Roll No. .....

24379

B. Tech. 6th Semester (Civil Engg.)

Examination – May, 2014

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 : Answer ***five*** questions selecting ***one*** from each section and Q. No.1 is ***compulsory***

1. Write short notes on any ***four*** of the following : 4 × 5

(i) Canal escapes

(ii) Causes of failure of a hydraulic structure

(iii) Drainage galleries

(iv) Forces acting on a concrete gravity dam

(v) Design of filters in earth dam

(vi) Canal alignment

(vii) Stability criteria of an earth dam

SECTION – A

2. What is a canal fall ? What is the proper location of a canal fall ? Explain different types of falls with neat sketches. 20

3. What are the design principles of Straight Glacis Fall ? 20

SECTION – B

4. (a) What is cross drainage works ? Explain different types of cross drainage work along with neat sketches. 15

(b) What are the governing criteria for selection of a suitable type of cross drainage work ? 5

5. With the help of a neat sketch explain the working of different components of a diversion head-works. 20

SECTION – C

6. The following data refers to a non-overflow section of a gravity dam : 20

R. L. of the crest of the dam =315m

R. L. of the bottom of the dam = 260 m

Full reservoir level = 312 m

Tail water level = 265 m

Top width of the dam = 12 m

Upstream face is vertical and downstream slope is 0.7 H: 1 V Drainage holes are located 8 m away from the upstream face. Unit weight of concrete = 23.5 kN/m^3

Allowable stress in concrete may be taken as 2500 kN/m^3

Coefficient of friction between concrete and foundation rocks = 0.7

Calculate :

(i) The maximum vertical stresses at the heel and toe of the dam.

(ii) The major principal stress at the toe of the dam.

(iii) The intensity of shear stress on a horizontal plane near the toe.

(iv) Factor of safety against overturning

(v) Factor of safety against sliding.

7. (a) Write different classifications of dam. What are the factors affecting the site selection of a concrete dam ? 10

(b) What are the design criteria for Earth Dam ? 10

SECTION – D

8. What is spillway ? Explain different types of spillways and their suitability along with neat sketches. 20

9. Explain different types of energy dissipaters with the help of neat sketches. 20