SEAT No. :

PA-10161

[Total No. of Pages : 2

[6010]- 30

B.E. (Civil Engineering) (Insem)
IRRIGATION AND DRAINAGE
(2019 Pattern) (Semester - VIII) (401013C) (Elective - V)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:
1) *Solve Q.1 or Q.2, Q.3 or Q.4.*
2) *Figures to the right indicate full marks.*
3) *Assume suitable data, if necessary.*

Q1) a) Define irrigation and explain its necessity in a tropical country like India. What are the advantages of irrigation? **[6]**

b) Explain following water distribution techniques in farms: **[6]**
   i) furrow irrigation
   ii) check flooding,
   iii) basin flooding

c) Define **[3]**
   i) gross command area
   ii) culturable command area
   iii) intensity of irrigation

OR

Q2) a) Explain piped distribution network (PDN) with neat sketch. **[5]**

b) Discuss advantages and disadvantages of sprinkler irrigation. **[5]**

c) Explain factors affecting the choice of irrigation methods. **[5]**

Q3) a) Estimate the potential evapotranspiration (PET) of an area for the month July and August in which rice is grown. The latitude of the area is 12°N. The average value of crop coefficient K = 1.10 in Blaney-Criddle formula. The mean monthly temperature for the month July and August is 82°F (27.78°C) and 80°F (26.67°C). Use Table (3a) to calculate monthly daytime hours percentage. **[8]**

Table 3a: Monthly daytime hours percentage, Ph, for use in Blaney-Criddle formula

North latitude (deg)	July	August
0	8.50	8.49
10	8.86	8.71
15	9.05	8.83
20	9.25	8.96

b) Explain direct method of measurement of evapotranspiration using lysimeter. **[4]**

c) Discss the significance of soil structure in irrigation engineering. **[3]**

OR

Q4) a) Explain step by step procedure for estimating reference crop evapotranspiration using FAO Penman-Monteith equation. **[7]**

b) Estimate the potential evapotranspiration (PET) of an area for the month Oct in which sugarcane is grown. The latitude of the area is 12°N. Use Thornthwaite formula. The mean monthly air temperature in °C is as given below: **[8]**

Month	Mean monthly air temperature (°C)
Jan	19.9
Feb	20.8
Mar	23.1
Apr	27.3
May	32.5
June	29.4
July	27.9
Agu	26.3
Sept	26.0
Oct	23.9
Nov	21.1
Dec	20.2

An empirical constant 'a' in Thornthwaite formula is given by:

$$a = 6.75 \times 10^{-7} \, I_t^3 - 7.71 \times 10^{-5} \, I_t^2 + 1.792 \times 10^{-2} \, I_t + 0.49239$$

where, I_t = the total of 12 monthly values of heat index.

Use Table (4a) to calculate Adjustment factor for number of hours of daylight and days in the month in Thornthwaite formula.

Table 4a: Adjustment factor in Thornthwaite formula

North latitude (deg)	Oct
0	1.04
10	1.02
15	1.01
20	1.00

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