



CBCS SCHEME

15EE753

Seventh Semester B.E. Degree Examination, June/July 2019 Space Craft Power Technologies

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Compare terrestrial power systems to space based systems on the basics of
i) Scale ii) Sources ii) Transmission iv) Costs v) Energy management vi) Operations. (06 Marks)
b. List the functions of electrical power system in spacecraft. (04 Marks)
c. Define the orbits that are common to near earth space operations. (06 Marks)

OR

- 2 a. Explain the selection process of electrical power system for a satellite. (08 Marks)
b. Define all the orbital elements that influence the satellite motion. (08 Marks)

Module-2

- 3 a. Draw the schematic diagram of a space satellite power system and explain. (06 Marks)
b. Discuss radiation damage of single junction cell. (06 Marks)
c. Why thin film solar cells are preferred for space applications. (04 Marks)

OR

- 4 a. Discuss solar cells used in space craft applications. (08 Marks)
b. Discuss the performance of thin film solar cells. (08 Marks)

Module-3

- 5 a. Explain the procedure for solar array sizing. (08 Marks)
b. Discuss primary and secondary batteries used in space craft. (08 Marks)

OR

- 6 a. Discuss all the performance metrics of a battery used in space craft power systems. (10 Marks)
b. List the array environmental interaction which influence the reliability of space craft. (06 Marks)

Module-4

- 7 a. List the advantages, disadvantages and potential hazards of Zinc-Manganese dioxide – Alkaline cell. (08 Marks)
b. Describe Alkaline fuel cells. How they are different from acid fuel cell? (08 Marks)

OR

- 8 a. Describe rechargeable cells. (08 Marks)
b. List the advantages, disadvantages and potential hazards of regenerative fuel cells. Also give the chemical reactions. (08 Marks)

Module-5

- 9 a. Give a schematic diagram of power management and distribution and explain. (08 Marks)
b. Explain Fault management and Telemetry in space craft. (08 Marks)

OR

- 10 a. Discuss forward converter used in space craft power systems. (08 Marks)
b. Explain different functions of power management and distribution (PMAD). (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.