ET-533(A)

B.Tech. Civil (Water Resources Engineering)

Term-End Examination

June, 2008

ET-533(A) : IRRIGATION ENGINEERING

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **five** questions. All questions carry equal marks. Support your answers with examples and neat diagrams, wherever necessary. Use of calculator is permitted. Assume appropriate data, if not given.*

1. (a) The sprinkler system of irrigation is an excellent method but is not used commonly in India. Discuss critically. 7

(b) Discuss, in brief, the benefits and ill-effects of assured irrigation. 4+3=7

2. Explain the following : 7×2=14

(i) Saturation Capacity and Field Capacity

(ii) Lysimeters

(iii) Rabi and Kharif Crops

(iv) Leaching and Drainage

(v) Contour Benching

(vi) Multistage and Submersible Pumps

(vii) Water logging

3. (a) What do you understand by crop rotation ? What are its advantages ? *4+3=7*

(b) A watercourse has a culturable commanded area of 1200 hectares. The intensity of irrigation for crop A is 40% and for B is 35%, both the crops being Rabi crops. Crop A has a kor period of 20 days and crop B has kor period of 15 days. Calculate the discharge of the watercourse, if the depth for crop A is 10 cm and for B it is 16 cm. *7*

4. (a) Distinguish between salinity and alkalinity of irrigation water and soil. *3+3=6*

(b) The size of a branch pipe at a given location is to be determined, given the following data : *8*

Area to be drained by the field drains = 15 ha

The drainage coefficient = 10 mm/day

Factor of safety for design discharge = 1·5

The pipe used is of corrugated variety and is to be laid at a slope of 0·25 percent.

5. (a) Write a note on subsurface irrigation, stating clearly the conditions under which this method is suitable. *7*

(b) The base period, intensity of irrigation and duty of various crops under a canal system are given in the table below. Find the reservoir capacity, if the canal losses are 20% and reservoir losses are 12%. 7

Crop	Base Period	Duty at the field (hectare/cumec)	Area under the crop (hectare)
Wheat	120	1800	4800
Sugarcane	360	800	5600
Cotton	200	1400	2400
Rice	120	900	3200
Vegetables	120	700	1400

6. (a) Explain, how specific speed as a characteristic parameter, is useful in both centrifugal and turbine pumps. 7

(b) List the factors that affect the selection of equipment for land grading and excavation. 7

7. Write short notes on any ***four*** of the following : $4 \times 3\frac{1}{2} = 14$

(a) Land grading design

(b) Type of infiltrometers

(c) Methods of surface irrigation

(d) Drain water disposal

(e) Water resources of India

(f) Evapotranspiration