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Question Paper Code: R5A01

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2025

Fifth Semester

Agricultural Engineering

R21UAG501– IRRIGATION AND DRAINAGE ENGINEERING

(Regulations R2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which crop in India has maximum area under irrigation? CO1-U
(a) Rice (b) Wheat (c) Cotton (d) Maize
2. The amount of irrigation water required to meet the evapotranspiration needs of the crop during its full growth is called CO1-U
(a) effective rainfall (b) consumptive use
(c) consumptive irrigation requirement (d) net irrigation requirement
3. Sprinkler irrigation method was started in CO1-U
(a)1900 (b)1990 (c)1982 (d)1920
4. 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
5. The major resisting force in a gravity dam is CO1-U
(a) water pressure (b) wave pressure (c) self-weight of dam (d) uplift pressure
6. The only modern dam among the following, which has failed, is CO1-U
(a) Koyna dam in India (b) Vega de Tera dam in Spain
(c) Mauvoisin dam in Switzerland (d) Trinity dam in California, USA.

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. The canal fall involving parabolic glacis is called CO1-U
 (a) straight glacis fall (b) glacis fall (c) Inglis fall (d) Montague fall
9. Mole drainage is suitable for _____ CO1-U
 (a) sandy soil (b) Loamy soil
 (c) Clay soil (d) All the above
10. 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

PART – B (5 x 2= 10 Marks)

11. Find the delta for a crop when its duty is 864 hectares/cumec on the field. The CO2-App
 base period of this crop is 180 days.
12. Classify types of dams and list the comparative merits and demerits of CO1-U
 various types of dams.
13. What are the factors affecting the selection of type of a dam? CO1-U
14. What is cross drainage work? CO1-U
15. Draw the layout of tile drainage system CO1-U

PART – C (5 x 16= 80 Marks)

16. (a) Compute the duty and delta for a given crop using suitable field CO2-App (16)
 data.

Or

- (b) Determine the Consumptive use (C_u) and Gross irrigation CO2-App (16)
 requirement (GIR) for wheat crop from the following data:

Period of growth 1 nov to 15 march (135 days) η_a and $\eta_c = 0.85$

Dates & period of growth	Pan Evaporation E_p	Consumptive use coefficient K	Effective rainfall R_e
Nov 1-30	15	0.16	0.4
Dec 1-31	12.8	0.46	1.6
Jan 1-31	9.4	0.73	3.2
Feb 1-28	15.4	0.90	2.2
March 1-15	10.1	0.6	-

17. (a) Suggest the most suitable method of irrigation for a farm with sandy loam soil and moderate slope. Compare surface and subsurface irrigation methods, highlighting design considerations, advantages, and limitations. CO2-App (16)
- Or
- (b) Explore and Explain in detail about sprinkler method of irrigation and how far it is Suitable in Indian conditions. CO2-App (16)
18. (a) Design a suitable headwork layout for a diversion scheme that ensures efficient water diversion and effective sediment control. CO3-App (16)
- Or
- (b) Evaluate the factors influencing the location of a dam site and recommend the most suitable site conditions. CO2-App (16)
19. (a) Design a suitable canal section for a distributary carrying 10 m³/s discharge in alluvial soil using irrigation canal design principles CO3-App (16)
- Or
- (b) Suggest suitable On-Farm Development works for a canal command and explain how they improve irrigation efficiency and crop productivity. CO2-App (16)
20. (a) How would you determine the drainage coefficient for a field and use it to plan a proper drainage system? CO5-Ana (16)
- Or
- (b) Propose strategies for recycling drainage water in irrigation to improve water use efficiency. CO5-Ana (16)

