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Question Paper Code: U5A01

B.E./B.Tech. DEGREE EXAMINATION, NOV 2023

Fifth Semester

Agricultural Engineering

21UAG501 – IRRIGATION AND DRAINAGE ENGINEERING

(Regulations 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Optimum depth of kor watering for rice is CO1-U
(a) 135 mm (b) 165 mm (c) 190mm (d) 215mm
- Δ is the depth of water in metres, B is the number of days of base period and D is the duty in hectare/cumec, the relationship which holds good, is CO1-U
(a) $D = \Delta (8.64 D/B)$ (b) $B = \Delta (8.64 B/D)$ (c) $D = (8.6 \Delta/B)$ (d) $\Delta = (8.6 B/D)$
- As per Lacey's theory the silt factor is CO1-U
(a) directly proportional to average particle size
(b) inversely proportional to average particle size
(c) directly proportional to square root of average particle size
(d) not related to average particle size
- Which of the following method of applying water may be used on rolling land? CO1-U
(a) Boarder flooding (b) check flooding (c) furrow flooding (d) free flooding
- Which of the following spillways is least suitable for an earthen dam? CO1-U
(a) ogee spillway (b) chute spillway (c) side channel spillway (d) shaft spillway

6. The main function of a divide wall is to CO1-U
 (a) control the silt entry in the canal
 (b) prevent river floods from entering the canal
 (c) separate the under sluices from weir proper
 (d) provide smooth flow at sufficient low velocity
7. Canals taken off from ice-fed perennial rivers, are known CO1-U
 (a) permanent canals (b) Rigid canals (c) perennial canals (d) Inundation canals
8. When a canal and a drainage approach each other at the same level, the structure so provided, is CO1-U
 (a) An aqueduct (b) A syphon (c) A level crossing (d) Inlet and outlet
9. How can tile drainage help to increase crop yields? CO1-U
 (a) Increases Free Gravity Water (b) Increases Volume of Soil
 (c) Decrease Air Circulation (d) Increases Water Table Level
10. The field measurement of infiltration is done by _____ CO1-U
 (a) potentiometer (b) lysimeter (c) Infiltrometer (d) Tensiometer

PART – B (5 x 2= 10Marks)

11. Write the duty, delta and base period relation CO1 -U
12. Compare weir and dam (barrage) CO1 -U
13. What are the factors affecting the selection of type of a dam. CO1 -U
14. What are the classifications of canals based on nature of source of supply? CO1 -U
15. Draw the layout of tile drainage system CO1 -U

PART – C (5 x 16= 80Marks)

16. (a) A stream of 135 litres per second was diverted from a canal and 100 litres per second were delivered to the field. An area of 1.6 hectares was irrigated in 8 hours. The effective depth of root zone was 1.8 m. the runoff loss in the field was 432 cu.m. The depth of water penetration varied linearly from 1.8 m at the head end of the field to 1.2 m at the tail end. Available moisture holding capacity of the soil is 20 cm per meter depth of soil. Determine the water conveyance efficiency, water application efficiency, water storage efficiency and water distribution efficiency. Irrigation was started at a moisture extraction level of 50 percent of the available moisture. CO2- App (16)

Or

- (b) Briefly discuss about water resources in India and Tamilnadu. CO1-U (16)
17. (a) Explain in detail about surface and sub-surface method of irrigation CO1-U (16)
- Or
- (b) Explain in detail about erodible and non-erodible canal design theories CO1-U (16)
18. (a) Explain the design procedure for gravity dam, arch dam & earthen dam CO1-U (16)
- Or
- (b) Classify types of dams and list the comparative merits and demerits of various types of dams. CO1-U (16)
19. (a) Explain in detail about the canal outlet. CO1-U (16)
- Or
- (b) How canals are generally classified? Describe them briefly. CO1-U (16)
20. (a) Explain in detail about mole drain method. CO1-U (16)
- Or
- (b) Explain in detail about different types of pipe materials used in agriculture drainage. CO1-U (16)

