Reg. No. : | | | | | | | | | | | | |

Question Paper Code : X 10036

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
Fifth Semester
Aeronautical Engineering
AE 8504 – PROPULSION – II
(Regulations 2017)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. Differentiate ramjet and scramjet engine.
2. State the salient features of scramjet engine.
3. Define specific impulse of a rocket.
4. What are Pulse rocket motors ?
5. Define adiabatic flame temperature.
6. What are the advantages of solid propellant rockets ?
7. State the limitations of hybrid propellant rockets.
8. Name some of the liquid fuel and liquid oxidizer used in liquid propellant rockets.
9. Define electric propulsion rocket engine.
10. Define solar sail.

PART – B **(5×13=65 Marks)**

11. a) With neat sketch briefly explain the operating principle and combustion process involved in Ramjet engine. **(13)**

(OR)

b) Write short notes on :

i) The problems associated with supersonic combustion and explain how to overcome this. **(7)**

ii) The need for supersonic combustion for hypersonic propulsion. **(6)**

12. a) Classify rocket nozzles and explain the concepts of nozzle less propulsion in Rockets. **(13)**

(OR)

b) Explain in detail the two different types of igniters used in solid rocket propulsion. **(13)**

13. a) Define combustion instability in rockets and briefly describe the various instabilities associated with solid propellants. **(13)**

(OR)

b) Briefly describe the salient features of solid propellant rocket with a neat sketch and explain the steps involved in selection of solid propellants. **(13)**

14. a) With neat sketch explain the different feed system used in liquid propellant rocket engines. **(13)**

(OR)

b) Write short notes on :

i) The peculiar problems associated with cryogenic engines. **(5)**

ii) Hybrid rocket with a schematic sketch. **(8)**

15. a) Briefly explain the following :

i) Electric rocket propulsion. **(7)**

ii) Ion rocket propulsion. **(6)**

(OR)

b) Compare the performance of nuclear rocket with chemical rocket propulsion. **(13)**

PART – C **(1×15=15 Marks)**

16. a) Briefly describe the current developments in advanced propulsion systems for rockets worldwide. **(15)**

(OR)

b) Compare the operating principle of a Scramjet and Liquid Propellant Rocket engines and briefly describe the combustion process involved in both engines. **(15)**

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