1. What type of turbine is most suitable for high head, low flow rate conditions?

a) Pelton turbine
b) Francis turbine
c) Kaplan turbine
d) Centrifugal pump

Answer: b) Francis turbine

Explanation: Francis turbines are known for their versatility and are commonly used in medium to high head and medium flow rate conditions. They can efficiently operate under varying head and flow conditions, making them suitable for a wide range of hydroelectric power generation applications.

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2. Which type of turbine utilizes the impulse principle for energy conversion?

a) Pelton turbine
b) Francis turbine
c) Kaplan turbine
d) Centrifugal pump

Answer: a) Pelton turbine

Explanation: Pelton turbines are impulse turbines that convert the kinetic energy of a high-velocity jet of water into mechanical energy by directing the water onto buckets mounted on

the periphery of a wheel.

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3. What component of a water turbine is responsible for increasing the velocity of water exiting the turbine?

a) Draft tube
b) Runner
c) Guide vanes
d) Casing

Answer: a) Draft tube

Explanation: The draft tube is a component of a water turbine that helps in efficiently discharging water from the turbine, by gradually decreasing its velocity and increasing the pressure. This ensures that the turbine operates at atmospheric pressure and improves its efficiency.

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4. Which type of pump has a continuous flow of fluid through its rotating impeller?

a) Reciprocating pump
b) Centrifugal pump
c) Diaphragm pump

d) Gear pump

Answer: b) Centrifugal pump

Explanation: Centrifugal pumps utilize a rotating impeller to impart kinetic energy to the fluid, which is then converted into pressure energy as the fluid flows through the pump casing. Unlike reciprocating pumps, centrifugal pumps provide a continuous flow of fluid.

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5. What is the term for the total head against which a pump operates, including both static and dynamic heads?

a) Gross head
b) Manometric head
c) Static head
d) Dynamic head

Answer: a) Gross head

Explanation: Gross head represents the total head against which a pump operates and includes both static head (elevation difference) and dynamic head (pressure difference).

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6. In a centrifugal pump, what component converts mechanical energy from the motor into

kinetic energy of the fluid?

a) Impeller
b) Casing
c) Diffuser
d) Volute

Answer: a) Impeller

Explanation: The impeller is the rotating component of a centrifugal pump responsible for converting mechanical energy from the motor into kinetic energy of the fluid by accelerating the fluid radially outward.

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7. What is the primary advantage of a centrifugal pump over a reciprocating pump?

a) Higher efficiency
b) Lower initial cost
c) Better suction capability
d) Smaller footprint

Answer: d) Smaller footprint

Explanation: Centrifugal pumps generally have a smaller footprint compared to reciprocating pumps, making them more suitable for installations where space is limited. Additionally, centrifugal pumps offer continuous flow and require less maintenance.

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8. Which parameter represents the efficiency of a pump in converting mechanical power into hydraulic power?

a) Hydraulic efficiency
b) Volumetric efficiency
c) Mechanical efficiency
d) Overall efficiency

Answer: a) Hydraulic efficiency

Explanation: Hydraulic efficiency of a pump represents the ratio of hydraulic power output to the mechanical power input, indicating how effectively the pump converts mechanical power into hydraulic power.

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9. What phenomenon occurs when vapor bubbles form and collapse within a pump due to low pressure regions?

a) Cavitation
b) Viscous drag
c) Erosion
d) Water hammer

Answer: a) Cavitation

Explanation: Cavitation is the formation and subsequent collapse of vapor bubbles within a pump or hydraulic system due to low pressure regions. It can lead to damage to pump components and reduced pump performance.

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10. Which characteristic distinguishes a Kaplan turbine from other types of water turbines?

a) Utilizes a draft tube
b) Suitable for low head applications
c) Uses adjustable blades
d) Operates solely on the impulse principle

Answer: c) Uses adjustable blades

Explanation: Kaplan turbines are characterized by their adjustable blades, which allow for efficient operation across a wide range of flow rates and heads. This feature distinguishes them from other types of water turbines.

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11. What is the primary governing parameter used to control the speed of a water turbine?

a) Flow rate

b) Head
c) Power output
d) Blade angle

Answer: c) Power output

Explanation: The power output of a water turbine is the primary governing parameter used to control its speed. Governing mechanisms adjust the flow rate or blade angle to maintain a constant power output under varying operating conditions.

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12. Which type of pump is most suitable for high flow rate, low head applications?

a) Centrifugal pump
b) Reciprocating pump
c) Gear pump
d) Axial-flow pump

Answer: a) Centrifugal pump

Explanation: Centrifugal pumps are well-suited for high flow rate, low head applications due to their ability to efficiently impart kinetic energy to the fluid and maintain a continuous flow.

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13. What is the primary function of a draft tube in a water turbine?

a) Increases the velocity of water
b) Decreases the pressure of water
c) Improves the efficiency of the turbine
d) Guides the flow of water exiting the turbine

Answer: c) Improves the efficiency of the turbine

Explanation: The draft tube in a water turbine helps to improve the efficiency of the turbine by gradually decreasing the velocity of water exiting the turbine and increasing its pressure, allowing for more effective energy transfer.

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14. What is the term for the pressure head due to the elevation of a fluid above a reference point?

a) Gross head
b) Manometric head
c) Static head
d) Dynamic head

Answer: c) Static head

Explanation: Static head refers to the pressure head due to the elevation of a fluid above a reference point. It represents the potential energy of the fluid at rest.

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15. Which efficiency parameter accounts for losses due to friction and internal leakage within a pump?

a) Hydraulic efficiency
b) Volumetric efficiency
c) Mechanical efficiency
d) Overall efficiency

Answer: c) Mechanical efficiency

Explanation: Mechanical efficiency of a pump accounts for losses due to friction and internal leakage within the pump, indicating how effectively mechanical power is transmitted to the fluid.

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