**TOSS-UP**

1) ENERGY *Short Answer*

ANSWER: 3

**TOSS UP**

2) ENERGY *Multiple Choice* Which of the following would be expected to result from a collision between a continental lithospheric plate, and an oceanic lithospheric plate?

W) Volcanic Island Arc

X) Mid Ocean Ridge

Y) Continental Volcanic Arc

Z) Transform Fault

ANSWER: Y) CONTINENTAL VOLCANIC ARC

**TOSS-UP**

3) ENERGY *Short Answer* State by name or number all of the following 4 processes within the hydrologic cycle in which water absorbs energy.

1: Crystallization of water into ice 2: Condenstion of Water Vapor into a cloud 3: Runoff along the land surface  
4: Evaporation from the ocean surface

ANSWER: 4 ONLY

**TOSS UP**

4) ENERGY *Short Answer* Which rock is the common product of the metamorphism of shale?

ANSWER: SCHIST

**TOSS-UP**

5) ENERGY *Short Answer* Order the following 4 minerals from lowest to highest absolute hardness.

1: Quartz  
2: Topaz  
3: Fluorite  
4: Calcite

ANSWER: 4, 3, 1, 2

**TOSS UP**

6) ENERGY *Short Answer* What two latitudes are the boundaries of the region we commonly refer to today as the “middle latitutdes”?

ANSWER: 30 N, 50 N

**TOSS-UP**

7) ENERGY *Short Answer* What are the names of the cirrus like paths of condensed vapor produced by jet aircraft flying at high altitudes?

ANSWER: CONTRAILS

**TOSS UP**

8) ENERGY *Short Answer* What is the name of the oceanic phenomenon in which the average movement of surface water down to a depth of about 100 m is at right angles to the surface wind direction?

ANSWER: EKMAN SPIRAL

**TOSS-UP**

9) ENERGY *Short Answer* State by name of number all of the following 4 statements which is or are true of the lighthouse model.

1: A pulsar does not pulse but rather emits beams of radiation that sweep around the sky as the neutron star rotates. 2: The mechanism that produces the beams involves extremely high energies and is not fully understood.  
3: Observers tend to notice only those pulsars whose beams happen to sweep over Earth.  
4: Modern space telescopes observing from above Earth’s atmosphere cannot image details around young neutron stars.

ANSWER: 1, 2 and 3

**TOSS UP**

10) ENERGY *Short Answer* Which theory proposed the idea that changes in the earth’s eccentricity, precession, and obliquity have had a major effect on climate change?

ANSWER: MILANKOVITCH THEORY

**TOSS-UP**

11) ENERGY *Multiple Choice* Which of the following structures is most susceptible to damage by acid precipitation?

W) A granite monument  
X) A slate roof Y) A marble tombstone   
Z) A statue made of gabbro

ANSWER: Y) A MARBLE TOMBSTONE

**TOSS UP**

12) ENERGY *Short Answer* What process, beginning when a star reaches around 100,000,000 K, consists of helium nuclei being fused together into carbon?

ANSWER: TRIPLE ALPHA PROCESS

**TOSS-UP**

13) ENERGY *Short Answer* State by name or number which of the 4 following statements is or are true of Population II stars.  
1: Metal Rich  
2: Belong to the spherical component of the galaxy  
3: Randomly tipped orbits  
4: Relatively young

ANSWER: 2, 3

**TOSS UP**

14) ENERGY *Short Answer* Name the phenomenon which can be described as what occurs when light from a distant object passes a nearby massive object and is deflected by the gravitational field.

ANSWER: GRAVITATIONAL LENSING

**TOSS-UP**

15) ENERGY *Short Answer* Name the type of spiral galaxies which have small, highly luminous nuclei with peculiar spectra.

ANSWER: SEYFERT GALAXIES

**TOSS UP**

16) ENERGY *Short Answer* Which two important descriptions of the universe, when combined, lead to the cosmological principle, which says that any observer in any galaxy sees the same general properties for the universe?

ANSWER: ISOTROPIC, HOMOGENOUS

**TOSS-UP**

17) ENERGY *Multiple Choice* Which moon of Jupiter, with a very high albedo, has very few meteor impacts, leading to the belief that it is only 10 million years old?

W) Ganymede X) Europa  
Y) Io Z) Callisto

ANSWER: X) EUROPA

**TOSS UP**

18) ENERGY *Short Answer* What class of meteorites is characterized by high silica content, resembling Earth’s rocks?

ANSWER: STONY METEORITES

**TOSS-UP**

19) ENERGY *Short Answer* What type of asteroids have albedos less than 0.06, and are probably made of carbon-rich material similar to that in carbonaceous chondrite meteorites?

ANSWER: C-TYPE

**TOSS UP**

20) ENERGY *Short Answer* State by name or number all of the following 3 events which could occur if an asteroid the size of that which wiped out the dinosaurs were to impact.

1: Chemical Changes in ocean and atmosphere

2: Large temperature changes

3: Vaporizes upper 100 m of ocean

ANSWER: 1 and 2

**TOSS-UP**

21) ENERGY *Short Answer* What term refers to the state of gravitational equilibrium between the earth's lithosphere and asthenosphere such that the tectonic plates float at an elevation which depends on their thickness and density?

ANSWER: ISOSTASY

**TOSS UP**

22) ENERGY *Short Answer* What word is used to describe processes which pertain to the activity of the winds and more specifically, to the winds' ability to shape the surface of the Earth and other planets?

ANSWER: AEOLIAN

**TOSS UP**

23) ENERGY *Short Answer* State by name or number all of the following 4 methods of absolute dating which can be used to date something over 100,000 years old.

1: Identification of Magnetic Reversals

2: Dendrochronology

3: Carbon-14 Radioisotopes

4: Uranium/Thorium Radioisotopes

ANSWER: 1 and 4

**TOSS UP**

24) ENERGY *Multiple Choice* The Very Large Array in New Mexico is an example of what type of telescope?

W) Optical  
X) Infrared Y) Radio   
Z) X-Ray

ANSWER: Y) RADIO

**TOSS UP**

25) ENERGY *Short Answer* What is the name of the process in which a glacier freezes on the sides of a valley, and subsequent ice movement pulls away masses of rock?

ANSWER: PLUCKING