

- (v) Derive relationship between duty and delta.
- (vi) Differentiate between weir and barrage.
- (vii) What are the merits and demerits of subsurface irrigation ?
- (viii) Find the duty for crop when delta is 120 cm on field and base period for crop is 120 days.
- (ix) What are types of galleries and their function in gravity dam ?
- (x) Determine factor of safety against sliding in the gravity dam.

Roll No.

Total Pages : 04

J-21-0123

B. Tech. EXAMINATION, 2021

Semester VII (CBCS)

IRRIGATION AND DESIGN OF HYDRAULIC
STRUCTURES

CE-703

Time : 2 Hours

Maximum Marks : 60

The candidates shall limit their answers precisely within 20 pages only (A4 size sheets/assignment sheets), no extra sheet allowed. The candidates should write only on one side of the page and the back side of the page should remain blank. Only blue ball pen is admissible.

Note : Attempt *Four* questions in all, selecting *one* question from any of the Sections A, B, C and D. Q. No. 9 is compulsory. Assume missing data, if any.

Section A

1. Explain the "Border flooding". How does it differ from "check flooding" and "free flooding" ? 15

2. (a) Describe the sprinkler irrigation system and its advantages. What are the favourable conditions for adopting this method of irrigation ? **10**
- (b) Discuss about the impurities due to soluble salt in irrigation water. **5**

Section B

3. (a) Discuss about the factors affecting duty in irrigation field. **8**
- (b) What is Net irrigation requirement (NIR) ? Discuss the Blaney-Criddle formula for estimation of consumptive use. **7**
4. Define consumptive use. How is consumptive use related to total requirement of water for the crop ? **15**

Section C

5. What are the modes for failure of gravity dam ? Explain in detail. **15**
6. Describe different types of spillways with neat sketches. **15**

Section D

7. What are the functions of head regulator ? Explain the design procedure of canal head regulator. **15**
8. Design a straight flumed meter glaciis fall with the following data : **15**
- | | |
|---------------------------------------|--------------|
| Full supply discharge of canal | = 12 cumecs. |
| Bed level of the canal upstream | = 107.5 m |
| Bed level of the canal downstream | = 106.0 m |
| Drop (H_L) | = 1.5 m |
| FSL of canal upstream | = 109.7 m |
| FSL of canal downstream | = 108.2 m |
| Bed width of canal u/s and d/s | = 60 m |
| Safe exit gradient for canal material | = 1/5.5 |

(Compulsory Question)

9. Answer the following : **10×1.5=15**
- (i) Define field capacity and permanent wilting point.
- (ii) Differentiate between head sluices and scouring sluices.
- (iii) What is optimum use of water ?
- (iv) What are the functions of canal head regulators ?