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Question Paper Code :

**ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES  
(AUTONOMOUS)**

M.E/M.Tech I-Semester Regular Examinations, November 2015

**GPS & Applications**

**(Communication Systems)**

**Date:**

**Time: 3 hours**

**Max Marks: 60**

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**Answer ONE Question from each Unit**

**All Questions Carry Equal Marks**

**All parts of the question must be answered in one place only**

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**UNIT-I**

1.
  - a. Explain the basic principle of GPS. (4M)
  - b. Explain GPS Architecture with the help of various segments and neat diagrams. (8M)

**(or)**
2.
  - a. Explain why augmentation is necessary for GPS and mention any three names of augmentation systems being implemented around the world. (6M)
  - b. Explain the principle of operation of GAGAN with the help of neat block diagram(6M)

**UNIT-II**

3.
  - a. Explain with a neat block diagram the signal structure of  $L_1$  &  $L_2$  frequencies with the corresponding C/A, P- code and Navigation message. (6M)
  - b. Explain about the Galileo systems (6M)

**(or)**
4.
  - a. Explain the terms selective availability & anti-spoofing. (4M)
  - b. Describe the function of a GPS receiver with block diagram (8M)

**UNIT-III**

5.
  - a. Write a short notes on Geoid and Ellipsoid. (4M)
  - b Explain the salient features of ECEF and ECI Coordinate system with neat diagram (8M)

**(or)**
6.
  - a. What is meant by a datum? Mention the salient features of WGS-84? (6M)
  - b) Given semi-major axis ( $a$ )= 6378137m, square if eccentricity ( $e^2$ )= 0.00669437998. If the geographic coordinates of a point on the earth are longitude = 78.50, latitude = 17.5. And height is 500m, determine the corresponding ECEF(X,Y,Z) Coordinates. (6M)

**UNIT-IV**

7. a. Explain about the orbital parameters (6M)  
b. Describe the RINEX data format (6M)
- (or)**
8. a. Explain the code & carrier phase measurements (6M)  
b. Derive the user position estimation using satellite position. (6M)

**UNIT-V**

9. a. Discuss about various propagation errors that limit the GPS range measurements. (6M)  
b. Define TEC. With relevant equations, explain how TEC and ionospheric delay can be estimated using dual frequency measurements. (6M)
- (or)**
10. a. Explain Hardware and software improvements in GPS (4M)  
b. Explain the principle of operation of DGPS with the help of a neat diagram. (8M)