

# KERALA AGRICULTURAL UNIVERSITY

B.Tech (Agrl.Engg.) 2014 Admission  
VI<sup>th</sup> Semester Final Examination-July-2017

Cat. No: Iden.3207

Marks: 50

Title: Ground water, Wells and Pumps (2+1)

Time: 2 hours

## I Fill up the blanks/State True or False/Define

(10x1=10)

1. According to-----the velocity of flow in porous medium is proportional to the hydraulic gradient.
2. The suction limit of centrifugal pump is -----m
3. A geological formation with no interconnected pores and hence can neither absorb nor transmit water is called as-----
4. The line of joining the equal elevations of water table is called as -----
5. Sum of specific yield and specific retention is -----
6. Transmissivity (T) = -----
7. What is drawdown?
8. Propeller pumps are used for low head and high discharge operations. (T/F)
9. Hydraulic resistance is reciprocal of leakage factor (T/F)
10. The turbidity in ground water sample can be quickly estimated by a flame photometer. (T/F)

## II Write short notes/answers on any FIVE of the following

(5x2=10)

1. Explain the terms – Hydraulic conductivity and Leakage factor.
2. Differentiate aquitard and aquiclude.
3. Explain about WHP, SHP and BHP.
4. State the assumptions of Thiem's equation.
5. Write the different classifications of centrifugal pumps.
6. Differentiate Piezometer and observation well.
7. What is perched water table?

## III Write short answers on any FIVE

(5x4=20)

1. Discuss the methods of artificial recharge of ground water.
2. Discuss about pump characteristic curves.
3. Explain the operation of centrifugal pump with neat diagram.
4. Calculate the cost of pumping 4 million liters of water from a well with a centrifugal pump from the following data. Suction head= 3 metres; Delivery head= 7 meters; Friction head= 1.5 metres Output of the pump = 40,000 litres/hour; pump efficiency = 70 percent Motor efficiency = 85 percent; cost of electricity = 10 Paise per unit.
5. Explain the different types of wells based on the method of construction.
6. A centrifugal pump delivers 1,36,380 lph from a head of 7.44m. It is directly driven by an electric motor with the input hp of 6.66 and 75% motor efficiency, what is the efficiency of the pump?
7. Explain Flow net analysis.

## IV Write essay on any ONE

(1x10=10)

1. Derive the equations for flow in to the aquifer under steady state condition.
  - a. Unconfined aquifer.
  - b. Confined aquifer.
2. Explain about ground water exploration techniques.

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