

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CE) (PIT) (Sem.-4)
HYDROLOGY & WATER RESOURCES

Subject Code : BTCE-403-18

M.Code : 77646

Date of Examination : 07-07-22

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- a) Draw elementary profile of a gravity dam.
- b) Write water budget equation.
- c) In order to calculate missing rainfall data, what are the various methods that can be used?
- d) Is transpiration different from evaporation? Explain.
- e) What is peak flow?
- f) How is duty related to delta?
- g) Discuss various uses of flow duration curve.
- h) What are the various crop seasons in India? Discuss with examples
- i) What do you mean by scouring?
- j) What do you mean by gravity dam?

SECTION-B

2. What is Hydrograph? Discuss various factors affecting shape of hydrograph.
3. Determine the time required to irrigate a strip of land of 0.04 hectares in area from a tube-well with $Q=0.03$ cumes; $f=6$ cm/hr and $Y_{avg}=10$ cm

where, Q = Discharge through supply ditch

Y_{avg} = Average depth of water flowing over the strip

f = Infiltration rate of the soil.

(Assume data, if required)

4. Water shed has five non-recording rain gauge installed in its area. The amount of rainfall recorded for one of the years is given below.

Rain gauge station	Annual rainfall (cm)
I	100
II	120
III	190
IV	95
V	125

Find the required optimum number of non-recording rain gauge for this watershed. Assume an error of 10% in the estimation.

5. What are the various types of irrigation efficiency? Discuss in detail
6. Discuss various forces acting on a gravity dam in detail.

SECTION-C

7. What is canal lining? Discuss various types of canal lining and their advantages in detail.
8. Discuss in detail Kennedy's and Lacey's theory for design of canal. With drawbacks.
9. A lake had a water surface elevation of 104.200 m above datum at the beginning of certain month. In that month the lake received an average inflow of $7.0\text{m}^3/\text{s}$ from surface runoff sources. In the same period the out flow from the lake had an average value of $7.5\text{m}^3/\text{s}$. Further, in that month, the lake received a rainfall of 146 mm and the evaporation from the lake surface was estimated at 8.10 cm. Write the water budget equation for the lake and calculate the water surface elevation of the lake at the end of the month. The average lake surface area can be taken as 4000 Ha. Assume that there is no contribution to or from the ground storage.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.