Hall Ticket No | | | | | | | | | | | Question Paper Code: AAEB40

INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

B.Tech V Semester End Examinations (Regular), February – 2021

Regulation: IARE–R18

ROCKET AND MISSILES

Time: 3 Hours **(AE)** **Max Marks: 70**

Answer any Four Questions from Part A
Answer any Five Questions from Part B

PART – A

1. Explain the various rocket performance parameters and write its mathematical expressions. **[5M]**
2. Write short notes on Igniter design and its hardware components. **[5M]**
3. Discuss the various applications, advantages and disadvantages of Liquid rocket engine **[5M]**
4. Summarize the functions and purpose of guidance systems incorpo- rated in rockets and missiles. **[5M]**
5. Write short notes on material selection for reentry nose cones. **[5M]**
6. Illustrate and classify various types of rocket motors. **[5M]**
7. List the various applications of Pyrotechnic igniters. **[5M]**
8. Explain the various methods of cooling of Combustion Chamber and Nozzles of a liquis rocket engine. **[5M]**

PART – B

9. Determine ideal rocket equation and express in terms of specific impulse and mass ratio. **[10M]**
10. Describe how Xenon can be used for propulsion of rockets. Has it been used so far? **[10M]**
11. Discuss the various modes of failure of solid propellant motors. **[10M]**
12. Define propellant grain configuration and explain various configuration with thrust-time curve. **[10M]**
13. Discuss the various methods of thrust vector control of liquid rockets with sketches. **[10M]**
14. Explain high frequency and low frequency combustion instabilities in liquid propellant rocket engines. **[10M]**
15. What is meant by parallel staging? Explain its advantages over other staging techniques. **[10M]**
16. Elucidate briefly how boat tail configuration reduces aerodynamic drag of a missile. **[10M]**
17. Explain the selection of materials for different parts of a nozzle of a solid or liquid rocket. **[10M]**
18. Describe in detail different types of materials, their associated physical, chemical and mechanical properties involved in fabrication of liquid engine storage tanks. **[10M]**