[01–4105]

IV/IV B.E. DEGREE EXAMINATION.

First Semester

Civil Engineering

WATER RESOURCES ENGINEERING – I

(Common with Civil Environmental Engineering)

(Effective from the admitted batch of 2006-2007)

Time : Three hours Maximum : 70 marks

Question No. 1 is compulsory.

Answer any FOUR from the remaining.

Answer all sub questions of a question at one place

All questions carry equal marks.

1. (a) Briefly explain about the orographic precipitation.

   (b) What is time of concentration and mention the formula for time of concentration?

   (c) State the differences between specific yield and specific retention.

   (d) What is a cavity type tube well?

   (e) What is a multipurpose reservoir?

8. Write short notes on any THREE of the following:

(a) Explain the method of determining evaporation using water balance method. What are its limitations'?

(b) What are the different types of aquifers?

(c) What are the various zones of storage in a reservoir, show them in a neat sketch?

(d) Explain the terms gross command area, culturable command area and Kor period.

(e) Explain the critical tractive force approach for channel design.

(f) State the advantages and disadvantages of drip irrigation system.

(g) Mention the limitations of Kennedy's silt theory.

2. (a) Explain the working of any two automatic rain gauges.

(b) The ordinater (in mm) of a rainfall mass curve for a storm which commenced at 6.30 hours recorded by a self recording rain gauge at 15 min intervals are as follows:

0, 12.4, 22.1, 35.1, 52.7, 63.7, 81.9, 109.2, 123.5, 132.6, 143.3,146 and 146

construct the hyetograph of this storm for a uniform interval of 15 minutes.

3. (a) Explain the procedure for the construction of unit Hydrograph with a neat sketch.

(b) What is S-Hydrograph and how is it constructed? What is the purpose of S-Hydrograph?

4. (a) Explain the different types of tube wells.

(b) What is the discharge of a fully penetrating into unconfined aquifer under a depression of 3 m. The tube well dia is 20 cm and the radius of influence is 250 m. The coefficient of permeability of aquifer is 60 m/day.

5. (a) What are the zones of silting in a reservoir and what are the methods used for the control of silting of reservoirs?

(b) Explain the procedure for determination of reservoir capacity for a specific demand using the mass inflow and demand curves.

6. (a) What is available soil moisture in a crop root zone? What are the methods of irrigation by controlled flooding? Explain.

(b) A water course has a culturable command area of 1200 ha. The intensity of irrigation for crop 'A' is 40% and for crop 'B' it 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 water course if the Kor depth of crop 'A' is 10 cm and for crop 'B' it is 16 cm.

7. (a) Explain the terms regime channel, initial regime and find regime. Explain the procedure applied to channel design using Lacey's silt theory.

(b) Design an irrigation channel using Kennedy's silt theory to carry a discharge of 45 cumecs. Take $n = 0.0225$ and $m = 1.05$. The channel has bed slope of 1 in 5000.