

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V(NEW) EXAMINATION – SUMMER 2022****Subject Code:3151311****Date:02/06/2022****Subject Name:Groundwater Hydrology and Contamination****Time:02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

Q.1 (a) Write the assumptions made in dupuit's theory. **03**

(b) Describe the hydrological water budget with the aid of example. **04**

(c) An artesian tube well has a diameter of 20 cm. the thickness of an aquifer is 30m and its permeability is 40 m/day. Find its yield under a drawdown of 5 m at the well face use radius of influence as recommended by sichardt. **07**

Q.2 (a) What do you mean by Ground water table? **03**

(b) Differentiate between Groundwater and Surface water. **04**

(c) Explain in detail ground water in hydrological cycle with neat sketch. **07**

OR

(c) What is ground water? Discuss formation of ground water with neat sketch. **07**

Q.3 (a) Explain the Darcy's law. What are its limitations? Discuss its validity. **03**

(b) Explain the pumping test to estimate the safe yield from an open well. **04**

(c) Derive the expression for steady radial groundwater flow in Unconfined aquifer **07**

OR

Q.3 (a) What do you mean by Perched aquifer? **03**

(b) Explain the recuperation test to estimate the safe yield of an open well. **04**

(c) Derive the expression for steady radial groundwater flow in Confined aquifer. **07**

Q.4 (a) Enlist the site selection criteria for artificial recharge. **03**

(b) Explain artificial recharge for "energy purpose". **04**

- (c) What is artificial recharge? Explain different artificial recharge methods of ground water. **07**

OR

- Q.4** (a) Explain induced recharge method with their flow pattern. **03**
(b) Enlist and explain ground water remediation methods. **04**
(c) Explain in detail different sources responsible for ground water pollution with causes. **07**

- Q.5** (a) What do you mean by Artesian well? **03**
(b) Difference between fully and partial penetrating wells. **04**
(c) Write down the Indian & International standards for ground water quality **07**

OR

- Q.5** (a) Write down the ground water quality criteria for drinking water. **03**
(b) Differentiate between Aquitard, Aquifuge and Aquiclude. **04**
(c) A well penetrates fully a 10 m thick water bearing stratum of medium sand having coefficient of permeability of 0.05 m/sec. the well radius is 10cm and is to be worked under a drawdown of 5 m at the well face. Calculate the discharge from the well. What will be the percentage increase in the discharge if the radius of the well is doubled? Take R= 300m in each case. **07**
