1. Which law of thermodynamics primarily governs the energy conversion process in turbo machines?

a) First Law
b) Second Law
c) Third Law
d) Zeroth Law

Answer: b) Second Law

Explanation: The Second Law of Thermodynamics governs the direction and efficiency of energy conversion processes in turbo machines, ensuring that energy transfers occur with certain limitations such as entropy increase.

2. The moment of momentum equation is commonly applied to analyze the:

a) Thermodynamic cycles
b) Fluid flow through turbo machines
c) Electrical circuits
d) Mechanical structures

Answer: b) Fluid flow through turbo machines

Explanation: The moment of momentum equation is used to analyze the fluid flow behavior within turbo machines, providing insights into the forces and moments acting on the fluid.

3. What does the Euler turbine equation describe?

a) Conservation of mass in turbo machines
b) Conversion of kinetic energy into mechanical work
c) Variation of pressure along the streamline
d) Relationship between moment of momentum and fluid flow rate

Answer: b) Conversion of kinetic energy into mechanical work

Explanation: The Euler turbine equation relates the change in kinetic energy of the fluid to the mechanical work done by the turbine, providing a fundamental understanding of energy conversion within turbines.

4. Impulse turbines primarily operate based on which principle?

a) Conservation of energy
b) Newton’s third law of motion
c) Bernoulli’s principle
d) Law of inertia

Answer: b) Newton’s third law of motion

Explanation: Impulse turbines operate based on the principle of action and reaction, as described by Newton’s third law of motion, where the change in momentum of the fluid results in an equal and opposite force on the turbine blades.

5. What does the degree of reaction indicate in turbo machines?

a) Efficiency of the machine
b) Ratio of static pressure to total pressure

c) Amount of energy conversion
d) Distribution of kinetic energy

Answer: c) Amount of energy conversion

Explanation: The degree of reaction in turbo machines indicates the proportion of the total energy conversion that occurs in the rotor. It provides insights into how much of the available energy is converted within the machine.

6. The energy equation for relative velocities in turbo machines primarily accounts for:

a) Frictional losses
b) Heat transfer
c) Pressure variation
d) Angular momentum

Answer: a) Frictional losses

Explanation: The energy equation for relative velocities accounts for losses due to friction within the turbo machine, which affect the efficiency and performance of the machine.

7. In one-dimensional analysis of turbo machines, which parameter remains constant along the streamline?

a) Velocity
b) Pressure
c) Density
d) Temperature

Answer: d) Temperature

Explanation: In one-dimensional analysis, temperature remains relatively constant along the streamline within turbo machines, assuming adiabatic and isentropic processes.

8. Which law of thermodynamics primarily governs the energy transfer process in reaction turbines?

a) First Law
b) Second Law
c) Third Law
d) Zeroth Law

Answer: a) First Law

Explanation: The First Law of Thermodynamics governs the energy transfer process in reaction turbines, accounting for the conservation of energy during fluid flow and energy conversion.

9. What does the moment of momentum equation primarily describe in turbo machines?

a) Conservation of angular momentum
b) Variation of fluid density
c) Turbulent flow behavior
d) Static pressure distribution

Answer: a) Conservation of angular momentum

Explanation: The moment of momentum equation describes the conservation of angular momentum within turbo machines, providing insights into the forces and moments acting on the fluid as it flows through the machine.

10. The principle of impulse in turbo machines is primarily associated with:

a) Continuous flow of fluid
b) Steady-state operation
c) Change in momentum
d) Variation in pressure

Answer: c) Change in momentum

Explanation: The principle of impulse in turbo machines is associated with the change in momentum of the fluid as it passes through the machine, resulting in the generation of mechanical work.

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