

Code No: RR322106

**RR**

**Set No. 2**

**III B.Tech II Semester Examinations, APRIL 2011  
ROCKETS AND MISSILES  
Aeronautical Engineering**

**Time: 3 hours**

**Max Marks: 80**

**Answer any FIVE Questions  
All Questions carry equal marks**

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1. (a) Explain the different types of control surfaces in missiles.  
(b) How does a missile differ from a rocket.  
(c) What are the characteristics of bodies of revolution. [6+5+5]
2. Explain the working of turbine feed system for liquid propellant rocket motor. Describe the various components used in this system. [16]
3. Find expression for the burn out velocity of an N stage rocket. [16]
4. (a) Explain why the thickness of the missile wings is kept minimum and describe the effect of wing thickness on the missile performance.  
(b) Discuss the features of Surface to air missile and air to surface missile. [8+8]
5. What are refractory metals and their properties? Where these metals are used and why? For selecting a material for the structure of missiles and rockets, what considerations the designer has to take? [16]
6. (a) What do you mean by impulsive shot? Derive the expression for velocity of a rocket as a function of time for zero initial velocity.  
(b) Draw a suitable set of curves showing dimensionless ideal velocity of a rocket as a function of payload ratio and structural efficiency. [10+6]
7. (a) Derive the expression for the stability derivatives of a missile with rear controls.  
(b) Discuss the role of wing, body and tail to the directional stability and control of a missile. [8+8]
8. Write notes on the following with respect to the thrust vector control in case of liquid propellant rockets: Injection of secondary fluid, Jet vanes, Hinge or gimble scheme, Turbine exhaust gas. [16]

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**Set No. 4**

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8. What are refractory metals and their properties? Where these metals are used and why? For selecting a material for the structure of missiles and rockets, what considerations the designer has to take? [16]

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**RR**

**Set No. 1**

**III B.Tech II Semester Examinations, APRIL 2011**  
**ROCKETS AND MISSILES**  
**Aeronautical Engineering**

**Time: 3 hours**

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**All Questions carry equal marks**

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(b) Draw a suitable set of curves showing dimensionless ideal velocity of a rocket as a function of payload ratio and structural efficiency. [10+6]

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