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Eighth Semester B.E. Degree Examination, July/August 2022 Satellite Navigation System

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the working of solar array? Also write the comparison of different semiconductor materials used for space craft missions. (10 Marks)
- b. Define Orbit and its elements for designing space mission. (10 Marks)

OR

- 2 a. Comment on power subsystem along with the requirement for LEO and GEO. (10 Marks)
- b. Write the environmental effects on design materials used in space craft missions. (10 Marks)

Module-2

- 3 a. Write general classification of positioning testing. (10 Marks)
- b. Define the following: (i) Earth centered inertial frame. (ii) Wander frame. (10 Marks)

OR

- 4 a. Write the coordinate transform between LLF and ECEF. (10 Marks)
- b. Define Quaternion? Also derive the relationship between transform matrix and Quaternion matrix. (10 Marks)

Module-3

- 5 a. Explain the working of accelerometers and its applications. (10 Marks)
- b. Explain how inertial navigation works in three dimensions along with block diagram. (10 Marks)

OR

- 6 a. Write different types of systematic errors occurs in inertial sensors. (10 Marks)
- b. Explain Schuler effect and its error model along the East channel. (10 Marks)

Module-4

- 7 a. Explain the working of reaction wheel with its limitations. (10 Marks)
- b. How does solar sail works? Write the characteristics of current solar sail. (10 Marks)

OR

- 8 a. Explain the working of electric propulsion. (10 Marks)
- b. Explain the working of Ion propulsion. (10 Marks)

Module-5

- 9 a. Explain the working of packet telemetry along with block diagram. (15 Marks)
- b. Comment on onboard data handling functions. (05 Marks)

OR

- 10 a. Write the proximity links used for space missions. (05 Marks)
- b. Comment on down link frequency and modulation. (10 Marks)
- c. Comment on telecommand user interference. (05 Marks)