

- (b) What is uplift pressure ? What are the various methods adopted to reduce the uplift pressure ?10

UNIT – IV

8. (a) What are the different kinds of spillways ? and how they are selected for individual conditions ?10
(b) Discuss briefly the design principal involve in design of ogee spillways. .10
9. (a) What do you meant by an 'Energy dissipater' ? discuss various methods used for energy dissipater below spillways. 10
(b) What is meant by priming ? Discuss the priming arrangement used in Saddle siphoned Spillways. 10

Roll No.

24379

**B. Tech 6th Semester (Civil)
Examination – May, 2018**

IRRIGATION ENGINEERING - I

Paper : CE-304-F

Time : Three Hours] [Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any *five* questions, all question carry equal marks. Question No. **1** is **compulsory**. Taking at least *one* question from each Unit.

1. Write short notes on the following : 20
- (a) Drainage Gallery
 - (b) Forces Acting on a Gravity dam
 - (c) Silt excluder
 - (d) Methods of control of seepage in dam
 - (e) Siphons Aqueduct

UNIT - I

2. (a) Design the size and number of notches required for a canal drop with following particulars, 10
Full Supply discharge= $20 \text{ m}^3/\text{s}$
Bed width = 14 meters; F.S. Depth= 1.9 meters
- (b) Design 1 meter Sarda Fall on a channel carrying $20 \text{ m}^3/\text{s}$ discharge, whose bed width and water depth are 14 meter and 1.9 meter respectively. 10
3. (a) Describe with neat sketch different type of Canal Escape, that may be constructed on Modern 'Canal projects. 10
- (b) What do you mean by Canal regulation? Enumerate the different engineering structures which may be required in a canal regulation work. Explain working of each of them. 10

UNIT - II

4. Design and give dimensional Sketch of an aqueduct to carry water of an earth 20
canal over a drainage.
RL of bed of Drainage = 520 meters
HFL of Drainage= 523 m
Bed width of drainage= 50 m
Side slope of drainage at crossing= 1/2 :1
RL of ground = 525 m

RL of bed of Canal = 524.5 m
Discharge of Canal $30 \text{ m}^3 / \text{s}$
Depth of water in Canal = 1.70 m
Bed width of canal= 22 m

5. (a) Write difference between Bligh's creep theory and Khosla's Theory. 5
- (b) Draw a neat layout of Diversion head works and indicate the various components of the system. Briefly indicate the function of each component. 15

UNIT - III

6. A concrete dam can be assumed to be trapezoidal in section having a top width of 2 meter and bottom width of 10 meter. Its height is 12 meter and upstream face has a batter of 1:10. Give an analysis of the stability of the dam for the base section for overturning and sliding in full reservoir condition assuming no free board allowance but allowing for uplift pressure. Assuming uplift pressure intensity factor is 100%. Also determine compressive stresses at toe and heel. Also determine major and minor principal stresses and shear stresses developed. Take unit weight of concrete to be 24 kN/m^3 , unit shear strength of concrete is 1400 kN/m^2 , and coefficient of friction between concrete and foundation is 0.7 20
7. (a) What is meant by the elementary profile of a gravity dam; how is it deduced? What should be the maximum depth of an elementary profile of a dam if the safe limit of stresses on the masonry should not exceed 1500 kN/m^2 ? 10