Code No: D7610 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH II - SEMESTER EXAMINATIONS, APRIL/MAY 2012
ROCKET & SPACECRAFT PROPULSION
(AEROSPACE ENGINEERING)

Time: 3hours **Max. Marks: 60**

Answer any five questions
All questions carry equal marks
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1.a) Differentiate between single and multistage rockets mentioning their relative advantages and applications.
b) How are the rockets classified based on propulsion system? Explain about rocket engine performance.

2.a) How is the thrust produced in a rocket motor calculated?
b) What is the relation between burning rate and pressure produced in rocket motor?

3.a) Differentiate between Cartridge-loaded grain and Case-bonded grain used in solid rockets.
b) Describe the methods of attitude control and maneuvers in solid motor rockets.

4.a) What are the various liquid propellants used in practice? Explain about storable liquid propellants.
b) Describe the different propellant feed systems and their performance.

5.a) What are the various shapes of tanks designed for optimum utility of liquid propellant rockets?
b) What are the various factors to be considered in the design of the engines of liquid propellant rockets for maneuvering and orbit adjustments?

6.a) Describe the performance analysis and grain configuration of hybrid propellant rockets.
b) Explain optimum flight performance of Electric Propulsion Rockets.

7.a) Differentiate between Radio frequency thrusters and low power electric thrusters.
b) Describe the principle of Nuclear thermal propulsion and performance of nuclear rocket engines.

8. Answer the following.
a) Nuclear propelled mission
b) Radioactive thermal generators
c) Space shuttle main engine.

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