**TOSS-UP**

1) ENERGY *Short Answer* What molecules, obtained from the transesterification of vegetable oils, are the main constituents of biodiesel?

ANSWER: FAME, FATTY ACID METHYL ESTER

**TOSS UP**

2) ENERGY *Multiple Choice* What form of ethanol fuel blend is commonly used by flex-fuel vehicles in the US and Europe?

W) E50

X) E75

Y) E85

Z) E90

ANSWER: Y) E85

**TOSS-UP**

3) ENERGY *Short Answer* State by name or number which of the following types of fuels is or are created by algae based carbohydrate fermentation?

1: Biobutanol 2: Bioethanol 3: Biomethanol  
4: Biopropanol

ANSWER: 1 AND 2

**TOSS UP**

6) ENERGY *Short Answer* Thorium-232, after neutron capture and beta decay, produces what isotope, which would be the product of a theoretical thermal breeder reactor?

ANSWER: URANIUM-233

**TOSS-UP**

7) ENERGY *Short Answer* Denote by name or number which of the following are current types of geothermal power plants.

1: Dry Steam  
2: Flash Steam  
3: Binary Cycle

ANSWER: ALL

**TOSS UP**

8) ENERGY *Short Answer* What collective term for the new system of electricity transmission in the US, as stated by the DOE, seeks to increase energy efficiency by 2%?

ANSWER: SMARTGRID

**TOSS-UP**

9) ENERGY *Short Answer* What technology, a form of biopower, is used to convert organic waste to electricity or heat, through anaerobic digestion?

ANSWER: METHANE RECOVERY

**TOSS UP**

10) ENERGY *Short Answer* What is the power of a 100 kg vehicle accelerating at a constant 5 m/s2, which travels 100 m in 5 seconds?

ANSWER: 10,000 W

**TOSS-UP**

11) ENERGY *Short Answer* Denote by name or number all of the following products which are made from petroleum.

1: Tires 2: Heart Valves 3: Batteries   
4: Jet Fuel

ANSWER: 1, 2 and 4

**TOSS UP**

12) ENERGY *Short Answer* What is the major rock type which is the medium for fracking?

ANSWER: SHALE

**TOSS-UP**

13) ENERGY *Multiple Choice* About what percent of the US’s total electricity comes from nuclear power?

W) 10  
X) 15 Y) 20   
Z) 25

ANSWER: Y) 20

**TOSS UP**

14) ENERGY *Short Answer* From what state does most anthracite coal produced in the US come from?

ANSWER: PENNSYLVANIA

**TOSS-UP**

15) ENERGY *Short Answer* What is the name of the device which transfers electrical energy from one circuit to another through inductively coupled conductors?

ANSWER: TRANSFORMER

**TOSS UP**

16) ENERGY *Multiple Choice* How would you classify a bacteria that derives its energy from inorganic sources such as Hydrogen Sulfide?

W) Chemoheterotroph

X) Chemoautotroph

Y) Photoautotroph  
Z) Photohetereotroph

ANSWER: X) CHEMOAUTOTROPH

**TOSS-UP**

17) ENERGY *Short Answer* Most current wind machines in use are of what type, with blades shaped like airplane propellers, increasing energy output?

ANSWER: HORIZONTAL AXIS

**TOSS UP**

18) ENERGY *Short Answer* Graphite and Heavy Water are examples of what type of medium, which is used to reduce the speed of fast neutrons thereby turning them into thermal neutrons capable of sustaining a nuclear chain reaction?

ANSWER: (NEUTRON) MODERATOR

**TOSS-UP**

19) ENERGY *Multiple Choice* Enriched uranium is a kind of uranium in which the amount of which isotope has been increased through the process of isotope separation?

W) U-233 X) U-235 Y) U-237 Z) U-238

ANSWER: X) U-235

**TOSS UP**

19) ENERGY *Short Answer* What is the form of electromagnetic radiation emitted when a charged particle (such as an electron) passes through a dielectric medium at a speed greater than the phase velocity of light in that medium?

ANSWER: CHERENKOV RADIATION

**TOSS-UP**

22) ENERGY *Short Answer* What element is the primary constituent of crystal lattices in photovoltaic cells?

ANSWER: SILICON

**TOSS UP**

23) ENERGY *Short Answer* Denote all of the following 3 groupings which correctly match the input, refinery process, and output.

1: Naphtha- Reformer- Gasoline

2: Heavy Gas Oil – Cracking Unit – Diesel Fuel

3: Kerosene – Coker - Asphalt

ANSWER: 1 and 2

**TOSS-UP**

24) ENERGY *Short Answer* What law states that the direction of any magnetic induction effect is such as to oppose the cause of the effect?

ANSWER: LENZ’S LAW

**TOSS UP**

25) ENERGY *Short Answer* What newly discovered form of petroleum deposit, abundant in Canada and Venezuela, contain naturally occurring mixtures of sand, clay, water, and a dense and extremely viscous form of petroleum?

ANSWER: OIL SANDS