

CBCS SCHEME

17AE564

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Fifth Semester B.E. Degree Examination, Aug./Sept. 2020

Basics of Rockets and Missiles

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Assume missing data if any suitably.

Module-1

- 1 a. Define a Rocket and Guided Missile. Mention the similarities and differences between them. (10 Marks)
b. Explain the performance parameters of a Rocket engine. (10 Marks)

OR

- 2 a. Define Staging. Explain the types of staging used in Launch Vehicles. Justify its significance. (10 Marks)
b. Describe different types of Launch Vehicles. (10 Marks)

Module-2

- 3 a. List out the characteristics of solid propellants. (10 Marks)
b. Explain different types of grain configurations used in solid propellant rocket motors. (10 Marks)

OR

- 4 a. Explain Gas pressurized feed system of Liquid propellant rocket engine with a neat sketch. (10 Marks)
b. List and explain different types of liquid propellants. (10 Marks)

Module-3

- 5 a. Explain the different types of Aerodynamic forces acting on a missile/rocket. (10 Marks)
b. Classify Missiles based on different modes and explain them in brief. (10 Marks)

OR

- 6 a. Define Rocket Dispersion. Explain different sources of Rocket dispersion and methods of its estimation. (10 Marks)
b. Briefly explain the airframe components of a Rocket with a neat sketch. (10 Marks)

Module-4

- 7 a. Derive the ideal Tsiolkovsky's Rocket equation. (10 Marks)
b. Explain the following with suitable equations : (10 Marks)
i) Constant Pitch Trajectory ii) Orbital Insertion.

OR

- 8 a. Explain different methods of TVC with a neat sketch. (10 Marks)
b. Explain stage separation and its various techniques to achieve it. (10 Marks)

Module-5

- 9 a. List out various types of tests performed on the Rockets and explain them in brief. (10 Marks)
b. Describe the measurable physical quantities of a rocket during its test. (10 Marks)

OR

- 10 a. Mention the Post Accident procedures to be followed in Rocket Testing. (10 Marks)
b. Describe the Criteria for selection of materials of Rockets and Missiles. (10 Marks)

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.