Tossup

1) *Biology – Short Answer:* Huntington's disease is characterized by repeats of what 3 nucleotide sequence?

ANSWER: CAG

Tossup

2) *Earth and Space – Multiple Choice:* Which of the following iron minerals is most resistant to chemical weathering?

W) Magnetite
X) Hematite
Y) Goethite
Z) Limonite

ANSWER: X) Hematite

Tossup

3) *Math – Short Answer:* An ellipse has 2 foci at (-3,0) and (3,0) and includes the point (0,4). What is the area of this ellipse?

ANSWER: 20π

Tossup

4) *Physics – Multiple Choice:* A metal plate has a coefficient of linear expansion of 0.006 inverse Kelvins and an original area of 100 square meters**.** The temperature of the plate increases by 5 Kelvins. What is the new area of the plate to the nearest square meter?

W) 101
X) 103
Y) 104
Z) 106

ANSWER: Z

Tossup

5) *Chemistry – Short Answer:* Iodometry is most commonly used to determine the concentration of what types of compounds?

ANSWER: Oxidizing agents (Accept equivalent terms)

Tossup

6) *Biology – Short Answer:* What region of the inner ear is responsible for detecting horizontal acceleration?

ANSWER: Utricle

Tossup

7) *Earth and Space – Short Answer:* Tatooine orbits 3 AU away from a binary star system with masses of 1 solar mass and 3 solar masses. What is its orbital period to the nearest year?

ANSWER: 6

Tossup

8) *Chemistry – Short Answer:* How many radial and angular nodes respectively are contained in a 3d orbital?

ANSWER: 0 and 2

Tossup

9) *Physics – Short Answer:* A spaceship is in orbit with average mechanical energy of -78J. It fires its rockets and increases its average kinetic energy by 34 J. What is the average total mechanical energy in the orbit now?

ANSWER: -112 J

Tossup

10) *Math – Short Answer:* If $a^2 + b = 6$ [a squared plus b equals 6] and $a + b^2 = 7$ [a plus b squared equals 7], then what is the value of $a^2b^2 + a^3 + b^3 + ab$ [a squared times b squared plus a cubed plus b cubed plus a time b]?

ANSWER: 42