01 : For an irrigated field having field capacity = 30%, Permanent wilting point = 10%, Permissible depletion of available moisture = 40%, Dry weight of soil = 14·70 kN/m³ Unit weight of water = 9.8 kN/m³ and Effective rainfall = 30 mm, what is the net irrigation requirement per meter depth of soil?

(a) 300 mm
(b) 150 mm
(c) 120 mm
(d) 90 mm

02 : A rice crop is to be irrigated in a field covering an area of 2400 ha, the duty and base period of rice are given as 860 ha/cumec and 120 days respectively. The volume of water required in the field is nearly :

(a) 500 ha-m
(b) 1400 ha-m
(c) 2000 ha-m
(d) 2880 ha-m

03 : An identified source of irrigation water has ion concentrations of Na", Ca+² and Mg+2 as 20, 10 and 8 mili equivalents per litre, respectively. The SAR of this water is approximately

(a) 2.06
(b) 6.67
(c) 2.67
(d) Zero

04 : Match List-I with List-II and select the correct answer (s = bed slope, q = discharge intensity, Q = discharge) :

List – I	List – II
A. Mean velocity in a Lacey regime channel	1. $S^{1/3}$
B. Mean velocity in a lined channel	2. $Q^{2}l^{3}$
C. Normal scour depth in an alluvial channel	3. $S^{-1/3}$
D. Wetted perimeter of a Lacey regime channel	4. $Q^{1/2}$

A. $S^{1/2}$ (under A item 1)

Codes
A. A – 2, B – 5, C – 3, D – 1
B. A – 3, B – 1, C – 4, D – 5
C. A – 2, B – 1, C – 3, D – 5
D. A – 3, B – 5, C – 4, D – 1

05 : Consider the following terms relating to irrigation requirements

1. Consumptive irrigation requirement
2. Net irrigation requirement
3. Field irrigation requirement
4. Gross irrigation requirement

For a given set up, which one of the following is the correct relation?

(a) 1 > 2 > 3 > 4
(b) 1 < 2 < 3 < 4
(c) (1 = 2) < 3 < 4
(d) 1 < (2 = 3) < 4

06 : A field measures 40 hectares. When 8 cumecs of water was supplied for 6 hours, 30 cm of water was stored in the root zone. The field application efficiency is nearly

(a) 70%
(b) 80%
(c) 85%
(d) 90%

07 : Consumptive Use refers to the loss of water /as a result of

(a) Evaporation and Transpiration
(b) Crop Water Requirement
(c) Evaporation and Infiltration
(d) Evaporation and Transpiration from the cropped area

08 : The spacing of tile drains to relieve waterlogged land is directly proportional to the

(a) Depth of drain below the ground surface
(b) Depth of impervious strata from the drain
(c) Depth of drain below the water level
(d) Coefficient of permeability of the soil to be drained

09. Acidic soils are reclaimed by

(a) leaching of the soil
(b) using limestone as a soil amendment
(c) using gypsum as a soil amendment
(d) provision of drainage

10. Leaching is a process

(a) By which alkali salts present in the soil are dissolved and drained away
(b) By which alkali salts in soil come up with water
(c) Of draining excess water of irrigation
(d) Which controls water logging

11. In the alignment of an irrigation channel where off-takes have to be provided at regular intervals, changes in the given channel parameters are made use of. The correct sequence of the decreasing order of preference of these parameters is

(a) width, slope, depth
(b) width, depth, slope
(c) depth, slope, width
(d) depth, width, slope

12. For medium silt whose average grain size is 0.16 mm, Lacey's silt factor is likely to be

(a) 0.30
(b) 0.45
(c) 0.70
(d) 1.32

13. In order to ensure that no scouring takes place in the bed of a channel of bed slope 'S' constructed on alluvial soil of particle size 'd' cm, the flow velocity should be restricted to

(a) $4.85\ d^{1/2}\ S^{-1/6}$
(b) $4.85\ d^{-1/2}\ S^{1/6}$
(c) $0.48\ d^{1/2}\ S^{1/6}$
(d) $0.48\ d^{1/2}\ S^{-1/6}$
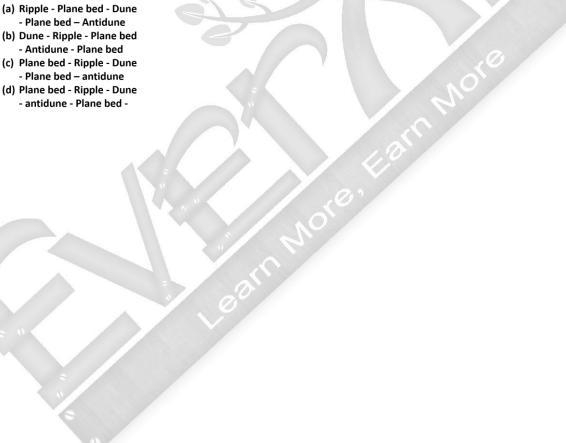
14. Consider the following: Garret's diagram for the design of irrigation channel is based on

1. Kennedy's theory
2. Lacey's theory
3. Kutter's formula
4. Manning's formula

Which of these are correct?

(a) 1 and 3
(b) 1 and 4
(c) 2 and 3
(d) 2 and 4

15. Which one of the following is the correct sequence in the increasing order the Froude number of flow assumed by the bed form of an alluvial stream with movable bed material?

(a) Ripple - Plane bed - Dune - Plane bed – Antidune
(b) Dune - Ripple - Plane bed - Antidune - Plane bed
(c) Plane bed - Ripple - Dune - Plane bed – antidune
(d) Plane bed - Ripple - Dune - antidune - Plane bed -