



Reg. No. :

Name :

**Eighth Semester B.Tech. Degree Examination, November 2015
(2008 Scheme)**

08.806.1 : PROPULSION ENGINEERING (MPU)

Time : 3 Hours

Max. Marks : 100

Instruction : Answer *all* questions from Part – A and *one* question from *each* Module of Part – B.

PART – A

1. Explain the principle of jet propulsion. Why propellers cannot be used for subsonic vehicles ?
2. Briefly explain any two inlet ducts used in aircraft engines with sketch. Give the reasons the design is so critical.
3. Distinguish between pressure thrust and momentum thrust applied to jet engine.
4. Explain various component efficiency of a turbojet engine.
5. Compare the suitability of axial compressors and centrifugal compressors for aircraft engines.
6. Explain about thrust augmentation.
7. Explain about nuclear rocket engines.
8. Distinguish between neutral, progressive and regressive burning of solid propellant grain.
9. Differentiate between composite propellants and double base propellants.
10. Explain single staging and multistaging of Rockets. (10×4=40 Marks)



P.T.O.

**PART – B****Module – I**

11. a) Explain Pulsejet engine with a neat sketch. How it is differ from Scramjet engine ? 8
- b) Compare the performance characteristics of Turbojet, Turbofan and Turboprop engines. 12
12. a) Derive an expression for propulsive power and overall efficiency of an engine. 12
- b) Explain with a neat sketch the working of a Turboshaft engine. 8

Module – II

13. a) Explain with sketch the working aircraft combustion chamber. Discuss the advantage and disadvantage of different types of combustion chambers. 10
- b) Explain various components of turbojet with H-S diagram. 10
14. A turbojet engine propelles an aircraft at a speed of 900 km/hr., when it develops a thrust of 14 kN. The air in take to the engine is 50 kg/s and its air-fuel ratio is 85. The calorific value of fuel supplied to the engine is 44000 kJ/kg. The isentropic enthalpy change in the nozzle is 150 kJ/kg. Find the thrust, thrust power, propulsive power, propulsive efficiency, thermal efficiency and overall efficiency of the engine. 20

Module – III

15. a) Describe the ignition process in both liquid and solid propellant rockets. 8
- b) Explain various injectors used in liquid propellant rocket with sketches. 12
16. a) Explain with sketches different grain configurations of solid propellants. 12
- b) Sketch and explain the turbo pump feed system of liquid propellant rocket. 8

