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**ET-533(A)**

# B.Tech. Civil (Water Resources Engineering)

## Term-End Examination

00102 **December, 2016**

## 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 (up to 100 words each) on the following : *7×2=14*

(a) Necessity for Irrigation

(b) Drainage Water Disposal

(c) Water Logging

(d) Disadvantages of Drip Irrigation

(e) Contour Benching

(f) Classification of Pumps

(g) Need for Land Grading

**2.** (a) Explain how specific speed, as a characteristic parameter, is useful for both the centrifugal and turbine pumps. *7*

(b) Explain the role of pumps in Irrigation Engineering. *7*

3. A wet sample of soil 1875 gm was moulded into 1000 $cm^3$. The soil was dried in an oven reaching a constant mass of 1675 gm. Its specific gravity may be taken as 2·67. Compute the following quantities : *14*

   (a) Water content by weight, volume and mass

   (b) Dry unit weight of the soil

   (c) Porosity

   (d) Void ratio

   (e) Degree of saturation

   (f) Saturated unit weight

   (g) Air-filled porosity

4. Compare and contrast between drip irrigation and sprinkler system. Also draw their diagrams. *14*

5. (a) Express 1170 ppm sodium chloride (NaCl) salt concentration in terms of meq/*l*. *4*

   (b) Write an explanatory note on irrigation water quality standards. *10*

6. (a) Explain the principles of working of a centrifugal pump. *10*

   (b) Write down the difference in operating characteristics of centrifugal and reciprocating pumps. *4*

7. Explain the four-corner method for the calculation of cut and fill volumes. *14*

8. (a) Name the various types of water application methods and explain any one of them in detail. *7*

(b) A 300 m long sprinkler lateral discharge is 500 *l*/minute. The spacing between the laterals is 15 m. Determine the average application rate of sprinkler laterals. *7*

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