R09

Code No: C7608

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH I SEMESTER EXAMINATIONS, APRIL/MAY-2012
AIR-BREATHING PROPULSION
(AEROSAPCE ENGINEERING)

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

Answer any five questions
All questions carry equal marks
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1. Classify various aero engines currently in use. Discuss the ideal and real cycle analyses in case of a turbojet engine with after burner facility.

2. Mention the need for developing a converging-diverging nozzle. Discuss the affect of pressure ratios on engine performance and the use of a nozzle with variable exit area.

3. Describe various types of combustion chambers in use with a gas turbine. Use neat diagrams for proper explanation. What are the problems associated with flame stabilization during the combustion process, and the methods to achieve stable flame during the combustion?

4. Discuss in detail the basic operation of a centrifugal compressor. Explain various considerations that need attention while designing the impeller of a centrifugal compressor.

5. Write short notes on the following:
   a) Integrated ramjet-rocket systems
   b) Nozzle less solid propellant rockets

6. Explain the need to develop hypersonic air-breathing propulsive devices. Write a detailed note on the development of SCRAM jet engines and the problems associated with its combustion process.

7. What are the major consideration that one should pay attention to while designing aero engine components like rotating machinery, combustion systems, inlets and exhaust nozzles?

8. Write a detailed note on cycle analysis of one- and two- spool engines.

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