

C 3111

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Fifth Semester

(Regulation 2004)

Civil Engineering

CE 1301 — IRRIGATION ENGINEERING

(Common to B.E. (Part-Time) Fourth Semester Regulation 2005)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the disadvantages of irrigation?
2. Define Saturation capacity and wilting point.
3. Give examples for surface and sub-surface irrigation systems, which are in common use.
4. State the site conditions in which drip irrigation is recommended to be adopted.
5. What is the difference between a 'weir' and a 'dam'?
6. How 'spillways' are classified? State their respective functions.
7. What is a 'canal drop'? Why is it necessary?
8. State the various types of 'cross-drainage works'.
9. What is meant by 'participatory irrigation management'?
10. What is meant by 'on-farm' development?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Define Duty, Delta and base period. (3)
(ii) What is the relationship between duty, delta and base period? (2)
(iii) List the principal factors (any five) which affect the duty of a canal system and the methods to improve the duty (any six only). (5 + 6 = 11)

Or

- (b) (i) What are the various (i.e. six) types of irrigation efficiencies recognised? How they are expressed? (6 + 6 = 12)
(ii) Define Consumptive use. State any four factors which affect consumptive use of water. (2 + 2 = 4)
12. (a) (i) State the advantages and disadvantages of sub-soil irrigation. (6 + 3 = 9)
(ii) Find the time required to irrigate a border of 150 m long and 10 m wide with a stream of 25 litres/sec. The irrigation is applied at 50% soil water availability. The depth of root zone is 75 cm and bulk density of the soil is 1.52 g/cm³. Assume the available water holding capacity of the soil as 18%. (7)

Or

- (b) (i) State the various advantages and limitations of 'drip irrigation'. (6 + 2 = 8)
(ii) Explain with suitable sketches the border and check methods of irrigation. (4 + 4 = 8)
13. (a) (i) State how dams are classified and list the various types of dams there under. (3 + 6 = 9)
(ii) What are the various factors which govern the selection of a typical dam? (7)

Or

- (b) (i) What are the various factors which affect the design of a spillway? List them. (3 + 5 = 8)
(ii) What are the three major components of a spillway? (3)
(iii) Explain 'ogee spillway' and 'syphon spillway' with reference to their importance etc. (5)

14. (a) (i) What are the different classes into which canal falls have been classified? List them. (3 + 5 = 8)
- (ii) State the recommendations for the selection of type of canal falls. (3)
- (iii) State the methods of river training. (any six only) (5)

Or

- (b) (i) State the situations under which an aqueduct, super passage, level crossing and inlet and outlet cross drainage works are adopted. (4 × 2 = 8)
- (ii) List the various features of the design of cross-drainage works from hydraulic and structural design considerations. (5 + 3 = 8)
15. (a) (i) What is meant by 'percolation ponds'? Draw a neat sketch of a percolation pond. (2 + 6 = 8)
- (ii) What are the various steps adopted to minimise the water losses due to irrigation? (8)

Or

- (b) (i) What is the need for water users' association? Explain. (8)
- (ii) What is the need for optimisation of water use? (8)
-