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B.TECH.
(SEM VII) THEORY EXAMINATION 2022-23
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 φ 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 canalbreaches? 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.