



Reg. No. : .....

Name : .....

**Seventh Semester B.Tech. Degree Examination, November 2013  
(2008 Scheme)  
08.702 : DESIGN OF HYDRAULIC STRUCTURES (C)**

Time : 4 Hours

Max. Marks : 100

- Instructions :** i) Assume suitable data *wherever* necessary.  
ii) Use of Khosla's chart and Blench curve is **permitted** in the examination hall.

**PART – A**

Answer **all** questions.

1. Discuss the various purposes for which galleries are provided in dams.
2. Describe briefly the different types of spillways.
3. What are the limitations of Bligh's creep theory ?
4. What are canal falls ? What are the different types of canal falls ? **(4x5=20 Marks)**

**PART – B**

5. The following are the details of a straight gravity dam.

Foundation level = + 100.65m

Height of dam = 250 m.

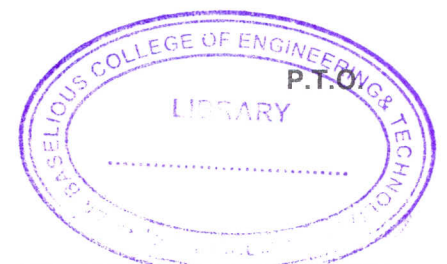
Maximum water surface elevation = + 347.65 m

Top width = 8 m

Upstream face is vertical and down stream face vertical upto elevation + 340.65 and has a slope of 0.8 horizontal to vertical below this elevation. Assume no tail water and no drainage galleries. Determine the factor of safety against overturning sliding and maximum principal stress at toe. Density of concrete is  $24\text{kN/m}^3$  and co-efficient of friction is 0.75.

OR

10





6. What are spillways ? Explain the features of different types of spillways with sketches. 10
7. A weir on permeable foundation has a level floor of negligible thickness and is 10m long in the direction of flow. At the two ends of the floor 2.5m deep piles are provided. Using Khosla's theory calculate the uplift pressure at the mid length of the floor. The effective head of water is 2m. 10
- OR
8. Sketch the layout of a typical diversion head work and describe briefly the functions of various components of diversion head works. 10

PART – C

9. a) Design a suitable cross drainage work given the following particulars.
- | <b>Canal</b>                      | <b>Drainage</b>                   |
|-----------------------------------|-----------------------------------|
| Full supply discharge = 25 cumecs | High flood discharge = 320 cumecs |
| Full supply level = + 113.50      | High flood level = + 110.00       |
| Canal bed level = + 112.00        | High flood depth = 3.20 m         |
| Canal bed width = 18 m            | General ground level = +113.10    |
| Canal water depth = 1.50 m        |                                   |
| Canal side slope = 1.5 H : IV     |                                   |
- 30**
- b) Draw the following views to a suitable scale.
- i) Half plan at top and half at foundation. 15
  - ii) Longitudinal section along the centre line of canal. 15
- OR
10. a) Design a cross regulator and a head regulator for a channel which takes off from the parent channel with the following data.
- Discharge of parent channel = 140 cumecs  
 Discharge of distributory = 15 cumecs  
 FSL of parent channel, u/s = 210.00 m  
 FSL of parent channel, d/s = 209.8 m  
 Bed width of parent channel, u/s = 52 m  
 Bed width of parent channel, d/s = 46 m  
 Depth of water in the parent channel = 2.5m at u/s and d/s  
 FSL of distributory = 209.1 m  
 Silt factor = 0.8 m  
 Assume safe exit gradient =  $\frac{1}{5}$ . 30
- b) Draw the following views to a suitable scale
- i) Cross section of cross regulator along the longitudinal axis of parent channel. 15
  - ii) Cross section of head regulator along the longitudinal axis of distributory. 15