

B.E. Civil Engineering (Model Curriculum) Sem-VII  
**PCC-2 - CE-702 : Irrigation Engineering**

P. Pages : 2

Time : Three Hours



**GUG/W/22/14286**

Max. Marks : 80

- Notes :
1. All questions carry equal marks.
  2. Due credit will be given to neatness and adequate dimensions.
  3. Assume suitable data wherever necessary.

1. a) Define irrigation. What are the advantages and ill effects of irrigation. 8
- b) What is the meant by duty? What are the factors affecting duty and how duty be improved. 8

**OR**

2. a) What is meant by surface and sub – surface irrigation. What are their types? 6
- b) Define: 3
- i) Crop Ratio
  - ii) Intensity of irrigation
  - iii) Paleo irrigation.
- c) Find filed capacity of a soil if root zone depth = 2.3 m. existing water content = 7.5%, dry density of soil is  $1.5 \text{ gm/cm}^3$ , water applied to the soil is  $550 \text{ m}^3$  water loss due to evaporation 14% and area of plot = 950 sq.m. 7
3. a) What is relation between reservoir capacity and reservoir yield. 6
- b) Discuss the factors required in the investigation of reservoir planning. 5
- c) Describe various methods adopted as water logging measures. 5

**OR**

4. a) Fix FRL, LSL, HFL, & TBL of a reservoir from following data. 8
- i) Effective storage required for crops = 3200 ha.m
  - ii) Reservoir losses = 20% effective storage.
  - iii) Carry over allowance = 10% effective storage.
  - iv) Dead storage = 10% of gross storage.
  - v) Flood lift = 3.2 m.
  - vi) Free board = 3 m.

Contour (RL)(m)	81	84	105	108	111
Storage ( $\text{M} - \text{m}^3$ )	3.62	4.25	44.75	49.26	59.25

- b) What are the principal causes of water logging? Suggest the remedial measures. 8
5. a) What are the different forces acting on gravity dam. Explain in details. 8

- b) For reducing seepage of water through the body of an earthen dam, what are provisions are made. What is piping in earthen dam? **8**

**OR**

6. a) A gravity dam is 60m high. It has top width of 6m and base width of 55 m. The upstream face is vertical. Assume the weight of concrete is  $24.5 \text{ kN/m}^3$  and water is stored upto the top of dam then **10**
- Test the dam for overturning.
  - Determine compressive stress, principal stress and shear stress at the top and heel of the dam
- Neglect all other forces except hydraulic water pressure, uplift pressure and weight of dam.

- b) Briefly discuss the checks that are required to be made to investigate the stability of earthen dam. **6**

7. a) Design an irrigation canal in clay of alluvial soil with following data. **12**
- Full supply discharge = 30 cumecs
  - Co-efficient of roughness = 0.026
  - Longitudinal slope = 1 in 5500
  - Allowable CVR = 0.9 to 1.1
  - Chezy's constant = 40
- Also check critical velocity ratio. Use Kennedy's theory.

- b) Write a short note on lining of irrigation canal. **4**

**OR**

8. a) What is balancing depth of cutting. Derive an expression for the balancing depth. **8**

- b) Design an irrigation channel to carry a discharge of 50 cumec by Kennedy's theory. **8**

9. Write a short note on. **16**
- Head Regulator.
  - Cross Regulator.
  - Canal falls.
  - Canal outlets.

**OR**

10. a) Explain the component of diversion head work with neat sketch. **8**

- b) What is the purpose of silt excluder and silt ejector. **4**

- c) Compare the weir and barrages. **4**

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