

B.E. Civil Engineering (Model Curriculum) Semester-VII  
**PCC-2 - Irrigation engineering**

P. Pages : 2

Time : Three Hours



**GUG/S/25/14286**

Max. Marks : 80

- Notes :
1. All questions are compulsory.
  2. Due credit will be given to neatness and adequate dimensions.
  3. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) What is delta and duty? Derive relation between delta and duty. 8
- b) A field channel has a culturable command area of 2000 hectares. The intensity of Irrigation for gram is 30% & for wheat is 50%. Gram has crop period of 18 days & Kar depth of 12 cm, while wheat has a Kar period of 15 days & Kar depth of 15 cm. Calculate discharge of the field channel. 8

**OR**

2. a) Determine the frequency of irrigation from the following data. 8
- i) Field capacity of soil – 35%
  - ii) Permanent wilting point – 18%
  - iii) Density of soil – 1.5 g/cm<sup>3</sup>
  - iv) Depth of root zone – 70 cm
  - v) Daily consumptive use of water – 17 mm.
- b) Define irrigation and discuss in briefly the benefit and ill effects of irrigation. 8
3. a) What are the effects of water logging? What measures are adopted to reclaim the waterlogged area. 8
- b) FIX, FRL, LSL, HFL & TBL of a reservoir from the 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) Free board = 3.0 m.

Contour RL (m)	81	84	105	108	111
Storage (M-m <sup>3</sup> )	3.62	4.25	44.75	49.26	59.25

**OR**

4. a) State and explain, what types of investigation are required for reservoir planning. 8
- b) Explain with neat sketch storage level & storage zones in reservoir. 8
5. a) Write down difference between gravity and Earthen dam. 8
- b) Discuss various forces acting on Gravity Dam. 8

**OR**

6. a) Explain with neat sketch various components of earthen dam. 8
- b) Derive expression for determining least width of gravity dam based on. 8
- i) Sliding criteria. ii) Stress criteria.
7. a) Using Kennedy's theory, design a channel section for the following data : 8  
Discharge  $Q = 14$  cumecs, Kutter's  $N = 0.0225$ , Critical velocity ratio = 1, Side slope 0.5 :  
1, Bed slope  $\frac{1}{5000}$ .
- b) What is canal lining? What are its advantages? Describe different types of canal lining. 8

**OR**

8. a) Design by using Lacey's theory. 8  
Discharge = 20 cumecs, silt factor = 1.0.
- b) Write note on: 8
- 1) Schedule of area statistics.
- 2) Balancing depth.
9. a) What is Head Regular? Explain its function. 8
- b) Write in brief various types of canal fall. 8

**OR**

10. a) What is Weir? Compare Weir and Barrage. 8
- b) What is diversion headwork? Explain its component with neat sketch. 8

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