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

CLASS: BE **SEMESTER: VII**
BRANCH: CIVIL **SESSION : MO/2019**

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.

Q1 (a) Differentiate between direct irrigation and storage irrigation. [2]
(b) With the help of a sketch, explain the following. [3]
(i) hygroscopic water, (ii) capillary water, and (iii) gravitational water

Q2 (a) What are the advantages of furrow method of irrigation? [2]
(b) After how many days will you supply water to soil in order to ensure efficient irrigation of the given crop if, [3]
Field capacity = 27 %
Permanent wilting point = 14 %
Dry density of soil = 1.5 g/cm^3
Root zone depth = 75 cm
Daily consumptive use of water for the given crop = 11 mm

Q3 (a) Explain the concept of kor depth and kor period. [2]
(b) What are the factors that affect duty? [3]

Q4 (a) Explain the direct method of measurement of consumptive use by using tanks and lysimeters. [2]
(b) An irrigation canal has gross command area of 80,000 hect, out of which 85 % is culturable 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. [3]

Q5 (a) Discuss briefly the following types of canals. [2]
(i) main canal, (ii) branch canal, (iii) major distributary, (iv) minor, and (v) water course
(b) Using Kennedy's method, design an irrigation canal to carry a discharge of 45 cumecs. Assume N = 0.0225 and m = 1. The channel has a bed slope of 0.16 m per km. [3]

Q6 (a) Using the Lacey's fundamental equations, derive a relationship between wetted perimeter and discharge. [2]
(b) Using Lacey's method, design an alluvial canal for Q = 30 cumecs, f = 1.0. Assume side slope as $\frac{1}{2}:1$. [3]

:::: 20/09/2019M ::::::