

P P SAVANI UNIVERSITY

Fifth Semester of B. Tech. Examination

December 2021

SECV3051 Hydrology and Water Resource Management

09.12.2017, Thursday

Time: 09:00 a.m. To 11:30 a.m.

Maximum Marks: 60

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION - I

- Q - 1 Enlist and explain any five drainage Characteristic [05]
- Q - 2 (a) Explain Hydrological cycle with neat sketch. [05]
- Q - 2 (b) Define evaporation and Describe factor affecting it. [05]

OR

- Q - 2 (a) The rates of rainfall for the successive 30 min period of a 4-hour storm are: 1, 3, 5.0, 3.8, 3.2, 1.0 cm/hr. The corresponding surface runoff is estimated to be 3.6 cm. Establish the ϕ -index. Also determine the W-index. [05]
- Q - 2 (b) Describe the form of precipitation in detail. [05]
- Q - 3 The followings are coordinates of 3hour unit hydrograph. Find the ordinates of 6hour unit hydrograph for the same basin, analytically. Also sketch the unit hydrograph [10]

Time in (hr)	0	3	6	9	12	15	18	21	24	27	30
Ordinates (m ³ /sec)	0	15	25	28	16	12	10	7	6	2	0

- Q - 4 Explain Reservoir Sedimentation and any one method to control it. [05]
- Or
- What is Spillway? What are the types of it and explain ogee-spillway.

SECTION - II

- Q-1 Attempt any Four [16]
- 1 Discuss Hydro power plant and its various components of with line sketch
 - 2 Enlist and explain various causes of flood.
 - 3 Define Flood Routing and explain various types of flood routing method in brief
 - 4 List out various method of Rainwater harvesting. Explain Roof Top rainwater harvesting in detail.
 - 5 List out various types of dam and their suitability in detail. Explain any one in detail.
- Q-2 Attempt any Two [14]
- 1 Discuss about Design flood and estimation of design flood. What return period would you adopt in the design of culvert on a drain if you are allowed to accept only 5% risk of flooding in the 25 years of expected life of culvert?
 - 2 Write the short note on 1)Flood Control Measures 2)Hydel Scheme
 - 3 Explain the causes of Drought and remedial measures to control the draught in brief.

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SECTION - I

Q-1 Attempt any Four

- 1 Define the term Hydrology and explain Hydrological Cycle with neat sketch [16]
- 2 Enlist and explain the factors affecting the selection of type of dam.
- 3 Describe the use of Unit Hydrograph and also Discuss the limitation of Unit hydrograph
- 4 Discuss about factors affecting the Infiltration in details
- 5 List out various types of dam and their suitability in detail. Explain any one in detail.

Q-2 Attempt any Two

- 1 The followings are coordinates of 3 hour unit hydrograph. Find the ordinates of 6 hour unit hydrograph for the same basin, analytically. Also sketch the unit hydrograph. [14]

Time in (hr)	0	3	6	9	12	15	18	21	24	27	30
Ordinates (m ³ /sec)	0	10	25	20	16	12	9	7	5	3	0

- 2 Write the short note on 1) Significance of Pumping Test 2) Ogee Spillway
- 3 Describe the terms Reservoir Capacity , Reservoir Sedimentation in detail

SECTION - II

- Q - 1 Classify and explain various kind of hydroelectric plant [05]
 - Q - 2 (a) Enlist various method of flood prevention and describe any one in detail. [05]
 - Q - 2 (b) What is flood frequency analysis? [05]
- OR
- Q - 2 What is routing? explain anyone method of reservoir routing. [10]
 - Q - 3 (a) Define Drought and write down its causes. [05]
 - Q - 3 (b) Describe types of draught [05]
 - Q - 4 Enlist and explain anyone type of rainwater harvesting method. [05]
