No. of Printed Pages : 3

ET-533 (A)

B.Tech. CIVIL (WATER RESOURCES ENGINEERING)

01724

Term-End Examination

June, 2011

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. Explain ***any four*** of the following : **4x3½=14**

(a) Infiltrometers

(b) Radial flow pump

(c) Drainage water disposal

(d) Sustainable development

(e) Agro climate regional planning

(f) Irrigation efficiencies

(g) Contour Bunding

2. (a) Describe in brief any four of the important irrigation and multipurpose river valley projects undertaken or completed after the independence of our country. 7

(b) Write a critical note on total impact of construction of a dam (Reservoir) on environment. 7

3. (a) The food production of India has increased due to the adoption of appropriate cropping pattern and irrigation. Give critical comments. 7

(b) Discuss in brief various climatic zones of India. 7

4. (a) Compare the advantages and disadvantages of sprinkler irrigation versus surface irrigation methods. 7

(b) A sample of 100 cm^3 soil was taken from the field and laboratory experiments on it were conducted and following data obtained : 7

(i) Weight of soil sample : 178 gm

(ii) Over dry weight of the sample : 160 gm

(iii) ρ_w : 1 gm/cm^3

(iv) ρ_s : 2.65 gm/cm^3

Compute the soil moisture contents by mass and volume basis respectively. Also, find porosity, air filled porosity and soil bulk density.

5. (a) Discuss the steps involved in land grading design. 5

(b) Counter Benching is to be carried out for a terrain with a land slope of 4%. The width of terrains could be in multiples of 2 m. The bund would have a top width of 0.5 m and side slopes of 1.5 H : 1 V. The maximum depth of irrigation water to be applied is 125 mm and the intensity of storm runoff may be taken as 230 mm. The free board for the bund may be taken as 0.2 m. Estimate a suitable step height for the terraces and suitable width. 9

6. (a) If a centrifugal pump does not deliver any water when started, what may be the probable causes and how can they be remedied. 7

(b) The cross-section of a drainage channel has a bed width of 1.75 m, a side slope of 1 : 1 and a depth of flow of 2 m. For a drainage coefficient of 12.5 mm/day/ha, compute the area that can be safely drained by this section at a bed slope of 1 in 4000 as per Manning's equation with n = 0.022. 7

7. Write short notes on ***any four*** of the following : **4x3½=14**

(a) Water Resources of India

(b) Water logging

(c) Evapotranspiration

(d) Multistage Submersible pumps

(e) Excavation Equipment

(f) Water allocation Methods