

B.E. (Civil Engineering) Model Curriculum Semester-VII
PCC2-CE702 - Irrigation Engineering

P. Pages : 2

Time : Three Hours



GUG/W/24/14286

Max. Marks : 80

- Notes :
1. All questions carry equal marks.
 4. Due credit will be given to neatness and adequate dimensions.
 5. Assume suitable data wherever necessary.
 8. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Define irrigation and discuss in briefly the benefits and ill effects of irrigation. 8

b) Base period, intensity of irrigation and duty of various crops under a canal system are given in the table below. Find the reservoir capacity if the canal losses are 20% and reservoir losses are 12%. 8

Crop	Base Period	Duty ha/cumec	Area under crop hector
Wheat	120	1800	4800
Sugarcane	360	800	5600
Cotton	200	1400	2400
Rice	120	900	3200
Vegetable	120	700	1400

OR

2. a) What is duty and delta? Derive relation between delta and duty. 8

b) 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
- iv) Depth of root zone - 70 cm
- v) Daily consumptive use of water - 17 mm

3. a) What are the effects of water logging? What measures are adopted to reclaim the waterlogged area. 8

b) Explain with neat sketch storage level and storage zones in reservoir. 8

OR

4. a) What are the various causes for the reservoir sedimentation ? How would you reduce the rate of sedimentation? 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) Flood lift = 3.2 m

vi) Free board = 3 m

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

5. a) What is the difference between gravity dam and earthen dam. 8
- b) Explain with neat sketch various components of earthen dam. 8

OR

6. a) Write down various forces acting on gravity dam with neat sketch. 8
- b) Derive expression for determining lease width of gravity dam based on: 8
- i) Sliding criteria ii) Stress criteria.

7. a) Explain the following terms: 8
- i) Ridge canal ii) Berms in canal
- iii) Balancing depth.

- b) Using Kennedy's theory, design a channel section for the following data. 8
- i) Discharge = 20 m³/s.
- ii) Critical velocity ratio = 1:1
- iii) Kutter's coefficient = 0.023
- iv) Side slope = 0.5:1
- v) Bed slope = 1/5000

OR

8. a) Design an irrigation channel for the following data using Lacey's theory 8
- Discharge = 20 cumecs.
- Silt factor = 1.0

- b) What is canal lining ? What are its advantages? Describe different types of canal lining. 8

9. a) State the functions of the following in a head work with illustrative sketches. 8
- i) Fish ladder ii) Under Sluice
- iii) Divide Wall iv) Weir

- b) What are the functions of head regulator and cross regulator ? Explain with neat sketch. 8

OR

10. a) Write in brief various types of canal fall. 8

- b) What is barrage? Write down difference between weir and barrage. 8
