Register Number:

………………**M.E. DEGREE EXAMINATIONS: NOV/DEC 2010**Third Semester

COMMUNICATION SYSTEMS

COM515: Global Positioning Systems

Time: Three Hours   **Maximum Marks:**

100Answer ALL Questions:-PART A (10 x 2 = 20 Marks)

1.   Define pseudo range.

2.   State the salient features of Block III satellites.

3.   Which coordinate system is used for GPS referencing? Why?

4.   List different time systems in use.

5.   What the L1 and L2 frequency values?

6.   What is selective availability?

7.   What are the difficulties in arriving at a standard tropospheric model?

8.   How error sources are classified?

9.   What is the application of air borne GPS?

10. What are the factors that affect the speed and reliability of positioning?

PART B (5 x 16 = 80 Marks)

11. a) (i) Describe the general configuration of satellites required to provide continuous global

      positioning.   (8)

   (ii) Compare the deployment of C/A code and P-code for civilian and military
        applications.   (8)

(OR)

   b) (i) Detail the use of C/A code, P-code and Y-code with respect to reception.   (8)

   (ii) Describe the classification of satellites in GPS.   (8)

12. a) (i) List the Keplerian orbital parameters. Identify each of the parameters on an appropriate coordinate system. (8)

  (ii) Describe with an example, a global network used for orbital determination. (8)

(OR)

  b) (i) State and explain the different data that are available to determine the position and velocity of satellites. What are the uncertainties of the various ephemerides? (8)

  (ii) What are the sources of disturbing accelerations? Explain in detail. (8)

13. a) (i) What are the components of a satellite signal? Explain. (8)

  (ii) Describe squaring and cross correlation techniques used for recovery of L2 signal. Use necessary assumptions. (8)

(OR)

  b) (i) State the carrier modulated equations for L1 and L2. Identify each of the components used. (8)

  (ii) Describe the principle of signal processing at GPS receiver. (8)

14. a) (i) Describe the general linear phase combinations. Also, illustrate how the same is done with respect to integers. (8)

  (ii) Derive expressions for Rayleigh and modified Rayleigh equations that relate the effects of phase and group velocities. (8)

(OR)

  b (i) Describe the Hopfield model for tropospheric scattering. (8)

  (ii) Illustrate how ambiguities are resolved with wide lane techniques. Use appropriate parameters. (8)

15. a) (i) Describe the global and local use of GPS in surveying. (8)

  (ii) Discuss interoperability of GPS. (8)

(OR)

b) (i) Compare GPS with GLONASS with respect to space segment and signal structure. (8)

(ii) Describe ground based and satellite based augmentation of GPS.   (8)

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