



KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Agri. Engg.) 2022 & Previous Admissions
VI Semester Final Examination - June 2025

Iden.3209

Groundwater, Wells and Pumps (2+1)

Marks: 50
Time: 2 hours

I Fill in the blanks

(10x1=10)

1. is often used as an index to operating characteristics of pumps.
2. is the vertical distance from the free suction water level to the centre line of the pump.
3. is the theoretical horse power required for pumping.
4. is the difference between the static water level and pumping water level at that instant.
5. Formation that contains water but does not transmits is called as
6. The clean sand saturated with fresh water shows relatively resistivity.

Define the following

7. Well logging
8. Water hammer

State True or False

9. The capacity of the pump varies directly as the speed of the pump.
10. Specific yield is the property of an unconfined aquifer.

II Write short notes on ANY FIVE of the following

(5x2=10)

1. What do you mean by aquifer? Discuss the type of aquifer in brief.
2. What do you mean by piezometric level and piezometric surface?
3. What are the desirable features for properly designed well screen? What are the common types of well screens used in India?
4. Discuss the core drilling in detail
5. What are the different indigenous water lifting devices? Discuss Archimedean Screw in detail.
6. Differentiate between propeller and mixed flow pump.
7. A centrifugal pump at its best point of efficiency discharges 30 l/s against a total head of 40 m when the speed is 1500 rpm. Compute the specific speed of the pump.

III Answer ANY FIVE of the following

(5x4=20)

1. Draw a schematic diagram illustrating artesian & water table aquifers, water table well, flowing artesian well, sub artesian well and potential recharge area for the artesian aquifer.
2. Enlist the component of tubewell design. Explain the design of gravel pack.
3. What is difference between positive and variable displacement pump? What are different types of variable displacement pumps? Write the working principle of centrifugal pump.
4. What do you mean by hydrogeology? What are different groundwater exploration techniques? Discuss Gamma ray logging.
5. A deep well single acting piston pump has a cylinder diameter of 12 cm and stroke length of 25 cm. The pump makes 75 double strokes per minute. Calculate the discharge of the pump in litres per hour. If the total head is 32 m and pump efficiency is 65%, determine the horse power required to drive the pump.
6. A 10 cm diameter well penetrates 8 m thick water bearing strata underlain and overlain by impermeable beds. The well was operated with a constant discharge of 100 lpm for 12 hrs. The steady state drawdowns were found to be 3 and 0.05 m at distance 10 m and 50 m respectively from the centre of the well. Using Dupuit-Thiem equation calculate the transmissibility and hydraulic conductivity of the aquifer.
7. Discuss the cable tool percussion drilling and adaptability & advantages of cable tool drilling method.

IV

Write an essay on ANY ONE of the following

(1x10=10)

1. What are the troubles in centrifugal pump? And what are the causes of occurrence of those troubles?
2. Write the assumptions and derive equation for steady state flow to well in a unconfined aquifer with neat labelled diagram.
