

UNIVERSITY OF PETROLEUM  
AND ENERGY STUDIES



End Semester Examination – December, 2017

Program/course: B.Tech GSE  
Subject: Ground Water Exploration  
Code : GSEG 301  
No. of page/s: 4

Semester – III  
Max. Marks : 100  
Duration : 3 Hrs

Section-A

Answer all questions

1. List out the various component of hydrological cycle [5X4=20]  
[5]
2. Draw a sketch diagram of dipole-dipole arrangement for resistivity survey [5]
3. Write the correct answer for multiple choice questions [1x5=5]
- A. Formation material having highest specific yield is
- a) sandstone
  - b) gravel
  - c) clay
  - d) limestone
- B. Porosity can be expressed as
- a) Specific retention – Specific yield
  - b) Specific retention X Specific yield
  - c) Specific retention + Specific yield
  - d) Specific retention / Specific yield
- C. A geological formation which can only store water but cannot transmit is:
- a) aquifer
  - b) aquitard
  - c) aquiclude
  - d) aquifuge
- D. What is the process by which water enters the small pore spaces between particles in soil or rocks?
- a) transpiration
  - b) infiltration
  - c) precipitation

- d) sublimation
- E. The ability of an Earth material to transmit water is a measure of its:
- a) porosity
  - b) aquifer characteristics
  - c) chemical cement
  - d) permeability
4. Write the correct answer for multiple choice questions [1x5=5]
- A. The lowering effect on the water table about the base of the well stem is called a(n):
- a) Aquiclude
  - b) artesian surface
  - c) cone of depression
  - d) speleothem
- B. A local water table positioned above the regional water table is said to be:
- a) stranded,
  - b) perched,
  - c) displaced,
  - d) depressed
- C. Groundwater represents how much of the world's hydrosphere supply?
- a) about 1%,
  - b) about 5%
  - c) about 20%
  - d) about 50%
- D. Sounding survey is generally conducted with
- a) Schlumberger array
  - b) Wenner array
  - c) Dipole-dipole array
  - d) Pole-pole array
- E. Piezometric surface is related to
- a) Imaginary water surface of unconfined aquifer
  - b) Imaginary water surface of confined aquifer
  - c) Actual Water table of unconfined aquifer
  - d) Actual water surface of confined aquifer



**Section – B**

**Answer all questions**

**[6X10=60]**

5. Explain the various aquifer properties being studied for confined and unconfined aquifer [10]
6. Evaluate the geological method of groundwater prospecting in consolidated and unconsolidated formations in India [10]
7. Explain the Schlumberger method of resistivity survey with representative example of delineating aquifer depth and thickness [10]
8. Give a brief overview of numerical modelling for quantitative groundwater analysis being used in worldwide. [10]
9. Evaluate the relevance of various recharge structure in groundwater infiltration under different geological terrain of India [10]
10. How VLF method is said to be more effective than electrical survey method in hard rock terrain for groundwater exploration? [10]

OR

Demonstrate the role of seismic refraction method in delineating the depth and thickness of aquifer [10]

**Section – C**

**Answer all questions**

**[1X20=20]**

11. A) Evaluate the environmental impacts of over exploitation of groundwater in coastal part of India [10]
- B) What are the different laws and regulation being enacted by state and central government of India to protect the groundwater resource? [10]

Discuss in detail on groundwater quality in various parts of India. How groundwater quality parameters can adversely affects the health of human being? [12+8]