

**R09**

**Code No: 58095**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B. Tech IV Year II Semester Examinations, May - 2017**

**LAUNCH VEHICLE AND MISSILE TECHNOLOGY**

**(Aeronautical Engineering)**

**Time: 3 Hours**

**Max. Marks: 75**

**Answer any Five Questions  
All Questions Carry Equal Marks**

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- 1.a) Discuss about the control and guidance requirements of missile and its performance.
- b) Explain parallel staging technique. [8+7]
2. Write a short note on following parameters:  
a) Nozzles    b) ignitors    c) propellant grain. [15]
3. Describe various types of liquid propellants and their properties. List out the additives, binders and inhibitors used. [15]
4. Estimate the lift and drag forces on a missile and what do you mean by rocket dispersion? How the dispersion can be restricted? [15]
5. Explain about earth launch trajectories with gravity turn, constant pitch and orbital injection. [15]
6. Explain briefly about thrust termination and thrust magnitude control with various techniques. [15]
7. Write about the salient features of ground tests and flight tests of the rockets and missiles? How the trajectory is monitored? [15]
8. Why a re-entry body develops high temperatures on its skin during re-entry? What types of materials are used in thermal protection system to avoid it? [15]

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