

Unit 9 - Week 7: Solid, Liquid & Composite Propellant Rocket Engine, Burning and Flame Structure

Course outline

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Week 1: Introduction to Rocket Engines & Governing Equations

Week 2: Thermochemistry, Thrust Equation & Performance Parameters of Rocket Engine

Week 3: Nozzle Characteristics

Week 4: Characteristic Parameters of Rocket Nozzle

Week 5: Flight Trajectory & Elements of Orbital Mechanics

Week 6: Types of Propellant & its Selection, Multi-staging of rocket and SRPE

Week 7: Solid, Liquid & Composite Propellant Rocket Engine, Burning and Flame Structure

● Lesson 31: Classification of Liquid Propellants

● Lesson 32: Solid Propellant Rocket Engine

○ Lesson 33: Propellant Burning Mechanism & Flame Structure

● Lesson 34: Composite Propellant Combustion

● Lesson 35: Regression Rate of Solid Propellant & Effect of Operating Parameters

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Week 8: Solid Propellants: Characteristics & Regression Rate Relation

Week 9: Evolution of Burning surface, Ignition System of Solid Propellant Grains, Types of Liquid Propellant Rocket Engine and Injection System

Week 10: Liquid Propellant Rocket Engines: Injection system, Atomization, Combustion Process and Feed System

Week 11: Feed System, Ignition System, Combustion Instability & Cooling System in LPRE

Week 12: Hybrid Propellant Rocket Engine and Non-chemical Rocket Engine

Week 7: Assignment

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-09-18, 23:59 IST.

1) At low pressure, regression rate is controlled by diffusion flame. Given statement is:

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Accepted Answers:
False

2) Hypergolic liquid propellants are self-igniting in nature. Given statement is:

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Accepted Answers:
True

3) Liquid O₂/liquid H₂ are categorized as high energy liquid propellants. Given statement is:

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Accepted Answers:
True

4) Chamber thickness is higher for solid propellant rocket engine as compared to the liquid propellant rocket engine. Given statement is:

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Accepted Answers:
False

5) Pressure index can never be less than zero. Given statement is:

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Accepted Answers:
False

6) Methyl nitrate is a type of non-hypergolic liquid propellant. Given statement is:

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Accepted Answers:
True

7) Burning rate of solid propellant depends on chamber condition and propellant composition. Given statement is:

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Accepted Answers:
True

8) F/Ox ratio cannot be controlled in liquid propellant rocket engine. Given statement is:

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Accepted Answers:
False

9) Regression rate increases with particle size of oxidizer in composite propellant. Given statement is:

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Accepted Answers:
False

10) Pressure index (n) is lower for double base as compared to composite propellant. Given statement is:

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Accepted Answers:
True

11) The pressure index n can be modified by varying rate of chemical reactions in:

1 point

- Heat conduction zone
 Foam zone
 Fizz zone
 Dark zone

No, the answer is incorrect.
Score: 0

Accepted Answers:
Fizz zone

12) Dark zone disappears for chamber pressure (P_c)

1 point

- > 7 MPa
 < 7 MPa
 > 9 MPa
 < 9 MPa

No, the answer is incorrect.
Score: 0

Accepted Answers:
> 7 MPa

13) Identify the correct statement with respect to the burning rate of solid rocket propellant:

1 point

- Pressure index value is always greater than zero for plateau burning.
 Pressure index value is less than zero for mesa burning.
 Pressure index value is greater than zero for mesa burning.
 Pressure index value is always less than zero for plateau burning.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Pressure index value is less than zero for mesa burning.

14) Which of the following is an example of hypergolic liquid mono-propellant system:

1 point

- C₇H₁₄O₂
 CH₃NO₃
 LO₂
 N₂H₄

No, the answer is incorrect.
Score: 0

Accepted Answers:
N₂H₄

15) Which of the following propellant is having medium range of I_{sp} value (300-400s):

1 point

- UDMH/N₂O₄
 N₂H₄
 UDMH/LO₂
 LH₂/LO₂

No, the answer is incorrect.
Score: 0

Accepted Answers:
UDMH/LO₂