Lightning Round 10-2

PHYSICS – MULITPLE CHOICE

Which of the following simple machines is a derivative of the inclined plane?

w. wheel and axle

x. screw

y. lever

z. pulley

Answer: x. screw

CHEMISTRY – SHORT ANSWER

If a molecule has a trigonal bipyramidal electron-pair arrangement and one lone pair, what will the observed geometry be?

Answer: see-saw

BIOLOGY – MULTIPLE CHOICE

Which of the following neurotransmitters is NOT normally affiliated with acting on the sympathetic nervous system?

w. dopamine

x. epinephrine

y. norepinephrine

z. acetylcholine

Answer: z. acetylcholine

ASTRONOMY – SHORT ANSWER

What notable asterism, shaped as a geometric figure, spans exactly 2 constellations?

Answer: Great Square of Pegasus

EARTH SCIENCE – MULTIPLE CHOICE

Which of the following volcanoes is NOT an example of an active stratovolcano?

w. Etna

x. Kilauea

y. Fuji

z. Saint Helens

Answer: x. Kilauea

MATH – SHORT ANSWER

What is the tangent line of the function y=x^2 + 1 at x=1?

Answer: y=2x

GENERAL SCIENCE – SHORT ANSWER

What was the name for the first manned US space program, designed to put a single man into outer space?

Answer: Mercury

PHYSICS – MULTIPLE CHOICE

A 2-kilogram object moving at 5m/s left collides with a stationary 3 kilogram mass. If the 2-kilogram object bounces back at 1m/s to the right, what is the final velocity of 3-kilogram mass?

w. 8/3 m/s, left

x. 4 m/s, left

y. 6 m/s, left

z. 12 m/s, left

Answer: x. 4 m/s, left

CHEMISTRY – SHORT ANSWER

Using the Bronsted-Lowry Acid definition, what is the conjugate base to sulfuric acid?

Answer: HSO4-

BIOLOGY – MULTIPLE CHOICE

Which of the following diseases is caused by a prion?

w. Ebola

x. Parkinson’s Disease

y. Kuru

z. Meningitis

Answer: y. Kuru

ASTRONOMY – MULTIPLE CHOICE

What type of nebula is normally generated when a hot star causes its surrounding gas to radiate, such as in the Orion nebula?

w. emission

x. reflection

y. dark

z. planetary

Answer: w. emission

EARTH SCIENCE – MULTIPLE CHOICE

Which of the following clouds can often be found in the mesosphere of the poles?

w. aurora

x. nacreous

y. noctilucent

z. cirrus

Answer: y. noctilucent

MATH – SHORT ANSWER

What is the area of a triangle with semiperimeter of 8, and side lengths 3,6, and 7? Express in simplest radical form.

Answer: 4sqrt(5)

GENERAL SCIENCE – MULTIPLE CHOICE

In the current distribution of mass-energy of our universe, what class takes up the largest amount?

w. dark energy

x. dark matter

y. baryonic matter

z. antimatter

Answer: w. dark energy

PHYSICS – SHORT ANSWER

A 50 N force keeps a 10 kg body moving at a constant velocity across a surface. Ignoring any other forces, what is the coefficient of friction between the body and the surface?

Answer: 0.5

CHEMISTRY – MULTIPLE CHOICE

Which of the following metal ions has a one-electron standard reduction potential which is positive compared to the standard hydrogen electrode?

w. Mg2+

x. Na+

y. Al3+

z. Cu2+

Answer: z. Cu2+

BIOLOGY – SHORT ANSWER

In glycolysis, phosphofructokinase converts fructose 6-phosphate into what next step?

Answer: fructose 1,6-bisphosphate

ASTRONOMY – MULTIPLE CHOICE

Which of the following constellations has no stars brighter than an apparent magnitude of 1.0?

w. Ursa Minor

x. Orion

y. Bootes

z. Lyra

Answer: w. Ursa Minor

EARTH SCIENCE – SHORT ANSWER

In the Koppen Classification system, what is the specific term for a climate termed Cfa?

Answer: Humid subtropical

MATH – SHORT ANSWER

When rolling 2 dice, what is the probability that the sum is greater than 7?

Answer: 15/36

GENERAL SCIENCE – SHORT ANSWER

In the SI system, what is the unit for absorbed dose of radiation, which is equivalent to J/kg?

Answer: gray

PHYSICS – MULTIPLE CHOICE

In a charging parallel-plate capacitor, where is the energy from the power source being stored?

w. In the plates themselves as charge

x. As the voltage difference in the leads of the wires hooking up the plates

y. In the electric field between the plates

z. Charging capacitors do not store energy

Answer: y. In the electric field between the plates

CHEMISTRY – SHORT ANSWER

What colorless, volatile, and extremely explosive liquid at standard conditions was first isolated in 1890 by Theodor Curtius, has a chemical formula of HN3, and is primarily used for the preservation of stock solutions and as a reagent?

Answer: hydrazoic acid (accept: hydrogen azide, azoimide)

BIOLOGY – SHORT ANSWER

What is the term for a microorganism that requires oxygen to survive, but at lower levels than normal atmospheric conditions and higher levels of carbon dioxide, like helicobacter pylori?

Answer: microaerophile

ASTRONOMY – MULTIPLE CHOICE

Which of the following stars has an absolute magnitude which is higher, in other words, dimmer, than its apparent magnitude?

w. Betelgeuse

x. Procyon

y. Regulus

z. Polaris

Answer: x. Procyon