

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(MID SEMESTER EXAMINATION)**

**CLASS: BE  
BRANCH: CIVIL**

**SEMESTER: VII  
SESSION : MO/2018**

**SUBJECT : CE7003 : IRRIGATION ENGINEERING AND HYDROLOGY**

**TIME: 1.5 HOURS**

**FULL MARKS: 25**

**INSTRUCTIONS:**

1. The total marks of the questions are 30.
  2. Candidates may attempt for all 30 marks.
  3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. The missing data, if any, may be assumed suitably.
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- Q1 (a) What are the disadvantages of irrigation? [2]  
(b) Define the following: [3]  
(i) hygroscopic water, (ii) capillary water, and (iii) gravitational water.
- Q2 (a) Describe briefly the sprinkler irrigation method. [2]  
(b) After how many days will you supply water to soil in order to ensure efficient irrigation of [3]  
the given crop if,  
Field capacity = 27 %  
Permanent wilting point = 14 %  
Dry density of soil = 1.5 g/cm<sup>3</sup>  
Root zone depth = 75 cm  
Daily consumptive use of water for the given crop = 11 mm
- Q3 (a) Differentiate between crop period and base period. [2]  
(b) What are the factors that affect consumptive use of water? [3]
- Q4 (a) Explain the direct method of estimation of consumptive use by tanks and lysimeters. [2]  
(b) An irrigation canal has gross command area of 80,000 hect, out of which 85 % is culturable [3]  
irrigable. The intensity of irrigation for kharif season is 30 % and that for rabi season is 60  
%. Find the discharge required at the head of the canal if the duty at its head is 800  
hect/cumec for kharif season and 1700 hect/cumec for rabi season.
- Q5 (a) Define initial regime and final regime of alluvial canals. [2]  
(b) Design an irrigation canal to carry a discharge of 45 cumec. Assume  $N = 0.0225$  and  $m = 1$ . [3]  
The channel has a bed slope of 0.16 m per km.
- Q6 (a) What are Lacey's fundamental equations? [2]  
(b) Explain the steps to be followed for design of alluvial canals using Lacey's method. [3]