DIPLOMA IN CIVIL ENGINEERING
DCLE(G)

Term-End Examination

December, 2019

005541

BCE-061 : IRRIGATION ENGINEERING

Time : 2 hours   *Maximum Marks : 70*

*Note : Question no. 1 is **compulsory**. Attempt any **four** more questions from the remaining questions. Use of scientific calculator is permitted.*

1. Select the most appropriate answer from the given options.   *7×2=14*

   (a) Sugarcane is a/an

      (i) Kharif crop

      (ii) Rabi crop

      (iii) Annual crop

      (iv) Eight-monthly crop

(b) The flow velocity is given by Darcy's law which is expressed as

(i) $V = \dfrac{K}{I}$

(ii) $VK = I$

(iii) $V = KI$

(iv) None of the above

(c) The relationship between duty and delta is given by

(i) $\Delta = 8{\cdot}64 \dfrac{B}{D}$

(ii) $\Delta = 8{\cdot}64 \dfrac{D}{B}$

(iii) $\Delta = 8{\cdot}64\,(B + D)$

(iv) $\Delta = 8{\cdot}64\,(B - D)$

(d) In design of an unlined canal, Lacey's formula includes an additional factor known as

(i) silt factor

(ii) sand factor

(iii) clay factor

(iv) gravel factor

(e) Which of the following is *not* a hydraulic structure ?

(i) Drop and fall

(ii) Cross regulator

(iii) Grass waterway

(iv) Escape

(f) French drain is an example of

    (i) shallow surface drain

    (ii) deep surface drain

    (iii) shallow subsurface drain

    (iv) deep subsurface drain

(g) If the water applied to a field penetrates uniformly throughout, then the water distribution efficiency is

    (i) zero

    (ii) 0·5

    (iii) 1·0

    (iv) 1·5

2. (a) Explain the construction of Symon's Rain Gauge with the help of a neat sketch.   7

  (b) A drainage basin having an area of 10,000 km^2 is located in North Indian plains. Estimate the maximum flood discharge from the basin. (Use Dicken's formula, C = 6)   7

3. (a) What are the functions of Irrigation water ? Write the factors on which the total water requirement of a crop depends.   8

  (b) Write the differences between Net Irrigation Requirement and Gross Irrigation Requirement with required expression.   6

4. What are the different methods of irrigation ? Compare the suitability of use of any two such methods. *14*

5. (a) Differentiate between a shallow well and a deep well. Calculate the discharge from an unconfined well of 0·30 m diameter, if the draw-down inside the well is 3 m and saturated thickness of aquifer is 15 m. The permeability of aquifer is 1·5 m/hr and radius of influence is 600 m. *7*

   (b) What are the methods of drilling a well ? Explain any one in detail. *7*

6. Enlist the names of various types of dams. Compare the merits and demerits of any two types. *14*

7. (a) What are the different types of Canal Linings ? Explain the steps of construction of any one of them. *7*

   (b) Write short notes on any *two* of the following : $2 \times 3 \frac{1}{2} = 7$

      (i) Major causes of waterlogging

      (ii) SAR value of irrigation water

      (iii) Canal components