) Explain Bligh's creep theory . **07**
 (b) Explain cross regulator and Head regulator in canal network . **07**
- OR**
- Q.4** (a) Describe Khosla's method of independent variable **07**
 (b) Explain glacis type of fall . **07**
- Q.5** (a) Explain Factor of safety against overturning (ii) Factor of safety against sliding (iii) S. F. F. **07**
 (b) Explain different type of load combination of gravity dam for analysis also discuss elementary profile of gravity dam . **07**
- OR**
- Q.5** (a) Work out pressure at ϕ_{E1} , ϕ_{D1} , ϕ_{C1} , ϕ_E , ϕ_D , ϕ_C For the two pile 5 m depth at upstream and downstream of a floor of 45 m . and head of water 3 m **07**



(b) Explain construction method of earthen dam

07
