

Assessments for ASEEN Solar Energy Curriculum

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1) Answer: _____

How many Joules are in 1 kW-h?

- A. 1.2 MJ
- B. 3.1 MJ
- C. 3.6 MJ
- D. 0.7 MJ

2) Answer: _____

Work is measure in units of:

- A. Watts
- B. Amps
- C. Joules
- D. Volts

3) Answer: _____

What type of battery is best suited for PV systems using inverters?

- A. Starting batteries
- B. Deep cycle batteries

4) Answer: _____

In electronics, a terminal that supplies (receives) electrons is:

- A. cathode (anode)
- B. anode (cathode)

5) Answer: _____

The kW-h is a unit of:

- A. Power
- B. Energy
- C. Voltage
- D. Current

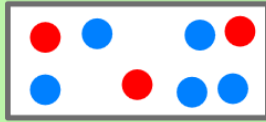
6) Answer: _____

Given multiple batteries, to obtain the most voltage connect them in:

- A. Series
- B. Parallel
- C. Combination of both

7) Answer: _____

If blue is positive charge and red is negative charge, the following object is:



- A. Positive
- B. Negative
- C. Neutral
- D. Insufficient information

8) Answer: _____

As charge flows through a resistor:

- A. Fewer electrons exit the resistor
- B. Heat is dissipated
- C. Electrons become less energetic
- D. B and C

9) Answer: _____

A positive (negative) ion has:

- A. excess (shortage) of negative charge
- B. shortage (excess) of negative charge
- C. Neither

10) Answer: _____

"Bypass diodes" are utilized to prevent solar cell damage due to:

- A. Excessive heating
- B. Rain
- C. Cold
- D. Shading

11) Answer: _____

DC (AC) power systems were developed by:

- A. Thomas Edison (Nikola Tesla)
- B. Nikola Tesla (Thomas Edison)
- C. Both by Albert Einstein
- D. Irwin Schrodinger (Michael Faraday)

12) Answer: _____

Voltage is defined as:

- A. Heat dissipation
- B. Electron flow
- C. Impedance to current
- D. Energy per unit of charge

13) Answer: _____

Ionization occurs when:

- A. Sunlight hits a solar cell
- B. A rubber rod is rubbed onto fur
- C. Dragging your feet on carpet
- D. All of the above

14) Answer: _____

The Sun powers:

- A. the Wind
- B. the Weather
- C. Ocean currents
- D. All of the above

15) Answer: _____

Ionization is the process responsible for:

- A. resistance
- B. dissipation of heat
- C. voltage
- D. atoms losing or gaining electrons

16) Answer: _____

Solar (photovoltaic) cells produce what type of voltage and current?

- A. DC
- B. AC
- C. Can produce either

17) Answer: _____

Conductors are materials which have:

- A. Few free electrons
- B. No free electrons
- C. Many free electrons
- D. Number of electrons is irrelevant

18) Answer: _____

Which is the best conductor?

- A. Silver
- B. Copper
- C. Aluminum
- D. Cobalt

19) Answer: _____

Solar (Photovoltaic) cells come in the following types:

- A. Bulk
- B. Translucent
- C. Thin-film
- D. A and C

20) Answer: _____

Concentrating Solar Power Systems produce electricity using:

- A. Light from sunlight
- B. Heat from sunlight
- C. Can do either

21) Answer: _____

DC (AC) power systems deliver:

- A. Alternating (constant) voltage and current
- B. Constant (alternating) voltage and current

22) Answer: _____

In the Bohr Atomic Model, the atomic number (Z) denotes:

- A. the number of neutrons
- B. the number of electrons and protons
- C. the number of protons
- D. the number of shells

23) Answer: _____

For a battery bank, to produce a desired system voltage level and capacity:

- A. Combine batteries in series
- B. In parallel
- C. A combination of series and parallel

24) Answer: _____

Semiconductors are materials which have:

- A. Few free electrons
- B. No free electrons
- C. Many free electrons
- D. Fewer free electrons than conductors and 4 valence electrons in their structure

25) Answer: _____

What type of battery is best suited as a back-up generator?

- A. Starting batteries
- B. Deep cycle batteries

26) Answer: _____

To send back unused electricity to the standard power line, the following PV system is needed:

- A. Grid-tied PV system
- B. Non Grid-tied PV system
- C. Insufficient information

27) Answer: _____

Power is:

- A. the flow of electrons
- B. energy
- C. heat
- D. the rate of doing work

28) Answer: _____

Which type of photovoltaic cell has a higher conversion efficiency?

- A. Polycrystalline silicon
- B. Monocrystalline silicon
- C. Amorphous silicon
- D. Thin-film silicon

29) Answer: _____

AC power systems are best for:

- A. Storing power over time
- B. Transmitting power over short distances
- C. Transmitting power over long distances
- D. Dispersing energy rapidly

30) Answer: _____

In the Bohr Atomic Model, the outermost electron shell is:

- A. The conductance shell
- B. Faraday's shell
- C. The valence shell
- D. The osmosis shell

31) Answer: _____

A Power Inverter:

- A. Converts AC power to DC
- B. Converts DC power to AC
- C. Can be programmed for either conversion

32) Answer: _____

Current (2015) solar cells convert sunlight into electricity at an efficiency of:

- A. 55%
- B. 5%
- C. 14%
- D. 5% to 24%

33) Answer: _____

Work is:

- A. Energy
- B. Flow of charge
- C. Act of energy transfer
- D. A and C

34) Answer: _____

Amount of solar power per surface area striking the Earth's surface:

- A. 10 W/m²
- B. 100 W/m²
- C. 1,000 W/m²
- D. 10,000 W/m²

35) Answer: _____

In a PV system, a charge controller does what to a battery?

- A. Regulates battery charge
- B. Protects from overcharge
- C. Protects from overdischarge
- D. All of the above

36) Answer: _____

What are the top challenges relating to solar energy?

- A. Not enough sunshine
- B. Increasing solar cell efficiency
- C. Energy storage
- D. B and C

37) Answer: _____

Which is true?

- A. Batteries store electrons
- B. Batteries store kinetic energy
- C. Batteries store chemical energy
- D. All of the above

38) Answer: _____

If an atom absorbs a photon with sufficient energy to knock out two electrons, it is left with charge:

- A. $-1e$
- B. $-2e$
- C. $+1e$
- D. $+2e$

39) Answer: _____

Insulators are materials which have:

- A. Few free electrons
- B. No free electrons
- C. Many free electrons
- D. Number of electrons is irrelevant

40) Answer: _____

When there is no voltage difference across a wire:

- A. Free electrons move in one way and positive ions the other direction
- B. All charge moves randomly
- C. Charge remains fixed
- D. It depends on the length of the wire

41) Answer: _____

What physics principle allows solar cells to convert sunlight into electricity?

- A. Kirchhoff's voltage rule
- B. Brownian motion
- C. Faraday's Law
- D. The Photovoltaic Effect

42) Answer: _____

Given multiple batteries, to obtain the most current connect them in:

- A. Series
- B. Parallel
- C. Combination of both

43) Answer: _____

A single cell battery can produce any voltage depending on quantities of reactants used:

- A. True
- B. False

44) Answer: _____

Atoms are naturally:

- A. Positively charged
- B. Negatively charged
- C. Neutral
- D. None of the above

45) Answer: _____

The most abundant source of energy is:

- A. Uranium
- B. the Sun
- C. Natural Gas
- D. Coal

46) Answer: _____

Electrons in the valence shell are responsible for:

- A. impedance
- B. chemical reactions
- C. electrical and thermal conductivity
- D. B and C

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