

H-4/36/22

Roll No.

IV Semester Examination, 2022**M.Sc.****GEOLOGY**

Paper IV

(Advance Hydrogeology)

Time : 3 Hours]

[Max. Marks : 80

Note : All questions are compulsory. Question Paper comprises of 3 sections. Section **A** is objective type/multiple choice questions with no internal choice. Section **B** is short answer type with internal choice. Section **C** is long answer type with internal choice.

SECTION A**1×10=10****(Objective Type Questions)**

Choose the correct answer :

1. Perched aquifers occurs :

- (a) Below water table
- (b) In zone of aeration
- (c) In zone of saturation
- (d) In zone of disconnected openings

P.T.O.

2. The interface is defined as :

- (a) Boundary between charge and discharge zone
- (b) Boundary between salt and fresh water
- (c) Boundary between zone of aeration and zone of saturation
- (d) None of the above

3. In pumping test, the distance between the pumped well and observation well should not be :

- (a) Less than twice the thickness of aquifer
- (b) Less than half the thickness of aquifer
- (c) More than the thickness of aquifer
- (d) Less than the thickness of aquifer

4. Cooper Jacob method for pumping test with single well utilizes following relationship.

- (a) Time-draw down (b) Distance draw down
- (c) Both (a) and (b) (d) None of these

5. Caliper log is a record of :

- (a) Well depth (b) Well diameter
- (c) Ground water level (d) Zone of saturation

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6. Electrical sounding survey gives information about :
- (a) Lateral variation
 - (b) Both lateral and vertical variation
 - (c) Vertical variation
 - (d) None of the above
7. The desirable limit of pH for drinking water (as per IS : 10500) is :
- (a) 5.2–7.5
 - (b) 6.5–8.5
 - (c) 7.5–8.5
 - (d) None of these
8. SAR stands for :
- (a) Sodium absorption ratio
 - (b) Silica absorption ratio
 - (c) Soil alkalinity ratio
 - (d) Soil and recharge
9. Well interference is caused due to :
- (a) Short distance between the wells
 - (b) Shallow depth of two wells
 - (c) Great diameter of two wells
 - (d) None of the above

10. Excessive discharge in relation to recharge may cause :
- (a) Permanent damage to the aquifer
 - (b) Over draft
 - (c) Subsidence
 - (d) All of the above

SECTION B**4×5=20****(Short Answer Type Questions)**

Note : Attempt one question from each unit. Answer 250 word in each question.

Unit-I

1. Distinguish between confined and leaky aquifer.

Or

What is Ghyben-herzberg relation and when this relation is valid ?

Unit-II

2. Describe the darcy's law and its validity.

Or

Define the laminar and turbulent flow in ground water.

Unit-III

3. What do you understand by Geophysical well logging ? Discuss the resistivity log.

Or

Discuss the remote sensing techniques in ground water exploration.

Unit-IV

4. What are the salinity Hazard and Na Hazard ?

Or

Explain the piper's trilinear diagram for representing of Geochemical data of ground water analysis.

Unit-V

5. Discuss the watershed management.

Or

Write a note on impact assessment of artificial recharge.

SECTION C**10×5=50****(Long Answer Type Questions)**

Note : Answer the following questions in 500 words.

Attempt one question from each unit.

Unit-I

1. Discuss the occurrence of ground water in unconsolidated formation.

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P.T.O.

Or

What is the saline water intrusion and what are the situation to be considered for intrusion of saline water ? Discuss the prevention and control of saline water intrusion.

Unit-II

2. Describe the different methods of pumping test for unconfined aquifer, non steady state condition.

Or

Explain :

- (i) Flow net analysis
- (ii) Bounded aquifer

Unit-III

3. What is the basic concept of surface geophysical methods of G.W. Exploration ? Discuss the electrical resistivity method of exploration.

Or

What are the objectives of ground water modelling ? Classify the different type of models based on the principles involved in their designing and discuss the sand model in detail.

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Unit-IV

4. Discuss the ground water pollution the following head :

- (i) Pollution factors
- (ii) Sources and nature of pollution
- (iii) Pollution mechanism
- (iv) Detection and prevention

Or

Discuss the various quality criteria of ground water for agriculture and industrial use.

Unit-V

5. Discuss the various methods of artificial recharge.

Or

What are the different components of ground-water balance study ? Discuss the estimation of ground water recharge and discharge component.

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