

# AR18

**CODE: 18ECE443**

**SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**IV B. Tech II Semester Supplementary Examinations, July, 2025**

**GLOBAL POSITIONING SYSTEM  
(ELECTRONICS AND COMMUNICATION ENGINEERING)**

**Time: 3 Hours**

**Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

## **UNIT-I**

1. a) Explain in brief about evolution of GPS 6M  
b) Explain the process of identifying the receiver position in 2D and 3D? 6M  
(OR)
2. With neat diagram explain the working principle of GPS 12M

## **UNIT-II**

3. a) Give the various segments involved in GPS with brief explanation 6M  
b) Explain in brief about position determination using PRN codes 6M  
(OR)
4. a) Summarize the characteristics of C/A code 6M  
b) Draw the signal structure of GPS and explain in brief 6M

## **UNIT-III**

5. Explain different types of coordinate systems 12M  
(OR)
6. a) Explain the need of WGS 84 system in GPS position computation 6M  
b) Give the details of conversion between Cartesian and geodetic coordinate frame 6M

## **UNIT-IV**

7. a) Explain the RINEX format of observation and navigation data files 6M  
b) Give the orbital parameters in GPS 6M  
(OR)
8. Describe the steps involved in receiver position estimation using Least Squares Approximation method 12M

## **UNIT-V**

9. Explain in detail about different error sources in GPS 12M  
(OR)
10. a) Give the details of ionospheric error? 6M  
b) Explain the need of dual frequency GPS receiver 6M

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

### UNIT-I

1. a) Derive 3-D differential equation governing ground water flow and also mention the assumptions made while deriving it. 7M
- b) Discuss about vertical distribution of ground water with a neat sketch. 7M
- (OR)
2. a) Explain ground water hydrologic cycle. 7M
- b) Why ground water flow contours are prepared and mention their applications. 7M

### UNIT-II

3. a) Derive the expression for discharge for steady radial flow into a well fully penetrated in a confined aquifer. 7M
- b) What is recuperation and derive the expression for discharge from open well by recuperation test? 7M
- (OR)
4. a) Explain Dupit's and Theism's equations and also mention the assumptions made for the ground water analysis. 7M
- b) Derive the non-equilibrium equation for ground water flow for unsteady case. 7M

### UNIT-III

5. a) What is aerial photogrammetry and discuss its applications in sub-surface investigation for ground water? 7M
- b) Discuss in detail about Geophysical logging method of ground water exploration. 7M
- (OR)
6. a) Explain a case study on groundwater investigation by subsurface methods. 7M
- b) Discuss in detail about Electrical resistivity method of ground water exploration. 7M

### UNIT-IV

7. a) Explain the concept of Artificial Recharge of ground water and also mention various methods of Artificial Recharge. 7M
- b) What is Remote sensing and GIS and explain applications of these methods in Artificial Recharge of Ground water? 7M
- (OR)
8. a) Explain various methods of Artificial Recharge of ground water with neat sketches. 7M
- b) Discuss any two case studies of Artificial Recharge of ground water by RS & GIS. 7M

**UNIT-V**

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|-------------|----|--|----|
| 9.          | a) | Explain various factors affecting saline water intrusion into aquifers.          | 7M |
|             | b) | Discuss about ground water basin management with case studies.                   | 7M |
| <b>(OR)</b> |    |  |    |
| 10.         | a) | Derive Ghyben-Herzberg relation between fresh and saline water with neat sketch. | 7M |
|             | b) | Explain the methods to control the seawater intrusion.                           | 7M |