

Unit 5 – Knowledge Check

1. What is the main function of an inverter?

- Convert AC to DC
- Convert DC to AC

(Correct answer)

Inverters are specifically designed to convert DC power from sources like batteries or solar panels into AC power, which is the standard form of electricity used in homes, industries, and most appliances.

- Store electrical energy
- Generate electricity

2. Which type of inverter is most commonly used in solar power systems?

- Voltage Source Inverter (VSI)

(Correct answer)

Voltage Source Inverters (VSIs) are widely used in solar applications because they efficiently convert DC to AC, while also regulating the voltage to match the needs of household appliances or the electrical grid.

- Current Source Inverter (CSI)
- Hybrid Inverter
- Linear Inverter

3. Inverters are only used in renewable energy systems.

- True
- False

(Correct answer)

Inverters are versatile devices used not only in renewable energy systems but also in electric vehicles, motor drives, and backup power systems (UPS). They play a key role in converting power for various applications.

4. In an electric vehicle, what is the role of the inverter?

- Convert AC power from the motor to DC power for the battery
- Convert DC power from the battery to AC power for the motor

(Correct answer)

Most electric vehicle motors run on AC power, so the inverter is needed to convert the DC power from the vehicle's battery into AC, allowing the motor to function properly.

- Store excess energy during braking
- Generate electricity from solar panels

5. What type of current is typically produced by solar panels?

- Alternating Current (AC)
- Direct Current (DC)

(Correct answer)

Solar panels generate DC power because the photovoltaic cells produce a consistent flow of electricity in one direction. Inverters are then used to convert this DC power into AC for use in homes and on the grid.

- Pulsating Current
- Three-phase Current

6. Which component is essential for converting DC from a solar panel into AC for home use?

- Transformer
- Rectifier
- Inverter

(Correct answer)

The inverter is the key component that transforms DC electricity from the solar panels into AC power, making it compatible with household appliances and the electrical grid.

- Battery

7. How do inverters contribute to energy efficiency in electric vehicles?

- By increasing the voltage of the battery
- By converting power and managing regenerative braking

(Correct answer)

Inverters in electric vehicles manage the power flow between the battery and the motor. During regenerative braking, the inverter captures the energy generated by braking and sends it back to recharge the battery, improving overall efficiency.

- By storing solar energy directly

- By controlling the speed of the wheels

8. Which of the following is NOT a typical application of inverters?

- Solar power systems
- Electric vehicle powertrains
- Household lighting circuits

(Correct answer)

Household lighting circuits typically use AC power directly from the grid and do not require an inverter. Inverters are mainly used in systems where DC power needs to be converted to AC, such as in solar installations, EVs, and UPS.

- Uninterruptible Power Supplies (UPS)

9. In renewable energy systems, what is the main purpose of the inverter?

- To store DC power in the battery
- To convert DC power from the source to AC power for the grid

(Correct answer)

In renewable systems like solar or wind, the power generated is DC. Inverters are used to convert this DC power into AC so it can be fed into the electrical grid or used directly in AC appliances.

- To regulate temperature of the system
- To increase the output of solar panels

10. An inverter can only convert power in one direction.

- True
- False

(Correct answer)

In many applications, such as electric vehicles, inverters can handle bidirectional power conversion. This means they can convert DC to AC during normal operation and also convert AC back to DC during regenerative braking, returning energy to the battery.