Answer all questions.

Time: Two hours

01. (a) What do you understand by the following terms.

     i. Capillary water

     ii. Field Capacity

     iii. Readily available water

     iv. Critical point and Depletion level

(b) (i) Calculate bulk density, water content on weight basis and water content on volume basis of a soil when soil core of 10 cm diameter and 8 cm length weighs 1223.5 g immediately after sampling and 992.3g after oven drying at 105°C.

(ii) An irrigation pump discharges water at the rate of 10,400 litres per hour and works seven hours each day. Estimate the area commanded by the water lift if the average depth of irrigation is 6cm and irrigation period is 14 days.

02. (a) What do you mean by the term Net Irrigation Requirement?

(b) List the advantages and disadvantages of the surface irrigation methods.

(c) A legume crop is to be irrigated using the basin method. The size of the basin is 10m x 8m. The size of the available irrigation stream is 15 l/sec. The field capacity of the soil at root zone is 16%, depth of root zone is 85cm and the bulk density of the soil is 1.52g/cm^3. Soil moisture content before irrigation is 8%. Determine the irrigation duration if the water application efficiency is 90%.

(PTO)

03. (a) Give the steps involved in the calculation of crop evapotranspiration (ETc).

(b) Briefly discuss the factors affecting the evapotranspiration.

(c) Briefly discuss the different kinds of irrigation efficiencies which are used to evaluate the effectiveness of available water supply during crop production.

04. (a) State the importance of the wetting pattern of different soil types and explain the causes for poor wetting pattern during irrigation.

(b) Write short notes
     a. Criteria for evaluation of irrigation water quality.
     b. Causes of water logging and development of high water table.