



**KERALA AGRICULTURAL UNIVERSITY**  
**B.Tech.(Agrl. Engg.) 2019 Admission**  
**VI Semester Final Examination - June 2022**

**Iden. 3209**

**Ground water, Wells and Pumps (2+1)**

**Marks: 50**

**Time: 2 hours**

**(10x1=10)**

**I Fill in the blanks**

1. The volume of water, expressed as a percentage of the total volume of the saturated aquifer, that can be drained by gravity is called .....
  2. A geologic formation which can only store water but cannot transmit significant amounts is called .....
  3. .... is the recorded description of the materials encountered in sequence throughout the drilling of a well, with formations accurately noted as distances from the surface of the ground.
  4. The yield per unit of drawdown of a well is called its .....
  5. .... is the method of working a block or plunger up and down in the tube well so that the water is alternatively forced into the surrounding formation and then allowed to flow back into the well.
  6. The volume of water delivered by a .....pump is constant, regardless of the head against which it operates.
  7. The theoretical power required for pumping is called .....
  8. The theoretical maximum possible suction lift of a centrifugal pump is .....m.
  9. To drive a vertical turbine pump from a horizontal shaft of an engine, with a belt, a .....belt drive is required.
- State True or False**
10. The efficiency of a jet pump is usually higher than a centrifugal pump.

**II Write short notes on ANY FIVE of the following**

**(5x2=10)**

1. Storage coefficient
2. Perched water table
3. Well interference
4. Cavity well
5. Specific speed
6. Pump characteristic curves
7. Propeller pump

**III Answer ANY FIVE of the following**

**(5x4=20)**

1. Derive the equation for steady state flow (discharge) to wells in confined aquifer.
2. A 10 cm diameter well is pumped at a uniform rate of 10000 lpm. Observations of drawdown, taken at 1m and 100 m distances from the centre of the well, are 5 m and 0.2 m, respectively. Determine the hydraulic conductivity of the aquifer assuming the thickness of the saturated part of the aquifer to be 1m and original elevation of the water table from the impervious layer as 30 m.
3. Briefly explain the different methods of well development.
4. Briefly explain the different artificial ground water recharging techniques.
5. Give a detailed classification of different types of pumps.

6. Explain the working principle of a jet pump.
7. A pump discharges 30 lps, against a total head of 20 m. Compute the water horse power. If the pump and the motor are having efficiencies of 70% and 80% respectively, calculate the cost of electrical energy required for a month of 30 days. The pump is operated for 8 hours daily and the cost of electrical energy is Rs. 0.60 per unit.

**IV Write an essay on ANY ONE of the following (1x10=10)**

1. What are the different methods of tube well drilling? Explain in detail the down-the-hammer (DTH) method of tube well construction.
2. Explain the working principle of a centrifugal pump with a neat sketch and list the different components. Also give the classification of centrifugal pumps based on impeller types.

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