**TOSS-UP**

1) ENERGY *Short Answer* What is the name of the electrical component which is a conductor, usually a coil of wire, that stores energy in a magnetic field in response to the current through it?

ANSWER: INDUCTOR

**TOSS UP**

2) ENERGY *Multiple Choice* NASA recently contracted with private companies to pursue the design of laser power beaming systems to power low earth orbit satellites. What type of transmission is being pursued?

W) Resonant Magnetic Induction

X) Single Wire Earth Return

Y) Electromagnetic Radiation

Z) Superconductive

ANSWER: Y) ELECTROMAGNETIC RADIATION

**TOSS-UP**

3) ENERGY *Short Answer* By name or number, denote which of the following 4 statements is or are NOT true of biodiesel.

1: Biodiesel has better lubricating properties and much higher cetane ratings than today's lower sulfur diesel fuels.  
2: Animal fats, algae, and soybean oil are all used to produce biofuels. 3: Recently, alligator fat was identified as a source to produce biodiesel.  
4: A biodiesel blend with 80% petroleum diesel is labeled B80.

ANSWER: 4 ONLY

**TOSS UP**

4) ENERGY *Short Answer* Which chemical process, used in natural gas processing, is used to recover sulfur from gaseous hydrogen sulfide?

ANSWER: CLAUS PROCESS

**TOSS-UP**

5) ENERGY *Short Answer* By name or number, denote which of the following 4 statements is or are true of fracking.

1: Reservoirs are typically porous sandstones, limestones or dolomite rocks.  
2: Horizontal drilling is primarily used to find gas reserves.   
3: The potential contamination of groundwater is a major risk of fracking.   
4: There are few to no harmful air emissions produced by fracking.

ANSWER: 1 and 3

**TOSS UP**

6) ENERGY *Short Answer* What type of biofuel is produced by the anaerobic digestion or fermentation of biodegradable materials, primarily producing methane and carbon dioxide?

ANSWER: BIOGAS

**TOSS-UP**

7) ENERGY *Short Answer* What class of biofuels are made from lignocellulosic biomass or woody crops, agricultural residues or waste, and are considered more sustainable than sugar or vegetable oil based biofuels?

ANSWER: SECOND GENERATION/ADVANCED BIOFUELS

**TOSS UP**

8) ENERGY *Short Answer* What process, used in the creation of second generation biofuels, involves the thermochemical decomposition of organic material at elevated temperatures without the participation of oxygen?

ANSWER: PYROLYSIS

**TOSS-UP**

9) ENERGY *Short Answer* Denote by name of number all of the following 4 statements which is or are true of solar power.

1: Solar cells convert light into electric current using the photoelectric effect.   
2: Electricity produced through photovoltaic devices is direct current.   
3: Most solar panels have an efficiency of approximately 14%.  
4: Solar panels are expected to function from 10-15 years at max.

ANSWER: 1, 2 and 3

**TOSS UP**

10) ENERGY *Short Answer* What critical component in a photovoltaic system converts the variable DC output of the solar panel into a power line frequency alternating current that can be fed into the commercial electrical grid?

ANSWER: SOLAR INVERTER

**TOSS-UP**

11) ENERGY *Multiple Choice* About what percentage of US electricity is supplied by nuclear power?

W) 15%  
X) 20%  
Y) 25%   
Z) 30%

ANSWER: X) 20%

**TOSS UP**

12) ENERGY *Short Answer* What is the name of the device that includes a mirror, usually a plane mirror, which turns so as to keep reflecting sunlight toward a predetermined target, compensating for the sun's apparent motions in the sky?

ANSWER: HELIOSTAT

**TOSS-UP**

13) ENERGY *Short Answer* State by name or number which of the 4 following statements is or are true of fossil fuels.   
1: Refining coal decreases its calorific value.   
2: Bituminous coal is a relatively hard coal containing a tarlike substance called bitumen.  
3: The product of coking coal is cast iron, which is treated to produce steel.   
4: Coal gasification can be used to produce syngas, a mixture of carbon monoxide and hydrogen gas.

ANSWER: 3, 4

**TOSS UP**

14) ENERGY *Short Answer* What ultra-lightweight flying wing aircraft, developed by NASA, used a combination of solar cells, storage batteries and a modified commercial hydrogen–air fuel cell to reach an altitude of 96,863 feet, 2 miles higher than the previous record?

ANSWER: HELIOS

**TOSS-UP**

15) ENERGY *Short Answer* What phenomenon, atemporary disturbance of the Earth's magnetosphere caused by a disturbance in the interplanetary medium, is caused by a solar wind shock wave which interacts with the Earth's magnetic field?

ANSWER: GEOMAGNETIC STORM

**TOSS UP**

16) ENERGY *Short Answer* Silver, Indium, and Cadmium are all elements which can be used as what nuclear reactor structures, capable of absorbing many neutrons without fissioning themselves?

ANSWER: CONTROL RODS

**TOSS-UP**

17) ENERGY *Multiple Choice* Which project sought to study the possibility of using a series of explosions of atomic bombs behind the craft to propel a spaceship?

W) Project Dedalus   
X) Project Orion  
Y) Project Io  
Z) Project Eureka

ANSWER: X) PROJECT ORION

**TOSS UP**

18) ENERGY *Short Answer* What isotope of thorium, used in the thorium based reactors, is transmuted into the fissile artificial uranium isotope 233U which is the nuclear fuel?

ANSWER: THORIUM-232

**TOSS-UP**

19) ENERGY *Short Answer* What type of type of thermal reactor uses normal water as its coolant and neutron moderator?

ANSWER: LIGHT WATER REACTOR