

AGRICULTURAL & FOOD ENGINEERING DEPARTMENT
INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR 721 302
MID-SEMESTER EXAMINATION

Date of Examination: / 9 / 10 Autumn Semester

Full Marks: 40

B.Tech (H): 2nd Year

Subject: **Crop Production Technology**

Subject No. **AG 20101 (3-0-0=3)**

No. of students:47

Instructions: Marks allotted are in parentheses

1. (a) Enlist the qualities of a good seed.
(b) What happens when an inferior quality seed is used in cultivation of crop?
(c) Enumerate the factors which influence sowing method.

[1+1+2=4]
2. (a) What is tillth? Why is it important in cultivation of crop?
(b) Define minimum tillage and state the difference between minimum tillage and conventional tillage.
(c) Enlist the advantage and disadvantages of minimum tillage.

[1+2+1=4]
3. (a) State the criteria of essentiality of nutrients. Enlist essential micronutrients in crop production.
(b) Elaborate the role of nitrogen and magnesium in crop growth and development.
(c) Calculate the fertilizer requirement and its timing of application for sweet corn which is required to be supplied with 120 kg N, 80 kg P₂O₅, and 40 kg K₂O/ha through Suphala, Single Super Phosphate and Urea. What are the measures to be taken for increasing fertilizer use efficiency?

[1+1+5=7]
4. State five basic principles of irrigation. With suitable diagram, describe different methods of irrigation. Write the approaches for increasing water use efficiency. Calculate the time required to irrigate four acres of sugarcane when soil moisture deficit is 2 inch, discharge from a weir is 2 cusec and irrigation efficiency is 70%.

[5]
5. Write short notes on the followings.
(a) Band placement, (b) Vermicomposting, (c) Field capacity, (d) Rhizosphere, and (e) Fertigation

[5]

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6. (a) Explain the growth pattern and development phases of an annual crop.
(b) Explain the growth laws of Liebig and Mitscherlich.
(c) State the four major factors which influence crop growth and development.

[2+2+1=5]

7. (a) What is length of growing season? With example, explain the method of calculation of length of growing season of a particular location.
(b) The rice cultivar 'IR 36' requires 420 °Cdays as growing degree days for completion of the grain filling phase (Flowering to maturity). The crop received average daily maximum- and minimum-temperature of 35 °C and 20 °C, respectively during the grain filling phase. Mean daily temperature of less than 8 °C was observed for 3 days during this growth phase. Calculate the number of days required by the cultivar for completion of the grain filling stage. (Assumption: Base temperature of the crop = 9 °C)
(c) Wheat crop dry biomass of 50 and 90 g/m² was recorded at 20 and 35 days after emergence of the crop. Calculate the Crop Growth Rate and Relative Growth Rate during the observation period.

[2+2+1=5]

8. (a) Describe intercropping, relay cropping, ratoon cropping and sequential cropping system with suitable example.
(b) State the principles of intercropping system.
(c) Explain two formulae for assessment of yield advantage in intercropping system.

[2+1+2=5]