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BCE-061

DIPLOMA IN CIVIL ENGINEERING
DCLE(G)

Term-End Examination

00937 **December, 2017**

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) Major rabi crop(s) is/are

(i) Wheat

(ii) Sugarcane

(iii) Rice

(iv) All of the above

(b) Weighing bucket gauge is a

(i) Non-recording rain gauge

(ii) Self-recording gauge

(iii) Electrically operated gauge

(iv) None of these

(c) The total depth of water required by a crop during the entire period of the crop in the field is known as

(i) Duty
(ii) Base period
(iii) Delta
(iv) Command area

(d) The silt factor f is correlated to the silt grade m (in mm) by the relation

(i) $f = 1{\cdot}76 / \sqrt{m}$
(ii) $f = 1{\cdot}76 + \sqrt{m}$
(iii) $f = 1{\cdot}76 - \sqrt{m}$
(iv) $f = 1{\cdot}76 \sqrt{m}$

(e) _____ is a formation which is neither porous nor permeable.

(i) Aquifer
(ii) Aquitard
(iii) Aquiclude
(iv) None of these

(f) When the value of SAR lies between 10 to 18, it is called

(i) Low Sodium Water
(ii) High Sodium Water
(iii) Very High Sodium Water
(iv) None of these

(g) An artificial obstruction placed in a river or water course to increase the depth of water is

(i) Barrage
(ii) Sluice
(iii) Dam
(iv) Spillways

2. (a) What are the advantages of lining of canals ? 4

(b) Enumerate various types of linings. Explain the construction of cement concrete lining and shotcrete lining. 10

3. (a) What are the functions of canal outlets ? What are the requirements of a good outlet ? 8

(b) Differentiate between weir and barrage in detail. 6

4. (a) Discuss the characteristics of unconfined and confined aquifers with suitable neat sketches. 10

(b) What is Darcy's law ? Discuss the assumptions made. 4

5. (a) Calculate the discharge from a fully penetrating confined well of 300 mm diameter, if the thickness of the aquifer is 20 m, drawdown is 5 m, permeability of the aquifer is 20 mm/min and the radius of influence is 450 metres. 6

(b) Discuss Rotary Drilling method with a neat sketch. 8

6. (a) Discuss the factors affecting the selection of an irrigation system. 6

(b) Furrows 90 m long and spaced 75 cm apart are irrigated by an initial furrow stream of two litres/second. The initial furrow stream reached the lower end of the field in 50 minutes. The size of the stream was then reduced to 0·5 litres/second. The cut back stream continued for 1 hour. Estimate the average depth of irrigation. 8

7. Write short notes on any ***four*** of the following : $4 \times 3\frac{1}{2} = 14$

(a) Sprinkler Irrigation

(b) Fertigation

(c) Drainage Coefficient

(d) French Drain

(e) Hydrologic Cycle

(f) Jet Pump