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

May–2012

IRRIGATION ENGG-I

Paper - CE-304-F

Time allowed : 3 hours] *[Maximum marks :100*

***Note :** Attempt **five** questions in all. **Question No. 1 is compulsory** and solve **one** question from each Section. All questions carry equal marks. Draw neat sketches. Assume any design data if missing.*

1. (a) What is meant by 'Piping' on foundation of a weir?

(b) What do you understand by exit gradient?

(c) What are spillways?

(d) What is the difference between a weir and a barrage?

(e) What is meant by 'canal escapes'?

(f) What is cistern element?

(g) What is meant by falls?

(h) Define syphon and super passage. 8×2.5=20

Section - A

2. (a) Enunciate the principle of design of Sarda type fall.

   (b) Design a 1.5^{m} Sarda type fall on a channel carrying 22.5 cumecs with a bed width of 18^{m} and water depth of 1.52^{m}. 8+12=20

3. (a) What is the importance of cistern element and in how many classes you will place it for a fall? Discuss in detail.

   (b) How will you distinguish between a cross regulator and a head regulator? Explain. 12+8=20

Section-B

4. (a) What is meant by Cross-drainage works?

   (b) Draw a typical layout plan of a diversion head work scheme, when two canals are off-taking from the river, one on each side. 6+14=20

5. (a) Explain Bligh's Creep theory for design of weirs on permeable foundations. How is Khosla's theory an improvement on it?

   (b) What are the causes of failures of weirs? Suggest the remedies. 12+8=20

Section-C

6. (a) Describe breifly how you would fix the storage capacity of a reservoir and hence height of dam required for this storage.

(b) If a dam is found to have high uplift pressures, how would you improve so that uplift is reduced. 8+12=20

7. (a) What are the points to be considered while selecting site for a dam? Describe necessary investigations thereof.

(b) What are the causes of failure of a gravity dam and what precautions should be taken against failure? 10+10=20

Section-D

8. Describe the following with neat sketches :

(a) Drop Spillway

(b) Syphon Spillway

(c) Ogee Spillway

(d) Chute Spillway

(e) Side Channel Spillway 5×4=20

9. (a) State the necessity of Spillway and how and where is it located? 8

(b) An overfall Spillway crest is 100.0^{m} above river bed. The design head for spillway is 8.0^{m}. The tail water depth above river bed for design flood is 17.5^{m} and the river bed is sound rock. Suggest a suitable energy dissipator. 12