B.Tech. Civil (Water Resources Engineering)

Term-End Examination

June, 2017

00355

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. Use of scientific calculator is permitted. Assume any data suitably, if not given.*

1. Write brief notes on the following (up to 100 words each) :   7×2=14

    (a) Comprehensive planning

    (b) Advantage of sprinkler irrigation system

    (c) Irrigation efficiency

    (d) Types of water application methods

    (e) Various steps involved in land grading system

    (f) Classification of pumps

    (g) Impeller of centrifugal pump

2. (a) Explain various types of drainage systems with the help of neat sketches. 7

(b) Write down the names of various equipments used for land grading and explain any one of them. 7

3. (a) Describe Sardar Sarovar Rehabilitation Policy. 7

(b) Discuss the wealth of water resources in India. (300 words) 7

4. (a) Compare and contrast a turbine pump with a centrifugal pump. 7

(b) Explain about matching of pump characteristics with well characteristics. 7

5. (a) A moist soil sample has a volume of 465 cm^3, and it weighs 795 g. When it was dried in the oven its weight was 730 g. The specific gravity of the soil is 2·68. Determine porosity, moisture content, volumetric moisture content and degree of saturation of the soil sample. 10

(b) Compare and contrast different types of infiltrometers. 4

6. In an orchard (in sandy soil), trees are planted at 5 m intervals, and it is estimated to have the canopy cover of 75%. The monthly average pan evaporation is 6·3 mm/day. The pan coefficient and crop coefficient may be assumed as 0·70 and 1·15 respectively. If the coefficient of water application uniformly is 0·90, determine the number of drippers required and the number of hours they have to be operated. *14*

7. (a) Explain the need for land grading. *4*

(b) Explain sprinkler irrigation. What are the advantages of sprinkler irrigation over drip irrigation ? Also draw the necessary diagram. *10*

8. It is required to calculate the effective head and power of a drive motor for a centrifugal pump to deliver a discharge of 100 l/s, from a sump to an overhead tank, from the following data : *14*

(a) Difference of water levels in sump and overhead tank = 24·8 m

(b) Suction lift = 2·8 m

(c) Delivery head = 22·0 m

(d) Head loss in suction pipe = 1·06 m

(e) Head loss in delivery pipe line = 5·41 m

(f) Diameter of suction and delivery pipe = 250 mm