

1. Which type of machine is primarily classified based on pressure rise and flow mechanism?

- a) Centrifugal Blowers
- b) Axial Flow Compressors
- c) Positive Displacement Compressors
- d) Reciprocating Compressors

Answer: b) Axial Flow Compressors

Explanation: Axial flow compressors are classified based on pressure rise and flow mechanism, as they utilize axial motion to compress the fluid.

2. What parameter is used to define the vane shape in centrifugal blowers?

- a) Thickness ratio
- b) Camber angle
- c) Aspect ratio
- d) Chord length

Answer: b) Camber angle

Explanation: The vane shape in centrifugal blowers is defined by the camber angle, which determines the curvature of the vanes.

3. What is the primary function of the velocity triangle in turbomachinery?

- a) To calculate slip coefficient
- b) To determine degree of reaction

- c) To analyze flow velocities
- d) To estimate compressor efficiency

Answer: c) To analyze flow velocities

Explanation: The velocity triangle helps in analyzing the flow velocities and their components within turbomachinery.

4. What is the primary factor affecting the slip coefficient in centrifugal compressors?

- a) Blade angle
- b) Mach number
- c) Blade curvature
- d) Compressor speed

Answer: b) Mach number

Explanation: The slip coefficient in centrifugal compressors is primarily affected by the Mach number, which indicates the ratio of actual velocity to the theoretical velocity.

5. In centrifugal blowers, what characteristic determines the size and speed of the machine?

- a) Vane shape
- b) Degree of reaction
- c) Flow rate
- d) Inlet pressure

Answer: c) Flow rate

Explanation: The flow rate determines the size and speed of the centrifugal blower, as it dictates the amount of fluid that needs to be handled.

6. What is the primary parameter used to measure the performance of a centrifugal compressor?

- a) Efficiency
- b) Slip coefficient
- c) Degree of reaction
- d) Pressure rise

Answer: a) Efficiency

Explanation: Efficiency is the primary parameter used to measure the performance of a centrifugal compressor, indicating how effectively it converts input power into useful work.

7. Which law describes the relationship between fan speed, flow rate, and pressure rise in centrifugal blowers?

- a) Boyle's Law
- b) Charles's Law
- c) Fan Laws
- d) Bernoulli's Principle

Answer: c) Fan Laws

Explanation: The Fan Laws describe the relationship between fan speed, flow rate, and pressure rise in centrifugal blowers, providing insights into how changes in one parameter

affect the others.

8. What phenomenon occurs when an axial flow compressor operates beyond its stable operating range?

- a) Choking
- b) Surging
- c) Stall
- d) Stagnation

Answer: b) Surging

Explanation: Surging occurs when an axial flow compressor operates beyond its stable operating range, leading to flow reversal and unstable performance.

9. Which efficiency factor compares the actual work done with the work done under isentropic conditions in centrifugal compressors?

- a) Polytrophic efficiency
- b) Isentropic efficiency
- c) Mechanical efficiency
- d) Adiabatic efficiency

Answer: b) Isentropic efficiency

Explanation: Isentropic efficiency compares the actual work done with the work done under isentropic conditions, providing a measure of how closely the compressor approaches ideal performance.

10. What is the primary purpose of vector diagrams in centrifugal compressors?

- a) To calculate slip factor
- b) To analyze compressor blade angles
- c) To determine inlet pressure
- d) To estimate discharge temperature

Answer: b) To analyze compressor blade angles

Explanation: Vector diagrams in centrifugal compressors are primarily used to analyze compressor blade angles, aiding in understanding the flow dynamics within the compressor.

11. What parameter represents the pressure rise capability of a centrifugal compressor?

- a) Mach number
- b) Degree of reaction
- c) Pressure coefficient
- d) Slip factor

Answer: c) Pressure coefficient

Explanation: The pressure coefficient represents the pressure rise capability of a centrifugal compressor, indicating how much pressure increase occurs across the compressor.

12. Which efficiency factor compares the actual work done with the work input to the compressor in centrifugal compressors?

- a) Polytrophic efficiency

- b) Isentropic efficiency
- c) Mechanical efficiency
- d) Adiabatic efficiency

Answer: c) Mechanical efficiency

Explanation: Mechanical efficiency compares the actual work done with the work input to the compressor, providing insights into the mechanical losses within the system.

13. What parameter is used to quantify the degree of reaction in axial flow compressors?

- a) Pressure ratio
- b) Mach number
- c) Velocity ratio
- d) Temperature ratio

Answer: c) Velocity ratio

Explanation: The velocity ratio is used to quantify the degree of reaction in axial flow compressors, representing the ratio of change in velocity across the rotor to the inlet velocity.

14. Which characteristic defines the stability range of an axial flow compressor?

- a) Stall
- b) Surge
- c) Efficiency
- d) Mach number

Answer: a) Stall

Explanation: Stall defines the stability range of an axial flow compressor, indicating the point at which flow separation occurs and performance deteriorates.

15. What type of analysis is commonly used to understand the performance characteristics of axial flow compressors?

- a) Dimensional Analysis
- b) Computational Fluid Dynamics (CFD)
- c) Finite Element Analysis (FEA)
- d) Monte Carlo Simulation

Answer: a) Dimensional Analysis

Explanation: Dimensional Analysis is commonly used to understand the performance characteristics of axial flow compressors, helping to identify relevant parameters and their relationships without detailed numerical simulations.

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