

**B.TECH.**  
**(SEM VII) THEORY EXAMINATION 2023-24**  
**IRRIGATION AND WATER RESOURCE ENGINEERING**

Time: 3 Hours

Total Marks: 100

**Note:** Attempt all Sections. If require any missing data; then choose suitably.

**SECTION A**

**1. Attempt all questions in brief. 2 x 10 = 20**

- (a) Give the name of abstractions from precipitations.
- (b) Write the difference between the precipitation and rains.
- (c) Define standard project flood.
- (d) What do you understand by base flow separation?
- (e) Write the limitations of Lacey's theory
- (f) Define balancing depth.
- (g) What do you understand by deep open drains?
- (h) Define upstream approach.
- (i) What do you mean by friction blocks?
- (j) What is water well?

**SECTION B**

**2. Attempt any three of the following: 10 x3 = 30**

- (a) Write the importance of hydrology. Describe
- (b) Explain with neat sketch components of a single peaked hydrograph.
- (c) What do you understand by roughening devices? Explain Baffle walls.
- (d) With neat sketch explain sections of groynes.
- (e) How do you select selection of suitable site for a tube well?

**SECTION C**

**3. Attempt any one part of the following: 10 x1 = 10**

- (a) The rainfall rates of successive 30- minutes intervals up to 4 hours are given below . If the surface runoff is 3.6 cm . Determine  $\phi$  and W index.

Time (minutes)	0	30	60	90	120	150	180	210	240
Rainfall intensity (cm/h)	0	1.3	2.8	4.1	3.9	2.8	2.0	1.8	0.9

- (b) Give various flood discharge formulae for Indian catchments.

**4. Attempt any one part of the following:**

**10 x1 = 10**

- (a) Write assumptions of unit hydrograph theory. Also write the use of unit hydrograph theory.
- (b) A water course has a culturable commanded area of 1200 hectares. The intensity of irrigation for crop A is 49% and for crop B is 35%, both the crops being Rabi crops. Crop A has a kor period of 20 days and crop B has kor period of 15 days. Calculate the discharge of the water course if the kor depth for crop A is 10 cm and for B it is 16 cm.

**5. Attempt any one part of the following:**

**10 x1 = 10**

- (a) Design an irrigation canal to carry discharge of 14 cumecs. Assume  $D=0.025$  m and  $B/D= 5.7$
- (b) What do you understand by canal breaches? Write reasons for canal breaches.

**6. Attempt any one part of the following:**

**10 x1 = 10**

- (a) With neat sketches explain flow of ground water to drains.
- (b) Define sensitivity and setting of an outlet. Find the relation between sensitivity and Flexibility of an out let.

**7. Attempt any one part of the following:**

**10 x1 = 10**

- (a) A tube well of 30 cm diameter penetrates fully in an artesian aquifer. The strainer length is 15 m, Calculate the yield from the well water drawdown of 3 m. The aquifer consists of sand effective size of 0.2 mm having coefficient of permeability equal to 50m/day. Assume radius of drawdown equal to 150 m.
- (b) Distinguish clearly between a shallow well and a deep well. How does a deep well differ from a tube well in confined aquifer.