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B.TECH
(SEM VII) THEORY EXAMINATION 2017-18
WATER RESOURCES ENGINEERING

*Time: 3 Hours**Total Marks: 100***Note: 1.** Attempt all Sections. If require any missing data; then choose suitably**SECTION A**

- 1. Attempt all questions in brief. 2 x 10 = 20**
- What is hydrologic cycle? Write different components of hydrologic cycle.
 - What is transpiration? What are different factor that affect transpiration?
 - Write short note on Standard project flood (SPF).
 - What is Phreatic line? What is its use?
 - What is crop rotation?
 - Discuss the economic viability of lining of canal.
 - What are the basic principles of regulation of a canal system?
 - Write short note on well loss and well efficiency.
 - What is water logging?
 - What is Dupit's theory?

SECTION B

- 2. Attempt any three of the following: 10 x 3 = 30**
- What is S-hydrograph? How would you derive a S-hydrograph? Discuss the procedure of derivation of the unit hydrograph from a S- hydrograph.
 - Determine the optimum number of rain gauges for the a basin with the following data:
 Number of existing gauges=6
 Allowable percentage error = 8%
 The average rainfall at the existing gauges = 90, 100, 85, 65, 55 and 46 cm.
 - Design an irrigation channel to carry a discharge of 30 cumec by Kennedy's theory. Take B/D ratio as 8.0, N= 0.0225 and m = 1.0.
 - What are different types of pumps used for tube wells? What are their limitations and relative advantages and disadvantages?
 - What are the various purposes for which river training work is required? What are different types of river training works?

SECTION C

- 3. Attempt any one part of the following: 10 x 1 = 10**
- What is infiltration capacity? What are the different factors affecting infiltration rates? Describe infiltration indices which are commonly used.
 - What do you understand by the rainfall intensity? Explain the methods for the preparation of the intensity duration curves and the intensity duration curves. What are their uses?
- 4. Attempt any one part of the following: 10 x 1 = 10**
- The ordinate of a 4 hour unit hydrograph are given below. Using the principle of superposition construct an S hydrograph and calculate the discharge at equilibrium stage and the time of its occurrence from the beginning of direct runoff.

Time (hour)	0	4	8	12	16	20	24
cumec	0	4	12	6	3	1	0

- (b) What do you understand by consumptive use of water? How it different from evapotranspiration?

5. Attempt any one part of the following: 10 x 1 = 10

- (a) Describe different methods of irrigation in brief. What are the advantages and disadvantages of irrigation?

- (b) The ordinates of a 3 hour unit hydrograph are following:

Time (hr)	0	3	6	9	12	15	18	21	24	27	30
Discharge (cumec)	0.0	3.08	4.94	8.64	9.88	7.41	4.94	3.70	2.47	1.23	0.0

Develop a unit hydrograph of 6 hour unit hydrograph.

6. Attempt any one part of the following: 10 x 1 = 10

- (a) What are the basic principles of regulation of a canal system? Explain the various method of regulation of canal system.
- (b) Explain semi-module, rigid module and their types. Describe a semi-module consisting of a submerged pipe.

7. Attempt any one part of the following: 10 x 1 = 10

- (a) Derive the basic equation of unsteady flow. What are the various assumptions? What are advantages of non equilibrium equation over the steady flow equation?
- (b) Differentiate between open wells and tube well. What are the advantages of tube well over open well?