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BAS-024

00372

B.Tech. IN AEROSPACE ENGINEERING (BTAE)

Term-End Examination

December, 2017

BAS-024 : INTRODUCTION TO ROCKETS AND MISSILES

Time : 3 hours *Maximum Marks : 70*

Note : *(i) Answer **any seven** questions.*

*(ii) **All** questions carry **equal** marks.*

*(iii) Use of scientific **calculator** is **permitted**.*

1. (a) Explain the different types of control surfaces in missiles. **4+3+3=10**

   (b) How does a missile differ from a rocket ? Explain.

   (c) What are the characteristics of bodies of revolutions ?

2. Explain in detail the purpose and utility of rockets. **10**

3. What do you mean by thermal protection system ? Which types of thermal protection system are used in rockets and missiles ? Describe a thermal protection system based on heat dissipation. **10**

4. (a) Classify missiles according to the purpose and explain any one in detail. **2x5=10**

   (b) Explain Boost Sustained Trajectory.

5. What are igniters ? What are their functions and uses ? **10**

6. Find the diameter of a solid sustainer to give a mass flow rate of 8 kg/sec. for a propellant of density 1800 kg/m^3, burning at 12 mm/sec. **10**

7. Explain various materials used for missiles giving their characteristics with respect to their functions. **10**

8. (a) Derive equation of range for short range ballistic missile considering flat earth rectilinear co-ordinate system. **5+5=10**

   (b) What is launch boundary in air launch of missile ? Explain launch aircraft trajectory and missile trajectory.

9. Write short notes on **any two** of the following : **2x5=10**

   (a) Agni missile

   (b) Static stability

   (c) Double base propellant