2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

III B.TECH I SEMESTER REGULAR EXAMINATIONS

WATER RESOURCE ENGINEERING-I

(CIVIL ENGINEERING)

NOVEMBER 2005

TIME: 3 HOUR
MARK: 80

ANSWER ANY FIVE QUESTIONS ALL QUESTIONS CARRY EQUAL MARKS

1. (a) Irrigation is principal user of water. Explain. Also explain national water policy of India.

(b) How will you describe planning for irrigation projects, its objectives and var- ious parameters.

2. (a) Explain water use efficiency, water distribution efficiency and consumptive use efficiency.

(b) An area of 300 ha is to be irrigated from a minor channel with one outlet. CCA is 80% of total area. The intensity of irrigation is 50% for rabi crop and 30% for kharif crop. Taking loss in conveyance system as 5% of outlet discharge, determine the head discharge of the channel. Take outlet discharge factor for wheat season as 1500 ha/m3/sec and for rice season as 1000 ha/m3/sec.[8+8] 3. (a) Define raingange density. Discuss the ISI norms for the raingange density.

(b) The average annual rainfall in Cm at 4 existing raingauge stations in a basin are 105, 79, 70 and 66. If the average depth of rainfall over the basin is to be estimated within 10 % error, determine the additional number of gauges needed.

4. (a) Define unit Hydrograph. What are the uses of unit hydrograph. Explain what do you understand by the principle of linearity and principle of time invariance in UH theory.

(b) Explain the factors affecting flood hydrograph.

5. (a) Describe the Theis method of determining the aquifer parameters using the pumping test data.

(b) A well with a radius of 0.5 m penetrates completely a confined aquifer of thickness 40 m and permeability 30 m/day. The well is pumped so that the water level in the well remains at 7.5 m below the original piezometric surface. Assuming that the radius of influence is 500 m, compute the steady state discharge from the well.

6. (a) What are the various investigations required for a canal project (Distribution system).Explain in brief.

(b) Explain the limitations of Kennedies theory.

7. (a) How does a diversion weir aligned. Explain the different components of a diversion weir scheme.

(b) What do you mean by a weir. What are different construction materials which may be used for weirs and how are the weirs classified on this score.

8. A weir with a vertical drop has the following particulars. Nature of bed: course sand with the value of

Bligh'sC = 12
Flood Discharge = 300 cumecs
Length of weir = 40 m
Height of weir above low water = 2 m
Height of falling shutter = 0.6 m
Top width of weir = 2.0 m
Bottom width of weir = 3.5 m
Design the length and thickness of aprons and cross section of the weir.