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BAS-024

B.Tech. AEROSPACE ENGINEERING (BTAE)

Term-End Examination

00651

June, 2019

BAS-024 : INTRODUCTION TO ROCKETS AND MISSILES

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. All questions carry equal marks. Use of scientific calculator is permitted.*

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

2. Explain the purpose and utility of rockets. Also discuss different sub-systems of rockets. *10*

3. Derive expression for exit plane velocity for flow through a rocket nozzle. *10*

4. Classify missiles on the basis of launch modes. Describe briefly each classification. *10*

5. Find the diameter of a solid sustainer to give a mass flow rate of 5 kg/sec for a propellant of density 1760 kg/m^3, burning at 10 mm/sec. *10*

6. (a) Define payload ratio of a single-stage rocket, payload ratio of a stage of a multistage rocket and total payload ratio of the multistage rocket.

(b) Discuss the stage separation dynamics. *5+5*

7. (a) Write down the characteristics of solid propellants.

(b) Discuss the importance of the various ingredients of a solid propellant. *5+5*

8. What is geysering ? Explain the sequence of events for geysering cycle. *10*

9. What is thermal protection ? Which types of thermal protection systems are used in rockets and missiles ? Explain. *10*

10. Explain regressive, neutral and progressive burning rate in brief. *10*