Reg. No.										

GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR
(GIET UNIVERSITY)

B. Sc. (Ag.) (Fourth Semester) Examinations, April – 2025

AG(E

AG(E)-221 – Water Management

Time: 2 hrs Maximum : 50 Marks

The figures in the right hand margin indicate marks.

PART – A

Q.1. Fill in the blanks with suitable word / figure. (0.5 x 10 = 5 Marks)

a. "Per Drop More Crop" was launched under _____ scheme/yojana.
b. The moisture content at a given suction is greater in desorption than in sorption, this phenomenon is known as _____.
c. Infiltration rate of water in tropical condition is _____ as compared to temperate under comparable soil moisture conditions.
d. International Water Management Institute is located in_____.
e. The area that can be irrigated under a discharge of 1 cumec during the base period is known as _____..
f. Crop coefficient (Kc) is the ratio between _____.
g. IW/CPE = 1.0 for crop A, IW/CPE = 0.5 for crop B, then irrigation interval will be more for_____ crop.
h. Irrigation water which contains _____ ppm boron (B) is not suitable for crops.
i. Soil-Plant-Atmosphere-Continuum (SPAC) is maintained as long as the atmospheric water potential is _____ as compared to soil water potential.
j. According to Poiseuille's the rate of flow of water is directly proportional to the _____ power of radius.

Q. 2. Define the following in one or two sentences. (1 x 5 = 5 Marks)

a. PET
b. Drainage coefficient
c. Consumptive use
d. WUE
e. Virtual water

Q3. Match the following (0.5 x 10 = 5 Marks)

Column – A		Column – B	
(a)	cusec	(i)	Clay soil
(b)	Low duty	(ii)	Crop ET
(c)	cumec	(iii)	1000 lit/sec
(d)	Kor watering	(iv)	1st watering before sowing
(e)	Palco	(v)	1st watering after sowing
(f)	High duty	(vi)	IR Thermometer
(g)	Tensiometer	(vii)	Sandy soil
(h)	Mole Drainage	(viii)	Rice
(i)	SDD	(ix)	sugarcane
(j)	Lysimeter	(x)	ft^3/sec

Q4. Write True or False against each statement **(0.5 x 10 = 5 Marks)**

a. World Water Day celebrated on 22nd of March every year.

b. IR= WR+ER-S

c. The relationship between ET and crop yield is quadratic in case of moong bean.

d. Lysimeter is used to determine the actual evapotranspiration in field condition.

e. Soil-cum-sand Miniplot technique is a sophisticated method of scheduling irrigation.

f. 1 ha-cm of water is 10000 litre.

g. Renner gave the Theory of Active and Passive absorption of water.

h. In rice field the major water loss through is percolation.

i. Grand growth phase the most critical stage of irrigation for sugarcane.

j. Joule/kg, N/m^2 are the unit of soil water potential.

PART – B

Attempt *ANY FIVE* questions. All question carries equal marks **(6 x 5 = 30 Marks)**

5. (a) Explain the phases of surface irrigation with graph. (3)

   (b) The boron content in irrigation water is 2 ppm. The depth of water is 50 mm and total 8 number of irrigations is given for maize crop. Calculate the amount of boron accumulated for an area of 1 ha. (3)

6. (a) What is water use efficiency. Discuss in brief regarding the agronomic practices which leads to improve the water use efficiency. (4)

   (b) What is application efficiency and storage efficiency. (2)

7. (a) What is scheduling of irrigation. Briefly describe regarding soil moisture depletion approach. (4)

   (b). A wheat crop with duration of 110 days requires 50 cm of irrigation water. How much area can be irrigated with flow of 20 lps for 10 hours in a day. (2)

8. (a) What is yield response factor. (1)

   (b) A water surface received 15 MJ/m^2 of solar radiation. 80 % of solar radiation is used for evaporation of water. Then what is the depth of water in milli meter is vapourised? (5)

9. (a) What is Darcy's law, briefly explain. What is its limitation. (4)

   (b) Difference between saturated and unsaturated flow of water. (2)

10. (a) What are the limitations in "Theories of water availability". (2)

    (b) Given, soil moisture content at FC = 25 cm/m depth, moisture content before irrigation = 13 cm/m depth, BD = 1.3 g/cc, Effective root depth = 60 cm, irrigation efficiency = 70 % and ET loss = 3 mm/day. Calculate the Gross irrigation requirement (GIR), Net irrigation requirement (NIR) and irrigation interval. (4)

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