

B.Tech. Civil (Water Resources Engineering)

Term-End Examination

00898

June, 2016

ET-533(A) : IRRIGATION ENGINEERING

Time : 3 hours

Maximum Marks : 70

*Note : Attempt any **five** questions. All questions carry equal marks.*

1. Explain any **four** of the following : $4 \times 3 \frac{1}{2} = 14$
- (a) Agroclimatic regional planning
 - (b) Sustainable development
 - (c) Leaching requirement
 - (d) Classification of Indian rivers
 - (e) Aridity index
 - (f) Irrigation scheduling
 - (g) Effective rainfall
2. (a) Explain the important differences in operating characteristics of centrifugal and reciprocating pumps. 7
- (b) Explain how specific speed, as a characteristic parameter, is useful in both a centrifugal and a turbine pump. 7

3. (a) A heavy rainfall event in a catchment lasted 12 hours and a total of 55 mm of rain was recorded during this period. The direct run-off corresponding to this rainfall was 30 mm.
- (i) Calculate ϕ index. 7
- (ii) During another rainfall event in the same catchment, 20 mm of rainfall was recorded during the first 6 hours and 10 mm during the following 6 hours. Calculate the losses according to the ϕ index method [Use the calculated ϕ index from (i)]. 7
- (b) What is the potential evapotranspiration ? How does it affect the water balance ? 7
4. (a) Explain drip irrigation method. Also discuss the advantages and disadvantages of this method. 7
- (b) Discuss various climatic zones of India. 7
5. (a) Compare the advantages and disadvantages of sprinkler irrigation versus surface irrigation methods. 7
- (b) Discuss the criteria for the selection of pumps for irrigation. 7

6. Distinguish between any *four* of the following : $4 \times 3 \frac{1}{2} = 14$

- (a) Flexible and Rigid patterns of water allocation method
- (b) Border irrigation and Furrow irrigation
- (c) Hygroscopic water and Capillary water
- (d) Irrigation scheduling and Irrigation frequency
- (e) Void ratio and Soil porosity
- (f) Wilting point and Field capacity moisture content

7. (a) Explain the general design aspects of turbine pumps and also discuss specific speed as well as performance curves. 7

(b) Discuss in detail the environmental impact of construction of a dam. 7
