



KERALA AGRICULTURAL UNIVERSITY
B. Tech. (Agrl. Engg.) 2020 Admission
VI Semester Final Examination – July 2023

Iden.3209

Groundwater, Wells and Pumps (2+1)

Marks: 50
Time: 2 hours

- I State True or False (10x1=10)**
1. The water in the saturated zone is held at a pressure greater than the atmospheric pressure.
 2. Seismic refraction method assumes that the velocity of seismic waves decreases with depth.
 3. The analytical solutions to groundwater problems are always accurate and reliable.
 4. The grain size analysis method is based on relationships between soil properties and hydraulic conductivity.
 5. Leakage takes place through the confining layers from an adjacent aquifer in leaky confined aquifers.
 6. For practical purposes, a minimum open area of 15% is desirable in well screens.
 7. Dug wells can be constructed using portable excavating equipment such as clamshell and orange-peel buckets.
 8. Percussion drilling is highly effective in unconsolidated sand and gravel formations, especially quicksand.
 9. It is assumed that the liquid enters the impeller tangentially for best efficiency.
 10. Axial flow pumps usually have fixed guide vanes to straighten the flow and convert the spin component of velocity into extra pressure.
- II Write short notes on ANY FIVE of the following (5x2=10)**
1. What are some important hydraulic and hydrogeologic parameters used to characterize an aquifer system?
 2. Explain the cavity well.
 3. What are slug tests and how are they used to determine aquifer parameters
 4. Define natural gravel pack
 5. What are the types of well screens commonly used in groundwater wells?
 6. Explain the working principle of hydraulic ram
 7. A centrifugal pump requires 5 kW power when it runs at 1450 rpm and delivers water against a head of 10 m. If the pump is operated at 1750 rpm, calculate the head developed and the power required by the pump.
- III Answer ANY FIVE of the following (5x4=20)**
1. What are the benefits and applications of remote sensing technology in groundwater studies?
 2. Explain the different types of aquifers with neat sketch.
 3. Discuss the steady radial flow in confined aquifers
 4. What are the advantages and disadvantages of using the rotary drilling method for constructing wells?
 5. What is the process involved in constructing jetted wells, and how does it differ from other drilling methods?
 6. What are the six basic mechanical principles involved in lifting water when free gravity flow is not available for draining surface or subsurface water?
 7. Explain types of Centrifugal Pumps Based on Working Head

IV

Write an essay on ANY ONE of the following

(1x10=10)

1. Write note on the classification of pump
2. What are pump characteristic curves? How are they classified, and what are the main characteristic curves and operating characteristic curves?
