B.E. Final Year Civil Engineering (Model Curriculum) Sem-VII

PCC-2 - Irrigation Engineering

P. Pages : 2 **GUG/W/23/14286**

Time : Three Hours * 8 1 8 0 * 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.
4. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Describe with the help of a diagram various forms of soil moisture what do you understand by the available moisture. **8**

b) A field channel has a culturable commanded area of 2000 hectares. The intensity of irrigation for gram is 30% & for wheat is 50% Gram has a crop period of 18 days & Kor depth of 12cm, While wheat has a Kor period of 15 days & Kor depth of 15cm. Calculate the discharge of the field channel. **8**

OR

2. a) Define the following **any four.** **8**

i) Delta ii) Duty
iii) Capacity factor iv) Root zone depth
v) Field capacity

b) Determine the field capacity of a soil for the following data. **8**

i) Depth of root zone = 1.8m
ii) Existing moisture = 8%
iii) Dry intensity of soil = $1450 kg/m^3$
iv) Quantity of water applied to soil = $650 m^3$
v) Water lost due to deep percolation & evaporation = 10%
vi) Area to be irrigated = $1000 m^3$.

3. a) State and explain what types of investigation are required for reservoir planning. **8**

b) FIX, FRL, LSL, HFL & TBL of a reservoir form 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 = 3.2m
vi) Free board = 3.0m

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

OR

4. a) What are the various causes for the reservoir sedimentation? How would you reduce the rate of sedimentation? **8**

b) What is water logging? What measures are adopted to reclaim the waterlogged area. **8**

5. a) What do you understand by Galleries and shaft and why are they provided in gravity dam. **8**

b) Discuss in brief the various forces considered in the design of gravity dam. **8**

OR

6. a) Write down difference between Gravity dam and Earthen dam. **8**

b) Explain with a neat sketch of elementary & practical profile of gravity dam. **8**

7. a) Discuss the procedure for the design of a channel by Garrett's Diagram. **8**

b) Design an irrigation channel in fine alluvium to convey a discharge of 30 Cumec with a bed slope in 1 in 5000. CVR = 0.9 & Kutter's N = 0.0225. Assume side slope of 0.5:1. **8**

OR

8. a) What is the necessity of canal lining? What are the requirement of canal lining material. **8**

b) Using Lacey's theory, design a channel section for the following data: **8**
Discharge = $40 m^3/sec$
Silt factor = 1.0
Side slope = 1V: 0.5H

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 Wier and barrage. **8**

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