Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **17EC3016** | **Duration :** | **3hrs** |
| **Sub. Name :** | **GLOBAL POSITIONING SYSTEM** | **Max. marks:** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Derive the expression for user position calculation using two transmitters with known two-dimensional positions. | CO1 | 14 |
| b. | Give the specifications of the two spread spectrum carrier signals used in L1 and L2 bands. | CO1 | 3 |
| c. | Compose the needs of Global Navigation Satellite Systems (GNSS) and Regional Navigation Satellite Systems (RNSS). | CO1 | 3 |
| (OR) | | | | |
| 2. | a. | With neat block diagram describe the user segment of the GPS satellite system and conclude its design parameters. | CO1 | 14 |
| b. | Describe the phases in the space segment development of the GPS satellite system. | CO1 | 3 |
| c. | Figure out the issues that affect the accuracy of PVT calculations. | CO1 | 3 |
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| 3. | a. | Describe the complexity of the GPS signal components and describe the purposes and properties of them. Also give the classification of Navigation information | CO2 | 10 |
| b. | Calculate the minimum received signal power if receiver antenna gain is 3 dB, EIRP is 26.8 dbW and free space loss factor is -182.4dB (Include atmospheric loss (-2dB)). | CO3 | 5 |
| c. | Discuss about the specifications and requirements of GPS antennas. | CO3 | 5 |
| (OR) | | | | |
| 4. | a. | With neat block diagram describe the generic GPS receiver architecture. | CO3 | 10 |
| b. | With neat block diagram, represent the functions of frequency and phase tracking systems. | CO2 | 5 |
| c. | The extraction of information for navigational solution can be classified into three categories. But recognize the generic procedure of these three categories for extracting information from the signal components. | CO2 | 5 |
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| 5. | a. | Discuss about the techniques used to find the SA model to measure the SA error.And give the procedure to determine the best model from the set of time domain models. | CO4 | 16 |
| b. | Recommend the number of channels for your receiver design. Receiver choices are: (i) The modern GPS receivers and (ii) The low-cost GPS receivers. | CO4 | 4 |
| (OR) | | | | |
| 6. | a. | Multipath problem is very important issue of GPS-Justify. Tell, how multipath causes ranging errors? And discuss any three spatial processing techniques of multipath mitigation. | CO4 | 16 |
| b. | Analyze and compare the ionospheric propagation error and tropospheric propagation error. | CO4 | 4 |
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| 7. | a. | Discuss in detail about pseudo satellite and its compatibility when the differential GPS fails to overcome inherent limitations that are critical to successful operation in specific applications. | CO5 | 14 |
| b. | Differentiate between LA-DGPS and WA-DGPS. | CO5 | 6 |
| (OR) | | | | |
| 8. | a. | Describe about the Wide Area Augmentation System (WAAS). | CO5 | 14 |
| b. | Sketch GPS/Automobile integration architecture and classify it with respect to coupling nature. | CO5 | 6 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Criticize real time aspects of GPS in intelligent transportation system. | CO6 | 10 |
| b. | Sketch out the real time applications of GPS in air navigation. | CO6 | 10 |