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E – 2405

Reg. No. : .....

Name : .....

**Eighth Semester B.Tech. Degree Examination, May 2018  
(2013 Scheme)**

**13.806.12 : PROPULSION ENGINEERING (MP)**

Time : 3 Hours

Max. Marks : 100

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

**PART – A**

1. What is diffusion factor ?
2. Define degree of reaction in a stage.
3. What do you mean by stage loading ?
4. What are stage parameters ?
5. Define velocity ration in turbines.
6. What is critical Mach number ?
7. Give any two advantages of Turbofan engine.
8. Write any two limitations of liquid propellant rockets.
9. Write the working principle of nuclear rockets.
10. List any two applications of electrical propulsion. **(10×2=20 Marks)**

**PART – B**

**Module – I**

11. a) Derive the equation for work done and pressure rise in the compressor using Euler's turbomachinery equations. **10**
- b) Explain with the neat diagrams about pulsejet engines. **10**

**OR**

**P.T.O.**



12. a) Explain with neat diagrams the cascade airfoil nomenclature. 10  
b) Write short note on : 10  
    i) Diffusion factor  
    ii) Flow coefficient.

**Module – II**

13. a) Explain various applications of turbines in aeronautical industry. 10  
b) Why blade cooling is required in the turbines ? Explain different types of blade cooling methods. 10

OR

14. a) Discuss in detail various performance parameters involved in the design of turbines. 10  
b) Explain all the stage parameters of turbine. 10

**Module – III**

15. a) Explain the advantages and limitations of ramjet engine. 10  
b) Explain with neat diagram the operation of ramjet engine. Also write the applications of ramjet engine. 10

OR

16. a) Explain the role of subcritical, critical and supercritical combustion process in ramjet engines. 10  
b) Explain the different applications of scramjet engines. 10

**Module – IV**

17. a) Differentiate between hybrid, solid and liquid propulsion systems. 10  
b) Describe the following : 10  
    i) Nuclear fusion                      ii) Nuclear fission.

OR

18. a) Explain various performance parameters involved in chemical rockets. 10  
b) Write the applications of electric propulsion and nuclear propulsion systems. 10